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Staff Assessment and
Draft Environmental Impact Statement
and
Draft California Desert Conservation Area Plan Amendment

SES SOLAR TWO PROJECT

Application For Certification (08-AFC-5)
Imperial County

U.S. BUREAU OF LAND MANAGEMENT
and
CALIFORNIA ENERGY COMMISSION

STAFF ASSESSMENT - DRAFT ENVIRONMENTAL IMPACT STATEMENT

FEBRUARY 2010
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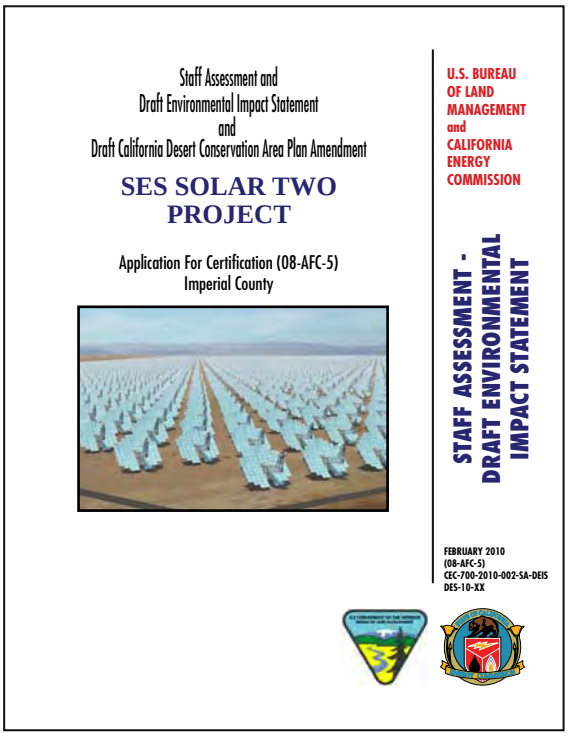

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STAFF ASSESSMENT AND DRAFT ENVIRONMENTAL IMPACT STATEMENT AND DRAFT CALIFORNIA DESERT CONSERVATION AREA PLAN AMENDMENT

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EXECUTIVE SUMMARY

Jim Stobaugh and Christopher Meyer

INTRODUCTION

Stirling Energy Systems Solar Two, LLC (SES Solar Two, LLC or applicant) is seeking approval to construct and operate the Stirling Energy Systems Solar Two Project and its ancillary facilities (SES Solar Two Project). The applicant is a private party that is a wholly owned subsidiary of Tessera Solar. The main objective of the SES Solar Two Project is to provide clean, renewable, solar-powered electricity to the State of California. The electricity from the SES Solar Two Project will assist the State in meeting its objectives as mandated by the California Renewable Portfolio Standard (RPS) Program and the California Global Warming Solutions Act. The SES Solar Two Project will also address other local mandates adopted by California's electric utilities for the provision of renewable energy.

San Diego Gas & Electric (SDG&E) selected the SES Solar Two Project to help meet its objectives under the legislative requirements of the RPS Program through a least-cost, best-fit competitive solicitation. Because the SES Solar Two Project is one of the three projects that SDG&E selected from the solicitation, the applicant and SDG&E entered into a 20-year Power Purchase Agreement (PPA) for the provision of renewable electricity. This PPA will help SDG&E meet both its statutory mandate to purchase at least 20%of its electric power from renewable resources by 2010 and its future electricity requirements. The California Public Utilities Commission approved the PPA on December 1, 2005. The SES Solar Two Project represents approximately 44% of SDG&E's RPS goals.

The applicant has submitted an Application for Certification (AFC) to the California Energy Commission (Energy Commission) for the proposed project. The Energy Commission is the lead State agency responsible for evaluating the environmental effects of project and for complying with the California Environmental Quality Act (CEQA) for project related discretionary actions by the Energy Commission. The project proposes the use of land managed by the United States Department of the Interior, Bureau of Land Management (BLM), therefore the applicant has submitted a request for a right-of-way grant to the BLM. The BLM is the federal lead agency for the evaluation of project effects and compliance of the proposed project with the requirements of the National Environmental Policy Act (NEPA) related to possible BLM discretionary actions related to the right-of-way grant request.

PROPOSED PROJECT

Project Location and Description

The applicant intends to develop an electric-generating facility with a nominal capacity of 750 megawatts (MW) using concentrated solar power. The SES Solar Two Project would be constructed on an approximately 6,500-acre (just over 10 square miles) site in the Imperial Valley in Imperial County, California. The site is approximately 100 miles east of San Diego, 14 miles west of El Centro, and 4 miles east of Ocotillo Wells. The

SES Solar Two site is predominantly comprised of BLM managed lands with some private parcels within the approximately 6,500 acre site. Key features of the proposed project are described briefly below and in more detail in the following sections:

The electric-generating facility will include the construction of a new 230-kilovolt (kV) substation approximately in the center of the project site, an operation and administration building, a maintenance building, and a substation building.

The SES Solar Two Project will be constructed in two phases: Phase I will consist of up to 12,000 SunCatchers configured in 200 1.5-MW solar groups of 60 SunCatchers per group. The total net nominal generating capacity of Phase 1 is 300 MW. Phase I will require approximately 2,600 acres. The renewable energy from Phase I will be transmitted via the existing 500-kV SDG&E Southwest Powerlink transmission line. The SES Solar Two Project will be connected to the grid at the SDG&E Imperial Valley Substation via a 10.3-mi long, 230-kV interconnection transmission line that will be constructed as part of the project in a corridor parallel to the existing Southwest Powerlink transmission line.

Phase II will expand the SES Solar Two Project to a total of 30,000 SunCatchers configured in 500-1.5-MW solar groups with a total net generating capacity of both phases of 750 MW. Phase II will require approximately 3,500 ac of the project site. The 450-MW Phase II will consist of approximately 18,000 SunCatchers. The additional 450 MW generated in Phase II will require new transmission capacity within the grid. This is anticipated to be provided by the proposed 500-kV Sunrise Powerlink (or equivalent) transmission line (assumed be a project independent of the SES Solar Two Project). The construction and operation of Phase II is contingent on the development of either the Sunrise Powerlink transmission line or additional transmission capacity in the SDG&E transmission system.

Solar Power Plant Equipment and Facilities

The SES Solar Two Project will use the proprietary SunCatcher technology. Each SunCatcher consists of a 25-kilowatt (kW) solar power generating system. The system is designed to track the sun automatically and to focus solar energy onto a Power Conversion Unit (PCU), which will generate electricity. The system consists of an approximately 38-foot diameter solar concentrator dish that supports an array of curved glass mirror facets. These mirrors will collect and focus solar energy onto the heat exchanger of the PCU. The PCU will convert the solar thermal energy into electricity via a Solar Stirling Engine designed to convert solar power to rotary power through a thermal conversion process. Each SunCatcher will operate independently and will generate grid-quality electricity. Power generated by groups of 60 SunCatchers will be collected through a 600-volt (V) underground power collection system. This collection system will combine the output from the units and connect each 1.5-MW group to a generator step-up unit (GSU) transformer with an output voltage of 34.5 kilovolt (kV). The output from the GSUs will be grouped into 3-, 6-, and 9-MW groups, which will be connected via 34.5-kV underground collection circuits to 48- or 51- MW, 34.5-kV overhead collection circuits, each of which will be connected directly to the on-site collection substation. The on-site collection substation will be connected via a 230-kV, double-circuit overhead interconnection transmission line for delivery of generated

electricity to the SDG&E Imperial Valley Substation, where the interconnection to the California Independent System Operator (California ISO)-controlled grid will take place.

The SES Solar Two Project includes construction and operation of an on-site substation, which will include transformers, circuit breakers, metering, and other protection required to connect the project to the SDG&E Imperial Valley Substation. The SES Solar Two Project interconnect transmission system will require construction of approximately 10.3 mi of double-circuit 230-kV transmission line to transmit the electricity generated on the project site to the SDG&E transmission facilities.

Related permanent facilities on the project site will include a Main Services Complex, which will be in a central location on site to provide for efficient access routes for maintenance vehicles servicing the SunCatcher solar field. The Main Services Complex will include the following:

Operation and Administration Building. The project administration offices and personnel facilities will be in this one-story building. This building will also contain meeting and training rooms, engineering offices, a visitor's room, and support services. The project maintenance facilities, shop, and warehouse storage will be adjacent to the operation and administration building.

Maintenance Building. The maintenance building will 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.

Water Treatment System. The water treatment structure will be northeast 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 wastewater containment will be north of the water treatment structure.

Yard Tanks. The yard tanks will be at-grade steel tank reservoirs and/or polyethylene tanks. The water treatment system will include a raw water tank with a permanent booster pump station, a potable water treatment system, ground-set steel or polyethylene potable water and a fire water storage tank, a booster pump station to accommodate potable water needs and fire-flow requirements, a disinfection system, a demineralized water treatment system for mirror washing water, a polyethylene storage tank for demineralized water storage, chemical storage, reject water and sludge disposal and evaporation ponds, and various support piping, valves, and miscellaneous equipment to support the system. All tanks, foundations, and piping connections will be designed and constructed to the appropriate standards for contents and seismic zone considerations.

Control Building. The control building will be near the substation. This building will contain relay and control systems for the substation and the operations control room.

Utilities and Services for Ancillary Facilities and Structures. A diesel powered fire water pump and a diesel operated standby power generator will be adjacent to the operation

and administration building. Electric service for the Main Services Complex will be obtained from Imperial Irrigation District (IID). Electric power will be provided via overhead service from an IID overhead distribution line located on the north side of Evan Hewes Highway. Communications service for the Main Services Complex will be obtained from L3 Communications Holdings, Inc. Communications service will be provided via an overhead service from existing underground communications lines located on the north side of the railroad located south of Evan Hewes Highway

Construction Logistics Area

The applicant proposes using a temporary construction logistics area for staging contractor equipment and trailers, assembly yards, storage of materials, equipment laydown and wash area, construction personnel parking, and assembly areas for SunCatchers. The temporary facilities and structures in that construction logistics area will be:

Assembly Buildings. SunCatcher assembly will be performed in three temporary assembly buildings in the construction logistics area. These buildings will be removed after all the SunCatchers are assembled and installed. The three assembly buildings will be beside the Main Services Complex.

Transport trailer storage. Storage for trailers will be provided south of the assembly buildings in a storage facility that will accommodate 75 to 100 trailers, maintaining a 3 to 5 day inventory of SunCatcher parts during the assembly phase. These trailers will be removed and salvaged after all the SunCatchers are installed.

Laydown Areas. Two laydown areas will be provided: one on approximately 100 ac east of Dunaway Road and north of I-8, and the second on approximately 11 ac immediately south of the Main Services Complex.

Construction of the SES Solar Two Project is expected to begin in early 2010 and will take approximately 44 months for full project completion. However, renewable power from the project will come online much earlier than 44 months after the start of the project. As groups of SunCatchers are constructed and become operational, their renewable power will immediately be supplied to the grid.

Water Supply and Discharge

The proposed water source for the washing the SunCatcher mirrors is reclaimed water from the Seeley Waste Water Treatment Facility (SWWTF). Upgrades to the existing treatment plant so its effluent meets Title 22 requirements for recycled water are being funded by the applicant. SES Solar Two, LLC will have access to at least approximately 150,000 gallons (gal) and up to 200,000 gal of reclaimed water per day for use in all construction and operation activities. To access the reclaimed water, approximately 11.8 miles of water pipeline would be constructed as part of the SES Solar Two Project, extending from the SWWTF to the project’s proposed water treatment plant, via the Evan Hewes Highway right of way (ROW).

Potable water will be delivered to the site by truck and stored in a 5,000 gal tank in the water treatment area. This tank will be able to provide a two to three day supply of potable water for the operating facility.

Fire Protection

The Main Services Complex will include an approximately 175,000-gal tank for water for mirror washing and fire suppression and control. Portable fire extinguishers will be located at strategic locations throughout the site. The fixed fire protection system will provide a wet, water-based sprinkler fire suppression system for the buildings. Employees will be given fire safety training, including instruction in fire prevention, the use of portable fire extinguishers and hose stations, and the reporting of fires to the local fire department.

Access Roads and Maintenance Paths

Approximately 27 miles of paved arterial roads, 14 miles of unpaved perimeter roads, and approximately 234 miles of unpaved access routes would be constructed on the SES Solar Two Project site. Site access during the construction phase would be provided from Dunaway Road, which has an existing interchange from I-8 at the southeastern corner of the site.

Site Security and Fencing (During Construction and Operations)

The 6,500 acre project site would be fenced, excluding the private parcels of land designated as not a part of the project. Access to the federal land managed by the BLM would be authorized under a ROW grant. Operations site security would consist of controlled access gates, perimeter security fencing, twenty-four hour site security monitoring via closed-circuit television and intercom, and regular vehicular patrols. Construction security would consist of fencing installed around the perimeter of the project site at the start of construction, and gated entrances and exits.

Stormwater Management Approach

A stormwater drainage system designed to match existing drainage patterns and meeting all local regulations would collect and direct all rainwater on he project site, managing the flow through the use of existing dry washes, swales, ditches, culverts, and site grading to the pre-development site discharge locations. Erosion and sedimentation controls would be implemented during construction to retain sediment on site and to prevent violations of water quality standards. These actions would be taken in accordance with project specific Best Management Practices (BMPs). A Storm Water Pollution Prevention Plan (SWPPP) would be prepared to conform to State Water Resource Control Board Order Number 99-08-DWQ, General Permit Number CAS000002. Site drainage during construction would follow pre-development flow patterns, with ultimate discharge to Dunaway Road at the northeastern property boundary. Low-flow culverts consisting of a small diameter storm drain with a perforated stem pipe would be installed for sediment control and to provide for storm peak attenuation.

Facility Operation and Maintenance

The SES Solar Two Project would be an “as-available” resource. Therefore, the project would operate anywhere between a minimum of approximately 18 MW net when the first units are interconnected to the grid during the construction period to 750 MW on completion of construction. The capability for independent operation of all 30,000 units

would give maximum flexibility in operations. The SES Solar Two Project is expected to have an annual availability of 99%.

The SES Solar Two Project would operate approximately 3,500 hours annually. The number of available operating hours would depend on the availability of the sun's energy at greater than 250 watts per square meter. SunCatchers would be unable to generate electricity when the sun's energy is below 250 watts per square meter in the early morning or late evening hours and when cloud cover limits the sun's energy for power generation. Also, SunCatchers would be unable to generate electricity during daylight hours when the wind speed exceeds 35 miles per hour (mph), as SunCatchers would be stowed in a safe de-track position at and above this wind speed to prevent damage. It is expected that the SES Solar Two Project would be operated with a staff of approximately 164 full-time employees. The project would operate 7 days per week, generating electricity during daylight hours when 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. Maintenance activities would include SunCatcher mirror washing. The daily average water requirement for SunCatcher mirror washing under regular maintenance routines would be approximately 10.4 gal of raw water per minute.

Waste Management

Wastewater generated at the Main Services Complex would be discharged into a septic system with sanitary leach fields, and would be designed in accordance with applicable Laws, Ordinances, Regulations, and Standards (LORS), including those of the County, the RWQCB, and the California Department of Health Services. Disposal of clear liquids would be conveyed to on-site sanitary leach fields, and sewer sludge would be pumped and disposed of by trucks to an approved offsite disposal facility.

Solid waste from the SES Solar Two Project water treatment system would be trucked to an appropriate off-site landfill from evaporation ponds as a non-hazardous, low-moisture cake. An estimated 60,000 pounds (lbs) per year of salt cake would be trucked off-site to an appropriate landfill or recycled. The full 60,000 lbs would be scheduled for removal at the end of the evaporation process. Approximately 1.5 loads would be required per year.

Non-hazardous wastes generated during construction and operation includes scrap wood, concrete, steel/metal, paper, glass, scrap metals and plastic waste. All non-hazardous wastes would be recycled to the extent possible and non-recyclable wastes would be collected by a licensed hauler and disposed in a Class III solid waste disposal facility. Hazardous wastes would be recycled to the extent possible and disposed in either a Class I or II waste facility as appropriate. All operational wastes produced at SES Solar Two would be properly collected, treated (if necessary), and disposed of at either a Class I or II waste facility as appropriate.

Hazardous materials used during facility construction and operations would include paints, epoxies, grease, transformer oil, and caustic electrolytes (battery fluid). Several methods would be used to properly manage and dispose of hazardous materials and wastes. A Hazardous Materials Management Program (HMMP) would be developed and implemented during the project construction and operation phases. At a minimum, the HMMP would include procedures for hazardous materials handling, use and

storage; emergency response; spill control and prevention; employee training; and recordkeeping and reporting.

Project Decommissioning

Project closure can be temporary or permanent. Temporary closure is defined as a shutdown for a period exceeding the time required for normal maintenance, including closure for overhaul or replacement of the major components, such as major transformers, switchgear, etc. 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.

In the unforeseen event that the SES Solar Two Project is temporarily closed, a contingency plan for the temporary cessation of operations would be implemented. The contingency plan would 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.

The planned life of the SES Solar Two Project is 40 years; however, if the SES Solar Two Project is still economically viable, it could be operated longer. It is also possible that the SES Solar Two Project could become economically noncompetitive before 40 years have passed, resulting in early decommissioning. When the SES Solar Two Project is permanently closed, all the project equipment, facilities, structures and appurtenant facilities must be removed from the site. 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 in a detailed decommissioning plan prior to the planned permanent decommissioning.

ALTERNATIVES

In addition to the proposed SES Solar Two Project, three other Build Alternatives on the same general site and three No Project/No Action Alternatives are also evaluated in detail in this environmental document. Executive Summary Table -1 summarizes the acreages and MW production of the build alternatives and Executive Summary Table -2 describes the three No Project/No Action Alternatives. The three build alternatives are a 300 MW alternative, and two alternatives that would reduce effects to waters of the United States (Drainage Avoidance Alternatives 1 and 2). The No Project/No Action Alternatives all consider not approving the SES Solar Two Project and either amending or not amending the California Desert Conservation Plan (CDCA) regarding land use designations for the site.

Executive Summary Table 1 - Summary of the Build Alternatives

Build Alternative	Number of Megawatts	Number of Acres (approx.)	Number of SunCatchers
SES Solar Two Project	750	6,500	30,000
300 MW Alternative: proposes construction and operation of a 300 MW facility using the SunCatcher technology. On and off site facilities would be similar to the Solar Two Project, except supporting 300 MW of a generation capacity instead of 750 MW.	300	2,600	12,000
Drainage Avoidance #1: This Alternative was developed to reduce impacts to waters of the U.S. on the project site. It would prohibit permanent impacts within the 10 primary drainages on the project site. This alternative would have the same site boundary and SunCatcher technology as the Solar Two Project.	632	4,690 (reduced from 6,500 because it prohibits installation of SunCatchers in 10 primary drainages)	25,000
Drainage Avoidance #2: This Alternative 2 would remove the easternmost and westernmost parts of the project site from development. These areas are where the largest drainage complexes are located. In this alternative, permanent structures would be allowed within all drainages inside the reduced site boundaries.	423	3,153 (reduced from 6,500 because it prohibits installation of SunCatchers in eastern and western parts of the site)	16,915

Executive Summary Table 2 - No Project/No Action Alternatives

No Project/No Action Alternative	SES Solar Two Project?	Amendment to the CDCA Plan?
No Approval of the SES Solar Two Project and no CDCA Plan Amendment	SES Solar Two not approved: no solar energy power generation project would be constructed on the project site	No CDCA Plan Amendment: BLM would continue to manage the site consistent with the existing land use designation in the CDCA Plan for the site
No Approval of the SES Solar Two Project and Amendment of the CDCA Plan to Allow Solar Energy Power Generation Projects on the Project Site	SES Solar Two not approved: solar energy power generation projects could be constructed on the site (as a result of the CDCA Plan amendment)	Yes: BLM would amend Uthe CDCA Plan to allow for solar energy power generation projects on the site
No Approval of the SES Solar Two Project and BLM Amends the CDCA Plan to Not Allow Any Solar Energy Power Generation Projects on the Project Site	SES Solar Two not approved: no solar energy power generation projects could be constructed on the site (as a result of the CDCA Plan amendment)	Yes: BLM would amend the CDCA Plan to not allow any solar energy power generation projects on the project site

COMPARISON OF THE ALTERNATIVES

Executive Summary Table 3 describes the ability of the SES Solar Two Project, the three build alternatives, and the three No Project/No Action Alternatives to meet the defined project purpose and objectives.

Executive Summary Table 3 - ALTERNATIVES TABLE
Ability of the Alternatives to Meet the Project Purpose and Objectives and Site Criteria

Project Purpose and Objectives	SES Solar Two Project	300 MW Alternative	Drainage Avoidance Alternative #1	Drainage Avoidance Alternative #2	No Approval of the Solar Two Project and no CDCA Plan Amendment	No Approval of the SES Solar Two Project and Amendment of the CDCA Plan to Allow Solar Energy Power Generation Projects on the Project Site	No Approval of the Solar Two Project and BLM Amends the CDCA Plan to Not Allow Any Solar Energy Power Generation Projects on the Project Site
To provide clean, renewable, solar-powered electricity and to assist San Diego Gas & Electric (SDG&E) in meeting its obligations under California's Renewable Portfolio Standard Program (RPS)	Yes	Yes	Yes	Yes	No	Potentially	No
To assist SDG&E in reducing its greenhouse gas emissions as required by the California Global Warming Solutions Act	Yes	Yes	Yes	Yes	No	Potentially	No
Provide up to 750 MW of renewable electric capacity under a 20-year PPA to SDG&E	Yes	No	No	No	No	Potentially	No
Contribute to the 20% renewables RPS target set by California's governor and legislature	Yes	Yes	Yes	Yes	No	Potentially	No
Assist in reducing greenhouse gas emissions from the electricity sector	Yes	Yes	Yes	Yes	No	Potentially	No

Project Purpose and Objectives	SES Solar Two Project	300 MW Alternative	Drainage Avoidance Alternative #1	Drainage Avoidance Alternative #2	No Approval of the Solar Two Project and no CDCA Plan Amendment	No Approval of the SES Solar Two Project and Amendment of the CDCA Plan to Allow Solar Energy Power Generation Projects on the Project Site	No Approval of the Solar Two Project and BLM Amends the CDCA Plan to Not Allow An Solar Energy Power Generation Projects on the Project Site
Contribute to California's future electric power needs	Yes	Yes	Yes	Yes	No	Potentially	No
Assist the California Independent System Operator (CAISO) in meeting its strategic goals for the integration of renewable resources, as listed in its Five-Year Strategic Plan for 2008–2012 (CAISO 2007)	Yes	Yes	Yes	Yes	No	Potentially	No
To construct and operate a 750 MW renewable power generating facility in California capable of selling competitively priced renewable energy consistent with the needs of California utilities	Yes	No	No	No	No	Potentially	No
To locate the facility in areas of high solarity with ground slope of less than 5%	Yes	Yes	Yes	Yes	No	Potentially	No

PUBLIC AND AGENCY COORDINATION

The Energy Commission's CEQA-equivalent process and the BLM's NEPA process provide opportunities for the public and other agencies to participate and consult in the scoping of the environmental analysis, and in the evaluation of the technical analyses and conclusions of that analysis. The following subsections describe the status of these outreach efforts for the proposed SES Solar Two Project. These activities are also described in the *Final Scoping Report* (LSA Associates, Inc., September 2009).

AGENCY COORDINATION

The Energy Commission certification is in lieu of any permit required by state, regional, or local agencies and by federal agencies to the extent permitted by federal law (Public Resources Code, Section 25500). However, both 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 following paragraphs describe the agency coordination that has occurred through this joint SA/EIS process for the proposed SES Solar Two Project.

United States Army Corps of Engineers

The United States Army Corps of Engineers (USACE) has jurisdiction to protect water quality and wetland resources under Section 404 of the Clean Water Act. Under that authority, USACE reviews proposed projects to determine whether they may impact such resources, and/or be subject to the requirements for a Section 404 permit. Throughout the SA/DEIS process, the Energy Commission, BLM, and the Applicant have provided information to the USACE to assist them in making a determination regarding their jurisdiction and need for a Section 404 permit. In addition, the USACE has requested that it be included as a cooperating agency with the BLM on the NEPA EIS for the project.

United States Fish and Wildlife Service

The United States Fish and Wildlife Service (USFWS) has jurisdiction to protect threatened and endangered species under the federal Endangered Species Act (ESA). Formal consultation with the USFWS under Section 7 of the ESA is required for any federal action that may adversely affect a federally-listed species. The site is known to be occupied by FTHL. The FTHL is currently not listed as threatened or endangered, but is proposed for listing as threatened.

State Water Resources Control Board/Regional Water Quality Control Board

The Regional Water Quality Control Board (RWQCB) has the authority to protect surface water and groundwater. Throughout the SA/DEIS process, the Energy Commission, BLM, and the applicant have invited the RWQCB to participate in public scoping and workshops, and have provided information to assist the agency in evaluating the potential impacts and permitting requirements of the proposed project.

California Department of Fish and Game

The California Department of Fish and Game (CDFG) have the authority to protect water resources through regulation of modifications to streambeds, under Section 1602 of the Fish and Game Code. The Energy Commission, BLM, and the applicant have provided information to CDFG to assist in their determination of the impacts to streambeds, and identification of permit and mitigation requirements. CDFG also has the authority to regulate potential impacts to species that are protected under the California Endangered Species Act (CESA).

Imperial County

The SES Solar Two Project site occupies approximately 360 acres of private land under the jurisdiction of Imperial County (County). The Energy Commission and BLM provided opportunities during scoping for the County to provide input to the environmental technical studies for the project.

Public Coordination

The Energy Commission's CEQA-equivalent process and the BLM's NEPA process provide opportunities for public participation in the scoping of the environmental analysis, and in the evaluation of the technical analyses and conclusions of that analysis. For the Energy Commission, this outreach program is primarily facilitated by the Public Adviser's Office (PAO). As part of the coordination of the environmental review process required under the Energy Commission /BLM California Desert District MOU, the agencies have jointly held public meetings and workshops which accomplish the public coordination objectives of both agencies.

The PAO's public outreach is an integral part of the Energy Commission's AFC review process. The PAO reviewed information provided by the applicant and also conducted its own outreach efforts to identify and locate local elected and certain appointed officials, as well as "sensitive receptors" (including schools, community, cultural and health facilities and daycare and senior-care centers, as well as environmental and ethnic organizations). Those agencies and individuals that provided comments concerning the project have been considered in staff's analysis. This SA/DEIS provides agencies and the public with an opportunity to review the Energy Commission staff's analysis of the proposed project. Comments received on this SA/DEIS would be taken into consideration in preparing the subsequent project documents, including the Supplemental SA/Final EIS (SSA/FEIS).

The AFC, this SA/DEIS, and other project documents are located on the Energy Commission's website at http://www.energy.ca.gov/sitingcases/solartwo/index.html

STAFF'S ASSESSMENT

Each technical area section of this SA/DEIS contains a discussion of the project setting, impacts, and where appropriate, mitigation measures and conditions of certification. The SA/DEIS includes the staff's assessment of:

- the environmental setting of the proposal;

- impacts on public health and safety, and measures proposed to mitigate these impacts;
- environmental impacts, and measures proposed to mitigate these impacts;
- the engineering design of the proposed facility, and engineering measures proposed to ensure the project can be constructed and operated safely and reliably;
- project closure;
- project alternatives;
- compliance of the project with all applicable laws, ordinances, regulations and standards (LORS) during construction and operation;
- environmental justice for minority and low income populations, when appropriate; and
- proposed mitigation measures/conditions of certification.

SUMMARY OF PROJECT RELATED IMPACTS

Executive Summary Table 4 summarizes the potential short-term, long-term and cumulative adverse impacts of the proposed SES Solar Two Project, the anticipated mitigation and conditions of certification, and the level of significance of the impacts after mitigation, under CEQA.

Executive Summary Table 4
Summary of Potential Short-Term, Long-Term, and Cumulative Adverse Impacts

Environmental Parameter	Complies with Applicable LORS	Short and Long Term Adverse Impacts	Cumulative Adverse Impacts	Mitigation and Conditions of Certification	CEQA Level of Significance After Mitigation
Air Quality	Yes	No significant short term or long term adverse impacts with mitigation/ Conditions of Certification incorporated	No cumulative adverse impacts	**AQ-1** through **AQ-31 and AQ-SC1** through **AQ-SC7**	Less than significant
Biological Resources	Yes	No significant short term or long term adverse impacts with mitigation/ Conditions of Certification incorporated	No cumulative adverse impacts	**BIO-1** through **-17**	Unknown
Cultural Resources	Yes	To Be Provided	No cumulative adverse impacts	**CUL-1**	Less than significant
Facility Design	Yes	No significant short term or long term adverse impacts with mitigation/ Conditions of Certification incorporated	Not applicable	General Conditions	Less than significant

Environmental Parameter	Complies with Applicable LORS	Short and Long Term Adverse Impacts	Cumulative Adverse Impacts	Mitigation and Conditions of Certification	CEQA Level of Significance After Mitigation
Geology, Paleontology, and Minerals	Yes	No significant short term or long term adverse impacts with mitigation/ Conditions of Certification incorporated	No cumulative adverse impacts	**PAL-1** through -**7**. and **GEN-1, GEN-5,** and **CIVIL-1**	Less than significant
Hazardous Materials	Yes	No significant short term or long term adverse impacts with mitigation/ Conditions of Certification incorporated	No cumulative adverse impacts	**HAZ-1** through **-6**	Less than significant
Hydrology, Soils and Water Resources	Yes	No significant short term or long term adverse impacts with mitigation/ Conditions of Certification incorporated	No cumulative adverse impacts	**SOIL&WATER -1** through **-9**	Less than significant
Land Use and Recreation	**No**	Significant short term and long term adverse impacts reduced with mitigation/ Conditions of Certification incorporated	Could result in cumulative adverse impacts	**LAND-1** and **-2**	Less than significant
Noise	Yes	No significant short term or long term adverse impacts with mitigation/ Conditions of Certification incorporated	No cumulative adverse impacts	**NOISE-1** through **-6**	Less than significant
Public Health and Safety	Yes	No significant short term or long term adverse impacts with mitigation/ Conditions of Certification incorporated	No cumulative adverse impacts	None required	Less than significant

Environmental Parameter	Complies with Applicable LORS	Short and Long Term Adverse Impacts	Cumulative Adverse Impacts	Mitigation and Conditions of Certification	CEQA Level of Significance After Mitigation
Power Plant Efficiency	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Power Plant Reliability	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Socioeconomics and Environmental Justice	Yes	No significant short term or long term adverse impacts with mitigation/ Conditions of Certification incorporated	No cumulative adverse impacts	None required	Less than significant
Traffic and Transportation	Yes	No significant short term or long term adverse impacts with mitigation/ Conditions of Certification incorporated	No cumulative adverse impacts	**TRANS-1** through **-4**	Less than significant
Transmission Line Safety/ Nuisance	Yes	No significant short term or long term adverse impacts with mitigation/ Conditions of Certification incorporated	No cumulative adverse impacts		Less than significant
Transmission System Engineering	Yes	No significant short term or long term adverse impacts with mitigation/ Conditions of Certification incorporated	No cumulative adverse impacts		Less than significant
Visual Resources	**No**	Would result in significant short term (construction) and long term (operation) adverse impacts.	Could result in cumulative adverse impacts	**VIS-1** through **-7**	Significant and unavoidable

Environmental Parameter	Complies with Applicable LORS	Short and Long Term Adverse Impacts	Cumulative Adverse Impacts	Mitigation and Conditions of Certification	CEQA Level of Significance After Mitigation
Waste Management	Yes	No significant short term or long term adverse impacts with mitigation/ Conditions of Certification incorporated	No cumulative adverse impacts	**WASTE-1** through -**8**	Less than significant
Worker Safety and Fire Protection	Yes	No significant short term or long term adverse impacts with mitigation/ Conditions of Certification incorporated	No cumulative adverse impacts	**WORKER SAFETY -1** through **-6**	Less than significant

Air Quality

BLM and Energy Commission staff find that with the adoption of the mitigation and conditions of certification, the proposed SES Solar Two Project would comply with all applicable LORS, and would not result in significant adverse short and long term or cumulative air quality impacts under CEQA.

With respect to potential impacts on air quality, staff has made the following conclusions about the SES Solar Two Project:

- The project would not have the potential to exceed point source discharge (PSD) emission levels during direct source operation and the facility is not considered a major stationary source. However, without adequate fugitive dust mitigation, the project would have the potential to exceed the General Conformity PM10 applicability threshold during construction and operation and the NOx applicability threshold during construction, and could cause potential localized exceedance of the PM10 NAAQS during construction and operation. Conditions of Certification **AQ-SC1** through **AQ-SC5**, for construction, and **AQ-SC7**, for operation, would adequately mitigate these potentially substantial adverse project air quality impacts.
- The project would comply with applicable Imperial County Air Pollution Control District Rules and Regulations and staff recommends the inclusion of the District's final determination of compliance (FDOC) conditions as Conditions of Certification **AQ-1** through **AQ-31.**
- The project's construction activities would likely contribute to significant CEQA adverse PM10 and ozone impacts. Staff recommends **AQ-SC1** to **AQ-SC5** to mitigate those potential impacts.
- The project's operation would not cause new violations of any NO_2, SO_2, PM2.5 or CO ambient air quality standards. Therefore, the project-direct operational NOx, SOx, PM2.5 and CO emission impacts would not be significant under CEQA
- The project's direct and indirect, or secondary emissions contribution to existing violations of the ozone and PM10 ambient air quality standards are likely to be significant under CEQA if unmitigated. Therefore, staff recommends **AQ-SC6** to mitigate the onsite maintenance vehicle emissions and **AQ-SC7** to mitigate the operating fugitive dust emissions to ensure that the potential ozone and PM10 impacts are mitigated to below a level of significance under CEQA over the life of the project.
- The project would be consistent with the requirements of SB 1368 and the Emission Performance Standard for greenhouse gases.
- The project would be in compliance with air quality LORS.

Alternatives. The CEQA level of significance for the 300 MW Alternative would be the same as for the proposed project, with the same significance rationale, where if left unmitigated there is the potential for significant NOx and PM emission impacts under CEQA during the alternative project's construction and operation. The mitigation that would be proposed for the 300 MW Alternative would be the same as that proposed for

the proposed Solar Two Project (Staff Recommended Conditions **AQ-SC1** TO **AQ-SC8**).

The CEQA level of significance for the Drainage Avoidance #1 Alternative would be the same as for the proposed project, with the same significance rationale, where if left unmitigated there is the potential for significant NOx and PM emission impacts during the Alternative project's construction and operation. The mitigation that would be proposed for the Drainage Avoidance #1 Alternative would be the same as that proposed for the proposed project (staff recommended conditions **AQ-SC1** to **AQ-SC8**).

The CEQA level of significance for the Drainage Avoidance #2 Alternative would be the same as for the proposed project, with the same significance rationale, where if left unmitigated there is the potential for CEQA significant NOx and PM emission impacts during the alternative project's construction and operation. The mitigation that would be proposed for the Drainage Avoidance #2 Alternative would be the same as that proposed for the proposed project (staff recommended conditions **AQ-SC1** to **AQ-SC8**).

The results of the No Project / No Action Alternative would be the following:

- The impacts of the proposed project would not occur. However, the land on which the project is proposed would become available to other uses that are consistent with BLM's land use plan, including another renewable energy project.
- The benefits of the proposed project in reducing fossil fuel use and greenhouse gas emissions from gas-fired generation would not occur. Both State and Federal law support the increased use of renewable power generation.

Biological Resources

BLM and Energy Commission staff find that with the adoption of the mitigation and conditions of certification, the proposed SES Solar Two Project would comply with all applicable LORS, and would not result in significant adverse short and long term or cumulative impacts to biological resources under CEQA.

Overview of Vegetation/Wildlife Impacts: Much of the SES Solar Two Project plant site predominantly consists of Sonoran creosote bush scrub habitat including approximately 1,000 acres of disturbed habitat, and supports a diversity of mammals, birds, and reptiles, including some special status wildlife species, such as FTHL and burrowing owl. Grading on the plant site would not directly or indirectly impact sensitive plant communities or wetlands, but would directly impact some wildlife, and possibly special status plants. The removal of vegetation would result in the loss of cover, foraging, and breeding habitat. Construction of linear facilities also has potential for impacts to wildlife; transmission line construction south of Interstate 8 would impact approximately 92.8 acres of Sonoran creosote bush scrub, which provides habitat for FTHL. Construction of the 12-mile reclaimed water pipeline would occur within the disturbed road shoulder, but nevertheless has potential to impact special status species such as burrowing owl and FTHL. Potential direct and indirect construction impacts to vegetation and wildlife can be reduced to less than significant levels under CEQA with avoidance and minimization measures described in staff's proposed Conditions of Certification **BIO-1** through **BIO-8**.

Take of Listed Species: The project is not likely to result in adverse effects to federally list as threatened or endangered species. The only federally listed species observed on the site was Peninsular bighorn sheep, federally listed as endangered. Several Peninsular bighorn sheep were observed in March 2009 on the site. The occurrence of Peninsular bighorn sheep on the site is considered a transient occurrence. The site is several miles from designated critical habitat and does not provide any corridor to other habitat that would support Peninsular bighorn sheep. The FTHL is not currently listed as federally threatened or endangered. However, there is a proposal for listing of the FTHL. Potential take of FTHL and loss of habitat for these species would be fully mitigated with staff's proposed Conditions of Certification **BIO-9** through **BIO-11**. Staff's proposed Condition of Certification **BIO-10** requires compensatory mitigation for approximately 6,619.9 acres of habitat suitable for these listed species, as directed by the FTHL Rangewide Management Strategy (2003). The other two conditions require avoidance and minimization measures and compliance verification. It is currently unresolved as to the disposition of the FTHLs that are salvaged from construction activity other than to keep the lizards out of harm's way. The FTHL Interagency Coordinating Committee (ICC) would need to coordinate the disposition of the salvaged FTHL individuals. Possible outcomes of the salvaged FTHL may include relocation to several suitable FTHL habitats and/or conducting research, though this is currently unresolved. It is unknown when the FTHL ICC would come to a decision as to what course of action(s) would be taken with the salvaged lizards. Once the FTHL ICC determines what would be done to the salvaged FTHLs, the requirements would be incorporated into staff's proposed Condition of Certification **BIO-9**.

Avian Predation on FTHL: Construction and operation of the project could provide attractants in the form of new nesting sites, trash, and water, which draw unnaturally high numbers of FTHL predators such as the common raven, American kestrel, and loggerhead shrike. Increased avian predation could contribute to the cumulative CEQA significant impacts to the FTHL. Staff's proposed Condition of Certification **BIO-12** specifies that the applicant finalize their draft Raven Management and Monitoring Plan in consultation with staff, BLM, CDFG, and USFWS. Staff anticipates that the applicant would be able to produce a final plan well before licensing, and that implementation of the condition would reduce this impact to less than significant levels under CEQA.

Migratory Birds/Burrowing Mammals: Vegetation at the plant site and along linear facilities provides foraging, cover, and/or breeding habitat for migratory birds, including a number of special status bird species confirmed to be present at the site (western burrowing owl, loggerhead shrike, LeConte's thrasher, and California horned lark). Migratory birds and their eggs and young are protected by the federal Migratory Bird Treaty Act and Fish and Game Code section 3503. Staff's proposed Conditions of Certification **BIO-8** (Impact Avoidance and Minimization Measures) and **BIO-14** (Pre-construction Nest Surveys and Impact Avoidance Measures) would avoid these potentially significant impacts to nesting birds under CEQA. Potential impacts to burrowing owls would be further mitigated under CEQA by implementation of staff's proposed Condition of Certification **BIO-16**. This condition would require active relocation of burrowing owls in the path of construction. Implementation of BIO-8, BIO-14, and BIO-16 wound ensure compliance with the MBTA.

American badgers were not detected during the surveys, but potential habitat is present for this species at the project site. Construction activities could also crush or entomb American badger, which are protected under Title 14, California Code of Regulations (sections 670.2 and 670.5). Staff's proposed Condition of Certification **BIO-15**, which requires preconstruction surveys and avoidance measures to protect badgers and kit fox, would avoid this potential impact. This condition also protects desert kit fox, which are known to occur on the site, and which are protected under the California Code of Regulations Chapter 5 Section 460.

Special Status Plants: Though no special status plants were observed during surveys, the surveys were deemed to be inadequate by staff. Federally threatened or endangered plant species are not expected to occur onsite. Four special status plant species were not included in targeted surveys. Staff and BLM are concerned that special status plant species may have been overlooked due to half the surveys conducted concurrently with FTHL surveys with biologists of varying levels of botanical expertise and the lack of fall surveys after late summer/early fall monsoonal rains. Staff's proposed Conditions of Certification **BIO-8** and **BIO-18** (Noxious Weed Management Plan) would minimize potentially significant impacts under CEQA to special status plants. Potential impacts to special status plants would be further mitigated by staff's proposed Condition of Certification **BIO-19** (Special Status Plant Surveys and Protection Plan). This condition requires targeted surveys during the appropriate seasons in 2010 and a protection plan for special status species.

Threat to Migratory Birds from Evaporation Ponds: The SES Solar Two Project includes two evaporation ponds totaling 2 acres in area. Staff and CDFG are concerned that the proposed ponds could attract avian predators, which in turn prey on the FTHL, and could also harm waterfowl, shorebirds, and other resident or migratory birds due to hyper-saline conditions. The applicant has addressed these concerns by proposing quarterly monitoring of the evaporation pond water. If toxicity effects on wildlife become apparent, several project design features for the evaporation ponds such as constructing perimeter fencing and installing covers to minimize wildlife access have been suggested. Staff has requested that the applicant develop a comprehensive draft Evaporation Pond Design, Monitoring and Management Plan, and to incorporate any revisions to pond size or design. Once the document is reviewed and approved by BLM, CDFG, USFWS, and staff, the plan would be incorporated into staff's proposed Condition of Certification **BIO-13**. This condition would reduce potential impacts of the evaporation ponds to less than significant levels under CEQA.

Impacts to CDFG Jurisdictional Streambeds and Waters of the U. S.: One of the significant biological impacts under CEQA of the project is the placement of SunCatchers and associated electrical collection system, hydrogen gas pipelines, debris basins, and access roads in ephemeral washes on the plant site, resulting in permanent loss of approximately 165 acres of Waters of the U. S. and 840 acres of CDFG jurisdictional streambeds. These washes are characterized by natural processes of soil deposition, channel formation, and development of microtopography and soil crusts, all of which support recruitment of native desert wash vegetation and provide wildlife habitat and a corridor for movement. Placement of the SunCatchers, access roads, road culverts, and debris/sediment basins within the beds of the ephemeral washes would disrupt the hydrological and biological functions and processes. The

CDFG is agreeable to mitigation to impacts to the ephemeral washes at a 1:1 compensation ratio of ephemeral wash within acquired Sonoran creosote scrub habitat independent of acquired FTHL compensation land. Staff concurs with the CDFG requiring 1:1 compensation ratio for impacts to the ephemeral washes on the project site. With implementation of staff's proposed Condition of Certification **BIO-17**, staff anticipates that impacts to 840 acres of CDFG jurisdictional streambeds and loss of the hydrological and biological functions of the project site desert washes would be mitigated to less than significant levels under CEQA. the USACE has indicated that a minimum of 2:1 mitigation ratio with half the mitigation from preservation and the other half from enhancement or restoration would be required to offset impacts from fill of Water of the U.S. Fill of Waters of the U. S. would require authorization by the USACE pursuant to Section 404 of the federal Clean Water Act (CWA) under an Individual Permit subject to CWA Section 404(b) (1) guidelines. Staff is awaiting the results of the federal CWA 404(1) (b) Alternatives Analysis and the conditions that would be included in the CDFG Lake and Streambed Alteration Agreement and CWA Section 404 Authorization. Once the conditions required by both agencies are known, the requirements would be incorporated into staff's proposed Condition of Certification **BIO-17**.

As there is currently no avoidance of aquatic resources for waters of the U.S. under USACE jurisdiction in the proposed project, for purposes of analysis pursuant to CWA Section 404(b) (1) guidelines, the USACE has proposed two alternatives which avoid different aspects of the ephemeral washes on the project site. These alternatives are: 1) Drainage Avoidance #1, which prohibits permanent impacts within the ten primary ephemeral washes; or 2) Drainage Avoidance #2, which eliminates the eastern and westernmost portions of the project site where the largest ephemeral drainage complexes are located.

For the proposed reclaimed water line alignment along Evan Hewes Highway, an estimated 2.33 acres each for Waters of the U. S. and CDFG jurisdictional streambeds has been calculated. The proposed reclaimed water line would either span or go under seven irrigation canals and the New River. It is anticipated that best management practices would be utilized to avoid impacts to Waters of the U. S. and CDFG jurisdictional streambeds for the proposed reclaimed water line, but this remains unresolved and proposed impacts have not been calculated.

With implementation of staff's proposed conditions of certification, staff is still uncertain if construction and operation of the proposed SES Solar Two Project would comply with all federal, state, and local LORS relating to biological resources. Staff recommends adoption of the Conditions of Certification to mitigate potential impacts for most sensitive biological resources to less than significant levels under CEQA with the exception of impacts to Waters of the U. S. Pending a LEDPA determination and requisite compensatory mitigation measures by the USACE, Staff is unable to determine whether the project would comply with Section 404 or 401 of the Clean Water Act, nor with related sections of the California Water Code.

Due to the lack of information regarding mitigation for Waters of the U.S., it is unknown if impacts from the proposed SES Solar Two Project to biological resources would be mitigated to less than significant levels under CEQA. Similarly for purposes of NEPA

compliance, it is unknown if the proposed SES Solar Two Project would not result in adverse impacts to biological resources due to the lack of information regarding impacts to and mitigation for Waters of the U.S.

Alternatives. Similar to the proposed project, staff is still uncertain if compliance with LORS and the implementation of staff's proposed conditions of certification to be sufficient to mitigate potential impacts to biological resources, specifically to Waters of the U. S. and CDFG jurisdictional state waters to less than significant levels associated with the 300 MW Alternative 1 under CEQA.

Staff considers project compliance with LORS and staff's proposed conditions of certification for the proposed project to be sufficient to mitigate the potential impacts to biological resources of the Drainage Avoidance #1 Alternative to less than significant levels under CEQA, if conditions required by the USACE for a federal Clean Water Act 404(1)(b) Impact Analysis and CDFG Lake and Streambed Alternative Agreement are incorporated into staff's proposed Condition of Certification **BIO-17**.

Staff considers project compliance with LORS and staff's proposed conditions of certification for the proposed project to be sufficient to mitigate the potential impacts to biological resources of the Drainage Avoidance #2 alternative to less than significant levels under CEQA, if conditions required by the USACE for a federal Clean Water Act 404(1)(b) Impact Analysis and CDFG Lake and Streambed Alternative Agreement are incorporated into staff's proposed Condition of Certification **BIO-17**.

With the No Action Alternative, the impacts of the proposed project to biological resources, including FTHL and other special status plant and wildlife species, and ephemeral drainages would not occur. The No Action Alternative would not cause any significant impacts under CEQA to biological resources, so no mitigation or compensation for habitat loss would be required.

Cultural Resources

The SES Solar Two Project was originally developed as a nominal 900 MW project covering approximately 7,700 acres. During the initial review with the BLM, prior to the filing of the AFC with the Energy Commission, the BLM and applicant determined that the potential impact to cultural resources needed to be reduced. The applicant reduced the proposed project by 150 MW and approximately 1,200 acres to avoid culturally sensitive areas. The SES Solar Two Project under review in this SA/DEIS is a result of that avoidance of culturally sensitive areas.

The cultural resources analysis concluded that the SES Solar Two Project would have significant adverse effects under CEQA on a presently unknown subset of approximately 328 known prehistoric and historical surface archaeological resources and may have significant adverse effects under CEQA on an unknown number of buried archaeological deposits, many of which may be determined historically significant under the provisions of a proposed programmatic agreement currently under development as part of the BLM National Historic Preservation Act Section 106 consultation process. Absent adequate data to date, the Energy Commission and BLM are proposing to develop treatment measures that would be stipulated in a programmatic agreement that

would be executed by signatory parties prior to issuance of the Record of Decision (ROD).

Alternatives. Similar to the proposed project, staff is still uncertain of the potential impacts associated with the 300 MW Alternative. When resource evaluations have been completed, impacts will be assessed. The observation and identification of 30 cultural resources thus far, including prehistoric trails, as part of the 25% re-survey suggests extensive use of the project landform in the past. If impacts are deemed significant, mitigation measures would be stipulated and refined in a Programmatic Agreement negotiated among all consulting parties and executed by the BLM.

Similar to the proposed project, staff is still uncertain of the potential impacts associated with Drainage Avoidance Alternative #1. When resource evaluations have been completed, impacts will be assessed. The observation and identification of 74 cultural resources thus far as part of the 25% re-survey suggests extensive use of the project landform in the past. If impacts are deemed significant, mitigation measures would be stipulated and refined in a Programmatic Agreement negotiated among all consulting parties and executed by the BLM.

Similar to the proposed project, staff is still uncertain of the potential impacts associated with Drainage Avoidance Alternative #2. When resource evaluations have been completed, impacts will be assessed. The observation and identification of 37 cultural resources thus far as part of the 25% re-survey suggests extensive use of the project landform in the past. If impacts are deemed significant, mitigation measures would be stipulated and refined in a Programmatic Agreement negotiated among all consulting parties and executed by the BLM.

With the No Action Alternative, the impacts of the proposed project to cultural resources would not occur. The No Action Alternative would not cause any significant impacts under CEQA to biological resources, so no mitigation would be required.

Facility Design

The Energy Commission staff concludes that the design, construction, and decommissioning of the project and its linear facilities would likely comply with applicable engineering LORS. The proposed conditions of certification would ensure compliance with the applicable LORS:

Design review, plan checking, and field inspections would be performed by the CBO or other Energy Commission delegate. Staff would audit the CBO to ensure satisfactory performance.

Though future conditions that could affect decommissioning are largely unknown at this time, it can reasonably be concluded that if, the project owner submits a decommissioning plan as required in the **General Conditions** portion of this document prior to decommissioning, decommissioning procedures would comply with all applicable engineering LORS.

Energy Commission staff further recommends that:

1. The proposed conditions of certification be adopted to ensure that the project is designed and constructed in a manner that protects the public health and safety and complies with all applicable engineering LORS;
2. The project be designed and built to the 2007 CBC (or successor standards, if in effect when initial project engineering designs are submitted for review); and
3. The CBO reviews the final designs, checks plans, and performs field inspections during construction. Energy Commission staff shall audit and monitor the CBO to ensure satisfactory performance.

Alternatives. The Facility Design section does not address environmental impacts under either CEQA or NEPA. The same LORS and Conditions of Certification would also apply to each of the Project Alternatives. LORS would not apply to the three No Project Alternatives because the project would not be constructed.

Geology, Paleontology, and Minerals

BLM and Energy Commission staff find that with the adoption of the mitigation and conditions of certification, the proposed SES Solar Two Project would comply with all applicable LORS, and would not result in significant adverse short and long term or cumulative geologic, paleontological, and mineralogical impacts under CEQA.

The proposed SES Solar Two Project site is located in an active geologic area of the south-central Colorado Desert Geomorphic Province in south-central Imperial County in south-eastern California. Because of its geologic setting, the site could be subject to intense levels of earthquake-related ground shaking. The potential effects of strong ground shaking would be mitigated through structural designs required by the California Building Code (CBC 2007) and the project geotechnical report. The CBC (2007) requires that structures be designed to resist seismic stresses from ground acceleration and, to a lesser extent, liquefaction potential. A geotechnical investigation has been performed and presents standard engineering design recommendations for mitigation of seismic shaking and site soil conditions.

There are no known viable geologic or mineralogical resources at the proposed Solar Two site. Locally, paleontological resources have been documented within Quaternary alluvium, Colluvium, lakebed sediments, and sedimentary units of the Palm Spring formation, all of which underlie the site in the near surface. Potential project impacts to paleontological resources would be mitigated below a level of significance under CEQA through worker training and monitoring by qualified paleontologists, as required by Conditions of Certification, **PAL-1** through **PAL-7**.

Based on its independent research and review, Energy Commission staff believes that the potential is low for significant adverse impacts under CEQA to the proposed project from geologic hazards during its design life and to potential geologic, mineralogical, and paleontological resources from the construction, operation, and closure of the proposed project. It is staff's opinion that the SES Solar Two Project could be designed and constructed in accordance with all applicable LORS and in a manner that both protects environmental quality and assures public safety.

General conditions of certification with respect to engineering geology are proposed under Conditions of Certification **GEN-1, GEN-5, and CIVIL-1** in the **FACILITY DESIGN** section. It is staff's opinion that the likelihood of encountering paleontological resources is moderate at the plant site.

Alternatives. If the reduced acreage of the 300 MW Alternative were constructed, the CEQA Level of Significance, for geological, paleontological and mineral resources would amount to roughly 40% of the levels described for the proposed project. Potential impacts to paleontological resources would be reduced below a level of significance under CEQA through worker training and monitoring by qualified paleontologists, as required by Conditions of Certification, **PAL-1** through **PAL-7.** Based on its independent research and review, Energy Commission staff believes that the potential is low for significant adverse impacts under CEQA to the proposed project from geologic hazards during its design life and to potential geologic, mineralogical, and paleontological resources from the construction, operation, and closure of the proposed project.

Like the proposed SES Solar Two Project, the potential is low for significant adverse impacts to the Drainage Avoidance #1 Alternative from geologic hazards during its design life and to potential geologic, mineralogical, and paleontological resources from the construction, operation, and closure of the proposed project. It is staff's opinion that the alternative could be designed and constructed in accordance with all applicable laws, ordinances, regulations, and standards and in a manner that both protects environmental quality and assures public safety, to the extent practical.

Like the proposed Solar Two Project, the potential is low for CEQA significant adverse impacts to the Drainage Avoidance #2 Alternative from geologic hazards during its design life and to potential geologic, mineralogical, and paleontological resources from the construction, operation, and closure of the proposed project. It is staff's opinion that the alternative could be designed and constructed in accordance with all applicable laws, ordinances, regulations, and standards and in a manner that both protects environmental quality and assures public safety, to the extent practical.

With the No Project / No Action Alternative the impacts of the proposed project would not occur. However, the land on which the project is proposed would become available to other uses that are consistent with BLM's land use plan.

Hazardous Materials

The BLM and Energy Commission staff evaluation of the proposed SES Solar Two Project indicated that hazardous materials use, storage, and transportation as part of t the proposed Project would not present a significant adverse impact under CEQA on the public or environment. With adoption of the proposed conditions of certification, the proposed project would comply with all applicable LORS related to hazardous materials.

Staff proposes six conditions of certification related to hazardous materials. **HAZ-1** ensures that no hazardous materials would be used at the facility except as listed in the AFC, unless there is prior approval by the Energy Commission Compliance Project Manager (CPM). **HAZ-2** ensures that local emergency response services are notified of the amounts and locations of hazardous materials at the facility. **HAZ-3** requires the development of a Safety Management Plan that addresses the delivery of all liquid

hazardous materials during the construction, commissioning, and operation of the project would further reduce the risk of any accidental release not specifically addressed by the proposed spill prevention mitigation measures, and further prevent the mixing of incompatible materials that could result in the generation of toxic vapors. Site security during both the construction and operation phases is addressed in **HAZ-4** and **HAZ-5. HAZ-6** ensures that the applicant complies with all Federal LORS regarding use, management, spills, and reporting of hazardous materials on Federal lands.

Alternatives. Like the proposed project, the construction and operation of the 300 MW Alternative would be in compliance with all applicable LORS for both long-term and short-term project impacts in the area of hazardous materials management with the adoption of the proposed conditions of certification. The mitigation that would be proposed for the 300 MW Alternative would be the same as that proposed for the proposed project (staff recommended conditions **HAZ-1** to **HAZ-6**).

Like the proposed project, the construction and operation of the Drainage Avoidance #1 Alternative would be in compliance with all applicable LORS for both long-term and short-term project impacts in the area of hazardous materials management with the adoption of the proposed conditions of certification. The mitigation that would be proposed for the Drainage Avoidance #1 Alternative would be the same as that proposed for the proposed project (staff recommended conditions **HAZ-1** to **HAZ-6**).

Like the proposed project, the construction and operation of the Drainage Avoidance #2 alternative would be in compliance with all applicable LORS for both long-term and short-term project impacts in the area of hazardous materials management with the adoption of the proposed conditions of certification. The mitigation that would be proposed for the Drainage Avoidance #1 Alternative would be the same as that proposed for the proposed project (staff recommended conditions **HAZ-1** to **HAZ-6**).

As the use of hazardous materials at the proposed project would have no CEQA significant impacts off-site, there would be no significant impact on the public resulting from their use under CEQA. Thus, the No Project/No Action alternative would not avoid or lessen any significant impacts compared to the proposed project under CEQA.

Hydrology, Soils and Water

Energy Commission staff has determined that construction, operation, and decommissioning of the proposed SES Solar Two Project could potentially impact soils, surface water, flooding, surface water quality, ground water quality, and water supply. Where these potential impacts have been identified, staff has proposed mitigation measures to reduce those impacts to below a level of significance under CEQA. With the possible exception of Sections 404 and 401 of the Clean Water Act, and related California water quality regulations, the project would conform to all applicable LORS. Staff's conclusions related to hydrology, soils, and water is:

1. The project would place more than 5,000 SunCatchers within areas known to be subject to flash flooding and erosion. Project-related changes to the braided and alluvial fan stream hydraulic conditions could result in on-site erosion, stream bed degradation or aggradation, and erosion and sediment deposition impacts to adjacent land. SunCatchers within the floodplain could be subject to destabilization

by stream scour. Impacts to soils related to wind erosion and runoff-borne erosion are potentially significant under CEQA, as are impacts to surface water quality from sedimentation and the introduction of foreign materials, including potential contaminants, to the project area.

2. Based on the project hydrologic study and hydraulic modeling of the major stream channels on the project site, scour analyses indicate the project can be designed to withstand flash flood flows with minimal damage to the SunCatchers. Condition of Certification **SOIL&WATER-6** ensures no significant impact under CEQA to SunCatchers placed in the floodplain.

3. A Drainage, Erosion, and Sedimentation Control Plan (DESCP) would mitigate the potential storm water and sediment project-related impacts. Based on an independent preliminary assessment, staff has determined the proposed project could result in erosion and stream morphology impacts that would be significant under CEQA. Conditions of Certification **SOIL&WATER-1, SOIL&WATER-5,** and **SOIL&WATER-6** require development of best management practices and monitoring and reporting procedures to mitigate impacts related to flooding, erosion, sedimentation, and stream morphological changes. These conditions of certification would minimize impacts, but due to the uncertainty associated with the existing analysis, impacts related to erosion, sedimentation and stream morphological changes are considered to be significant after mitigation under CEQA.

4. Surface water and ground water quality could be affected by construction activities, ongoing operations activities including mirror washing, vehicle use and fueling , storage of oils and chemicals, the proposed septic and leach field system for sanitary wastes, and wastes from the water treatment system. These impacts are potentially significant under CEQA. Compliance with LORS and Conditions of Certification **SOIL&WATER-1, SOIL&WATER-3, SOIL&WATER-5, SOIL&WATER -6, SOIL&WATER -7** and **SOIL&WATER-8** would mitigate those impacts to below a level of significance under CEQA in all areas except those associated with the sediment content of water related to stream morphological changes. Uncertainty regarding sediment content of runoff water results in a conclusion of potential significant adverse water quality impacts under CEQA.

5. The USACE has determined that 878 acres of the project site are jurisdictional waters of the U.S. under CWA Section 404, including 165 acres that would be subject to permanent impacts. The USACE has not yet completed a determination of the Least Environmentally Damaging Practicable Alternative (LEDPA) pursuant to CWA Section 404(b)(1) guidelines. Pending a LEDPA determination and requisite compensatory mitigation measures by the USACE, Staff is unable to determine whether the project would comply with Section 404 or 401 of the Clean Water Act, nor with related sections of the California Water Code.

6. SunCatcher mirrors would be washed on a regular basis. Mirror washing and dust control watering would comprise the primary water use for the project, which is estimated at 33,550 gallons per day (gpd), with total annual use approximately 32.7 acre feet. The applicant proposes to upgrade the Seeley Waste Water Treatment Plant (SWWTP), approximately 12 miles east of the site, to provide up to 200,000

gpd of reclaimed water for project use. That reclaimed water would be treated on the project site for use in mirror washing. By using SWWTP water, the project would comply with State policies regarding the use of recycled water for power plants where practicable. Potable water would be supplied to the site by truck. Conditions of Certification **SOIL&WATER -2**, **SOIL&WATER-3**, **SOIL&WATER-7** and **SOIL&WATER-9** are proposed by staff to ensure adequate water supply and that the water supply and treatment system comply with LORS and not create adverse water quality or supply impacts.

7. Impacts to groundwater supply and quality would be less than significant under CEQA. No groundwater would be used by the project and the effect on groundwater infiltration would be negligible.

Alternatives. The 300 MW Alternative has the same impacts as the proposed project, but reduced by approximately 60% due to smaller project size. Soil erosion impacts by water would potentially be significant and adverse under CEQA, but reduced in magnitude in comparison to the proposed project. All other impacts would be mitigated to a level less than significant under CEQA.

Drainage Avoidance #1 Alternative avoids CEQA significant adverse soil erosion impacts related to stream morphology and sediment transport. All other impacts are the same as for the proposed project, but reduced slightly due to smaller project size. With compliance with LORS and compliance with Conditions of Certification, Drainage Avoidance #1 Alternative has no significant adverse impacts under CEQA.

Drainage Avoidance #2 Alternative has the same impacts as the proposed project, but reduced by approximately 68% due to smaller project size. Soil erosion impacts by water would be significant and adverse under CEQA, but reduced in magnitude in comparison to the proposed project. All other impacts would be mitigated to a level less than significant under CEQA.

Under the No Project/No Action Alternative the impacts of the proposed project would not occur. However, the land on which the project is proposed would become available to other uses that are consistent with BLM's land use plan, including another renewable energy projects.

Land Use and Recreation

The proposed SES Solar Two Project would not result in adverse impacts to agricultural or rangeland resources. The conversion of approximately 6,500 acres of land for the project to support the proposed project's components and activities would directly disrupt current recreational activities in established federal, state, and local recreation areas and would result in adverse effects on recreational users of these lands. Condition of Certification/Mitigation Measure **LAND-1** is proposed to help reduce these adverse effects on recreational users. Further, with implementation of staff's proposed Condition of Certification/Mitigation Measure **LAND-2**, the proposed project would be consistent with the applicable LORS pertaining to the Subdivision Map Act.

The applicant has submitted an application to the BLM requesting a right-of-way (ROW) grant to construct the proposed project and its related facilities. Pursuant to the

California Desert Conservation Area (CDCA) Plan (1980, as amended), sites associated with power generation or transmission not identified in the CDCA Plan are considered through the Plan Amendment process. Because the proposed project is not currently identified in the CDCA Plan, the proposed project would require a BLM ROW grant and a project-specific CDCA Plan Amendment.

For purposes of CEQA compliance, the level of significance of each impact of the proposed project on land use resources has been determined and is discussed in detail in Section C.8.4.3 (CEQA Level of Significance). In summary, impacts on agricultural lands and rangelands would be less-than-significant under CEQA, and there would be no impacts related to Williamson Act contracts. Impacts to recreation and wilderness resources would be less-than-significant under CEQA with implementation of Condition of Certification/Mitigation Measure **LAND-1**. Impacts to horses and burros would be less-than-significant under CEQA. LORS compliance impact would be less-than-significant under CEQA with implementation of Condition of Certification/Mitigation Measure **LAND-2**.

Alternative 1 to the proposed project would construct and operate a 300 MW facility using the Stirling SunCatcher technology and requiring 2,600 acres of land. Condition of Certification/Mitigation Measure **LAND-1** would reduce impacts below a level of significance under CEQA to recreationists in the project area.

Also included is the analysis of two alternatives that were developed to reduce impacts to the U.S. Army Corps of Engineer's primary waters within the project site. As a result, Drainage Avoidance 1 Alternative would prohibit permanent impacts within the 10 primary drainages within the proposed project boundaries; and Drainage Avoidance #2 Alternative would eliminate both the eastern and westernmost portions of the proposed project, where the largest drainage complexes are located. In general, the impacts associated with these alternatives would be the same as the proposed project, and Conditions of Certification/Mitigation Measures **LAND-1** and **LAND-2** would be required to mitigate project impacts to recreational users below a level of significance under CEQA.

Approximately one million acres of land are proposed for solar and wind energy development in the southern California desert lands. Cumulative impacts to approximately one million acres of land would all combine to result in adverse effects on agricultural lands and recreational resources. The cumulative conversion of these lands would preclude numerous existing land uses including recreation, wilderness, rangeland, and open space, and therefore, result in a significant and unavoidable cumulative impact related to land use under CEQA.

- No farmland conversion impacts are expected as a result of linear facilities' construction, and the proposed project would not involve other changes in the existing environment which could result in conversion of farmland, to non-agricultural uses.
- No conversion of rangelands would occur, and they would not be adversely affected by construction or operation of the proposed project.
- The conversion of 6,500 acres of land to support the proposed project's components and activities would directly disrupt current recreational activities in established

federal, state, and local recreation areas and would result in adverse effects on recreational users of these lands. Condition of Certification/Mitigation Measure **LAND-1** is proposed to reduce these adverse effects on recreational users below a level of significance under CEQA.

- The Yuha ACEC and Jacumba Wilderness surrounding the project site attract visitors based on their scenic, biological, cultural, and recreational amenities. The proposed project would impact the recreational and wilderness values of these areas. However, due to the abundance of wilderness and recreation sites throughout the county, the proposed project would impact a small fraction of these land uses.
- The proposed project would not contain or traverse any established BLM HAs or HMAs, and the HMA and HA are approximately 58 miles east side of the proposed project site. In addition, following construction, fencing around the site would keep any burros outside of the proposed project location. Therefore, the proposed project would not result in any interference with BLM's management of an HMA or HA.
- The proposed project would not disrupt or divide the physical arrangement of an established community.
- The applicant has submitted an application to the BLM requesting a right-of-way (ROW) to construct the proposed project and its related facilities. Pursuant to the California Desert Conservation Area (CDCA) Plan (1980, as amended), 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 manages. 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.
- Based on staff's independent review of applicable federal, state, and local LORS documents, the proposed project would be consistent with applicable land use LORS.
- With implementation of staff's proposed Conditions of Certification **LAND-2,** the proposed project would be consistent with the applicable LORS pertaining to the Subdivision Map Act.
- For purposes of CEQA compliance, the level of significance of each impact of the proposed project on land use resources has been determined and is discussed in detail in Section C.8.4.3 (CEQA Level of Significance). In summary, impacts on agricultural lands would be less-than-significant under CEQA, and there would be no impacts related to Williamson Act contracts. Impacts to recreation resources would be less-than-significant under CEQA with implementation of Condition of Certification/Mitigation Measure **LAND-1.** No impacts to horses and burros are anticipated and therefore impacts to horses and burros would be less-than-significant under CEQA. LORS compliance impact would be less-than-significant under CEQA with implementation of Condition of Certification/Mitigation Measure **LAND-2.**

- Cumulative impacts to approximately one million acres of land in the southern California desert would all combine to result in adverse effects on agricultural lands and recreational resources and would result in a significant and unavoidable impact under CEQA 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 therefore, would not create physical divisions of established residential communities. 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, result in a significant cumulative impact under CEQA.
- The land use impacts associated with the alternatives would be similar to the proposed project. To mitigate impacts to land uses below the level of significance under CEQA, implementation of Condition of Certification/Mitigation Measure **LAND-1** would be required for impacts related to recreation resources for each alternative; and Condition of Certification/Mitigation Measure **LAND-2** would also be required with each alternative, with the exception of Alternative 1, which would be constructed on BLM land only.

If the Energy Commission and the BLM approve the proposed project, staff is proposing Conditions of Certification/Mitigation Measures **LAND-1** to ensure that the proposed project mitigates for the permanent loss of recreational lands, and **LAND-2** to ensure that the project is constructed and operated in accordance with the Subdivision Map Act.

Alternatives. Similar to the proposed project, impacts resulting form the 300 MW Alternative on Land Use would be less-than-significant under CEQA with implementation of Condition of Certification **LAND-1**. However, the cumulative land use effects, as discussed in subsection C.8.5.2, of this alternative would be significant and unavoidable under CEQA.

Impacts resulting from Drainage Avoidance #1 Alternative on land use would be less-than-significant under CEQA with implementation of Condition of Certification **LAND-1.** As discussed in subsection C.8.5.2, and similar to the proposed project, the cumulative impacts of this alternative would be significant and unavoidable under CEQA.

Impacts resulting from Drainage Avoidance #2 Alternative land use would be less-than-significant under CEQA with implementation of Condition of Certification **LAND-1.** As discussed in subsection C.8.5.2, and similar to the proposed project, the cumulative impacts of this alternative would be significant and unavoidable under CEQA.

Under the No Project/No Action alternative land use impacts to the proposed project site and area would be similar as those currently occurring under the existing conditions in the area. Given that there would be no substantial change over the existing conditions, the land use impacts of the No Project/No Action alternative would be less-than-significant under CEQA.

Noise

Energy Commission staff concludes that the SES Solar Two Project can be built and operated in compliance with all applicable noise and vibration LORS and, if built in accordance with the conditions of certification, **NOISE-1** through **NOISE-6**, would produce no significant adverse noise impacts under CEQA on people within the affected area, either direct, indirect, or cumulative.

Alternatives. Given the nature of the operational noise produced by the chosen project technology, the 300 MW Alternative would most likely correspond to lower operational noise impacts at noise receptors located east of the project. Operational noise impacts at those receptors west of the project would likely be the same as that of the proposed 750 MW project. Certainly, the noise impacts of the 300 MW Alternative would not be greater than the noise impacts from the proposed 750 MW project, which, as discussed are not significant under CEQA. Energy Commission staff concludes that because this alternative would result in fewer construction activities than the proposed project, the 300 MW Alternative can be built and operated in compliance with all applicable noise and vibration LORS. Also, if built in accordance with the conditions of certification proposed for the proposed project, it would produce no significant adverse noise impacts on people within the affected area, either direct, indirect, or cumulative under CEQA.

Like the proposed project, the Drainage Avoidance #1 Alternative, if built and operated in conformance with the proposed conditions of certification defined for the proposed project, would comply with all applicable noise and vibration LORS and would produce no significant adverse noise impacts on people within the project area, directly, indirectly, or cumulatively under CEQA.

The Drainage Avoidance #2 Alternative would result in fewer construction activities and at greater distances from sensitive receptors than the proposed project. Therefore, Energy Commission staff concludes that the Drainage Avoidance #2 alternative can be built and operated in compliance with all applicable noise and vibration LORS. Also, if built in accordance with the conditions of certification proposed for the proposed project, Drainage Avoidance #2 alternative would produce no significant adverse noise impacts on people within the affected area, either direct, indirect, or cumulative under CEQA.

For the No Project / No Action Alternatives, the noise impacts associated with the proposed project would not occur. However, the land on which the project is proposed would become available to other uses that are consistent with BLM's land use plan.

Power Plant Efficiency

The Energy Commission staff has analyzed the potential efficiency in energy out associated with construction and operation of the Solar Two Project. The project would decrease reliance on fossil fuel due to increased availability of renewable energy resources. It would not create significant adverse effects on fossil fuel energy supplies or resources under CEQA, would not require additional sources of energy supply, and would not consume fossil fuel energy in a wasteful of inefficient manner. No efficiency standards apply to this project. Energy Commission staff concludes that this project

would present no significant adverse impacts on fossil fuel energy resources under CEQA.

Alternatives. The CEQA Level of Significance of the 300 MW Alternative would be unchanged from the proposed project.

The Drainage Avoidance #1 Alternative would occupy 10.12 acres per MW of power output (compared with nearly nine acres per MW of power output for the proposed project). Like the proposed project, this figure is substantially greater than that of some other solar power technologies. Employing a less land-intensive solar technology would reduce these impacts by approximately 50 percent. Fossil fuel use efficiency of the Drainage Avoidance #1 alternative would be unchanged, that is, no impact. Land use efficiency of the alternative would be substantially reduced under this alternative, because power output would be reduced in comparison to occupied land (assuming that all land within the fence line is considered to be occupied or otherwise removed from public use).

The Drainage Avoidance #2 Alternative would occupy a smaller area than the proposed project, resulting in 7.45 acres per MW of power output (compared with nearly nine acres per MW of power output for the proposed project). Like the proposed project, this figure is substantially greater than that of some other solar power technologies. Employing a less land-intensive solar technology would reduce these impacts by approximately 50 percent. Fossil fuel use efficiency of the Drainage Avoidance #2 alternative would be unchanged, that is, no impact. Land use efficiency of the alternative under this alternative would be essentially the same as that of the proposed project because within project boundaries, all lands would be available for development.

In the No Project /No Action Alternative, the proposed action would not be undertaken. Therefore, the impacts of the proposed project would not occur. However, the land on which the project is proposed would become available to other uses that are consistent with BLM's land use plan, including another renewable energy project.

Power Plant Reliability

Staff cannot determine whether the applicant's availability goal is achievable and cannot predict what the actual availability might be, given the demonstration status of this Stirling engine and limited data on large-scaled deployments of Stirling engines. (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.) Staff believes it possible that the project may face challenges from considerable maintenance demands, reducing its availability.

Alternatives. Like the proposed project, the 300 MW Alternative would require fewer SunCatcher groups to generate 300 MW (phase one) of the project. Therefore, this alternative would require fewer distribution and substation facilities to be built within the project site. Additionally, this alternative would not cause any reconductoring of the SDG&E transmission system. Since this alternative would require fewer distribution and transmission facilities to be built in the project site; this alternative causes fewer impacts to the environment and triggers less CEQA level analysis.

Like the proposed project, the Drainage #1 Alternative would include numerous groups of 60 SunCatchers, connected by underground electrical cables. When aggregated at the project substation, the power generated would interconnect to SDG&E's existing Imperial Valley 500/230 kV substation which is located southwest of El Centro, California. There would be fewer SunCatcher groups in this alternative, but the system of aggregation and power transmission would be the same as for the proposed project. Like the proposed project, the transmission system required for the Drainage Avoidance #1 alternative requires new components. While System Impact Studies have not been completed for the smaller generation capacity of this alternative, it is likely that the outlet lines and termination facilities are acceptable and would comply with all applicable LORS.

Like the proposed project and Drainage #1 Alternative, the Drainage #2 Alternative would include numerous groups of 60 SunCatchers, connected by underground electrical cables. There would be fewer SunCatcher groups in this alternative, but the system of aggregation and power transmission would be the same as for the proposed project. Like the proposed project, the transmission system required for the Drainage Avoidance #2 alternative requires new components. While System Impact Studies have not been completed for the smaller generation capacity of this alternative, it is likely that outlet lines and termination are acceptable and would comply with all applicable LORS.

In the No Project / No Action Alternative, the proposed action would not be undertaken and no solar generating or transmission facilities would be constructed on the project site or connecting to the existing transmission grid.

Public Health and Safety

The BLM and Energy Commission staff have analyzed potential public health and safety risks associated with construction and operation of the SES Solar Two Project and do not expect any substantial adverse cancer or short- or long-term noncancerous health effects from project toxic emissions under CEQA. Staff's analysis of potential health impacts from the proposed SES Solar Two Project uses a conservative health-protective methodology that accounts for impacts to the most sensitive individuals in a given population, including newborns and infants. According to the results of staff's health risk assessment, emissions from the SES Solar Two Project would not contribute substantially to morbidity or mortality in any age or ethnic group residing in the project area.

Alternatives. The types of construction and operational impacts of the 300 MW Alternative would be the same as those of the proposed project. The proposed project impacts are found to be less than significant under CEQA, and impacts of this alternative would be even smaller – although marginally so - due to the smaller extent of construction disturbance and the smaller number of SunCatchers of the alternative.

Like the proposed project, emissions from the Drainage Avoidance #1 Alternative would not contribute substantially to morbidity or mortality in any age or ethnic group residing in the project area. No construction or operational impacts are found to be significant under CEQA, and no mitigation measures (Conditions of Certification) are required.

Similar to the proposed project and Drainage Avoidance #1 Alternative, emissions from the Drainage Avoidance #2 Alternative would not contribute substantially to morbidity or mortality in any age or ethnic group residing in the project area. No construction or operational impacts are found to be significant under CEQA, and no mitigation measures (Conditions of Certification) are required.

Under the No Project/No Action alternative, public health impacts to the proposed project site and area would be similar as those currently occurring under the existing conditions in the area. Given that there would be no significant change over the existing conditions under CEQA, the public health impacts of the No Project/No Action alternative would be less-than-significant under CEQA.

Socioeconomics and Environmental Justice

Staff concludes that construction and operation of the SES Solar Two Project would not cause a significant direct, indirect, or cumulative adverse socioeconomic impact on the study area's housing, schools, parks and recreation, law enforcement, emergency services, or hospitals, under CEQA. Socioeconomic impacts of the SES Solar Two Project would not combine with impacts of any past, present, or reasonably foreseeable local projects to result in cumulatively considerable local impacts. Hence, there are no socioeconomic environmental justice issues related to this project. The SES Solar Two Project, as proposed, is consistent with applicable Socioeconomic LORS.

Estimated gross public benefits from the SES Solar Two Project include increases in sales, employment, and income in Imperial, Riverside, and San Diego counties during construction and operations. Taxes were also estimated. For example, there is an estimated average of 360 direct project-related construction jobs for the 40 months of construction. The Solar Two Project is estimated to have total project costs of $1.14 billion. The SES Solar Two Project local construction payroll is estimated to be $42.1 million annually, and the local operation payroll is $8,924,810 annually. If the California property tax exemption for solar systems is not renewed when it expires in 2015-2016 fiscal, then the project's property tax on private land (most of the project is on tax-exempt federal land) would be $840,750 annually. There is $35,250 in school impact fees. Total sales and use taxes during construction are estimated to be approximately $623,100 and during operation the local sales tax is estimated to be $387,500 annually. An estimated $2.41 million would be spent locally for materials and equipment during construction, and an additional $7.4 million would be spent annually for the project's local operations and maintenance budget.

Alternatives. Similar to the proposed project, no significant adverse impacts under CEQA would result from construction and operation of the 300 MW Alternative. The benefits of the project to the local economy would be somewhat reduced due to the smaller scale of the project.

No significant adverse impacts under CEQA would result from construction and operation of the Drainage Avoidance #1 Alternative, which is similar to the proposed project. The benefits of the project to the local economy would be somewhat reduced due to the smaller scale of the project.

Like the proposed project, no significant adverse impacts under CEQA would result from construction and operation of the Drainage Avoidance #2 Alternative. The benefits of the project to the local economy would be somewhat reduced due to the smaller scale of the project.

Under the No Project/No Action Alternative, the socioeconomic benefits of the proposed project site and area would be similar as those currently occurring under the existing conditions in the area. Given that there would be no substantial change over the existing conditions, impacts to socioeconomic resources of the No Project/No Action alternative would be less-than-significant under CEQA.

Traffic and Transportation

The SES Solar Two Project would be consistent with the Circulation and Scenic Highways Element of the County of Imperial General Plan and all other applicable LORS related to traffic and transportation. The SES Solar Two Project would not have a significant adverse impact under CEQA on the local and regional roadway network. During the construction and operation phases, local roadway and highway demand resulting from the daily movement of workers and materials would not increase beyond significance thresholds established by the County of Imperial or the State of California.

1. The SES Solar Two Project as proposed would comply with all applicable LORS related to traffic and transportation. It would result in less than significant impacts under CEQA to the traffic and transportation system.
2. Because of the SES Solar Two Project's distance from the nearest airport, no impact on the Emory Ranch Airport, Naval Air Facility El Centro or the Imperial County Airport would occur, and the project would not impact aviation safety.
3. The SES Solar Two Project as proposed would cause no significant direct or cumulative traffic and transportation impacts under CEQA, and therefore, no environmental justice issues.
4. Staff is proposing Condition of Certification **TRANS-1** which would require a construction traffic control plan to be developed and implemented prior to earth moving activities
5. Staff is proposing Condition of Certification **TRANS-2** which would require the applicant to provide the executed license agreement and subsequent approval of the physical improvements associated with the proposed railroad crossing.
6. Staff is proposing Condition of Certification **TRANS-3,** which would require mitigation plans for the roads that would be used for construction if they are damaged by project-related construction.
7. Staff is proposing Condition of Certification **TRANS-4** to address potential malfunctions in the mirror control, which could lead to glare impacts on motorists or pilots.

Alternatives. The 300 MW Alternative, if constructed with the same peak workforce as the proposed project, would result in the same levels of construction traffic and parking demand as the proposed project. However these conditions would occur for a shorter period of time given that the alternative would be approximately 40% of the size of the

proposed project. Like the proposed project, with implementation of recommended conditions of certification, impacts would remain less than significant under CEQA.

The Drainage Avoidance #1 Alternative, if constructed with the same peak workforce as the proposed project, would result in the same levels of construction traffic and parking demand as the proposed project. However these conditions would occur for a shorter period of time given that the alternative would be approximately 84% of the size of the proposed project. Like the proposed project, with implementation of recommended conditions of certification, traffic impacts associated with the Drainage Avoidance #1 Alternative would remain less than significant under CEQA.

The Drainage Avoidance #2 Alternative, if constructed with the same peak workforce as the proposed project, would result in the same levels of construction traffic and parking demand as the proposed project. However, these conditions would occur for a much shorter period of time given that the alternative would be approximately 50% of the size of the proposed project. Similar to the proposed project, with implementation of recommended conditions of certification, traffic impacts associated with the Drainage Avoidance #2 Alternative would remain less than significant under CEQA.

With the No Project/No Action Alternative, the proposed action would not be undertaken. Since no action would occur under the No Project/No Action Alternative, the transportation and traffic related impacts of the SES Solar Two Project would not occur at the proposed site.

Transmission Line Safety and Nuisance

The Applicant proposes to transmit the power from Phase I of the proposed SES Solar Two Project to the SDG&E transmission grid through a new, 10.3-mile double-circuit 230-kV transmission line constructed to run parallel to the existing Southwest Powerlink transmission line and connecting the project to the existing SDG&E Imperial Valley Substation to the southeast. Phase II would require SDG&E to build proposed 500-kV Sunrise Powerlink (or equivalent) transmission line (assumed be a project independent of the SES Solar Two Project). The construction and operation of Phase II is contingent on the approval and development of either the Sunrise Powerlink transmission line or additional transmission capacity in the SDG&E transmission system. This Phase II-related line would be under the jurisdiction of the California Public Utilities Commission (CPUC) and the BLM. Therefore, this staff analysis is for the Phase I-related 230-kV line. Since the Phases I and II lines would be located in the SDG&E service area, each would be constructed, operated, and maintained according to SDG&E's guidelines for line safety and field management which conform to applicable LORS. Each line would traverse undisturbed desert land with no nearby residents, thereby eliminating the potential for residential electric and magnetic field exposures. With the four proposed conditions of certification, any safety and nuisance impacts from the Phase I line the applicant proposes would be less than significant under CEQA.

Since staff does not expect the proposed 230-kV transmission line to pose an aviation hazard according to current FAA criteria, we do not consider it necessary to recommend location changes on the basis of a potential hazard to area aviation.

The potential for nuisance shocks would be minimized through grounding and other field-reducing measures that would be implemented in keeping with current SDG&E guidelines (reflecting standard industry practices). These field-reducing measures would maintain the generated fields within levels not associated with radio-frequency interference or audible noise.

The potential for hazardous shocks would be minimized through compliance with the height and clearance requirements of CPUC's General Order 95. Compliance with Title 14, California Code of Regulations, section 1250, would minimize fire hazards while the use of low-corona line design, together with appropriate corona-minimizing construction practices, would minimize the potential for corona noise and its related interference with radio-frequency communication in the area around the route.

Since electric or magnetic field health effects have neither been established nor ruled out for the proposed Solar Two Project and similar transmission lines, the potential public health significance of any related field exposures cannot be characterized with certainty under CEQA. The only conclusion to be reached with certainty is that the proposed line's design and operational plan would be adequate to ensure that the generated electric and magnetic fields are managed to an extent the CPUC considers appropriate in light of the available health effects information. The long-term, mostly residential magnetic exposure of health concern in recent years would be insignificant under CEQA for the proposed line given the absence of residences along the proposed route. On-site worker or public exposure would be short term and at levels expected for SDG&E lines of similar design and current-carrying capacity. Such exposure is well understood and has not been established as posing a substantial human health hazard.

Since the proposed project line would be operated to minimize the health, safety, and nuisance impacts of concern to staff and would be routed through an area with no nearby residences, staff considers the proposed design, maintenance, and construction plan as complying with the applicable LORS. With implementation of the four recommended conditions of certification, any such impacts would be less than significant under CEQA.

Alternatives. Since staff finds these safety and nuisance impacts to be less than significant under CEQA for the proposed 750 MW project, staff also expects them to be less than significant under CEQA for the smaller 300 MW alternative.

The transmission line for the Drainage Avoidance #1 Alternative would follow the same route as that for the proposed project, within an existing designated transmission corridor. The line would (a) be constructed, operated, and maintained according to SDG&E's guidelines for line safety and field management which conform to applicable LORS and (b) would traverse undisturbed desert land with no nearby residents, thereby eliminating the potential for residential electric and magnetic field exposures. Similar to the proposed project, adherence to the four conditions of certification recommended for the proposed project, any safety and nuisance impacts associated with the Drainage Avoidance #1 Alternative would be less than significant under CEQA.

Drainage Avoidance #2 Alternative would require new transmission lines within an existing designated corridor. Given the construction and maintenance requirements of

SDG&E and the lack of nearby residences, no impacts on residences or other facilities were identified. Like the proposed project, adherence to the four conditions of certification recommended for the proposed project would reduce any safety and nuisance impacts associated with Drainage Avoidance #2 Alternative to a less than significant level under CEQA.

Under the No Project/No Action alternative, the transmission line safety and nuisance impacts of the SES Solar Two project would not occur at the proposed site. This would help reduce the total human exposure to area field and non-field impacts from electric power lines in general.

Transmission System Engineering

The proposed Stirling Energy Systems Solar Two (SES Solar Two) Project outlet lines and termination are acceptable and would comply with all applicable LORS. The analysis of 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 the interconnection that are attributable to the project have been evaluated by staff and are included in the environmental sections of this staff assessment.

Mitigation of thermal overloads caused by the Phase 1 under N-1 contingency analysis would require installing a 500/230kV, 1120 megavolt ampere (MVA) transformer bank at the existing Imperial Valley Substation. The transformer installation would occur within the fence line of the existing Imperial Valley Substation and would not trigger the need for compliance with the California Environmental Quality Act (CEQA).

- Mitigation of base case thermal overloads caused by Phase 2 would require installing a third 230/69 kV, 224MVA transformer bank at the existing Sycamore Substation. The transformer installation would occur within the fence line of the existing Sycamore substation and would not trigger the need for compliance with CEQA.
- The proposed SES Solar Two project should be designed and constructed with adequate reactive power resources to compensate the consumption of volt-amperes reactive (Var) by the generator step-up transformers, distribution feeders and generator tie-lines.

The outlet lines and termination of Phases 1 and 2 of the proposed SES Solar Two project would comply with all applicable LORS. The analysis of 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 have been evaluated by staff and are included in the environmental sections of this SA/EIS as project conditions.

- Mitigation of thermal overloads caused by Phase 1 of the proposed Solar Two project under N-1 contingency analysis would require installing a 500/230kV, 1120MVA transformer bank at existing Imperial Valley Substation.
- Mitigation of base case thermal overloads caused by Phase 2 of the proposed Solar Two project, would require installing a third 230/69 kV, 224MVA transformer bank at the existing Sycamore Substation.

- The proposed Solar Two project should be designed and constructed with adequate reactive power resources to compensate the consumption of Var by the generator step-up transformers, distribution feeders and generator tie-lines.

If the BLM and Energy Commission approve the proposed Solar Two project, staff recommends that the conditions of certification/mitigation measures provided earlier be met to ensure both system reliability and conformance with LORS.

Alternatives. Like the proposed project, this alternative would require fewer SunCatcher groups to generate 300 MW (phase one) of the project. Therefore, the 300 MW Alternative would require fewer distribution and substation facilities to be built within the project site. Additionally, this alternative would not cause any reconductoring of the SDG&E transmission system. Since this alternative would require fewer distribution and transmission facilities to be built in the project site; it would also result in fewer impacts to the environment and triggers less CEQA level analysis.

Like the proposed project, the transmission system required for the Drainage Avoidance #1 alternative requires new components. While System Impact Studies have not been completed for the smaller generation capacity of this alternative, it is likely that the outlet lines and termination facilities are acceptable and would comply with all applicable LORS.

Like the proposed project, the transmission system required for the Drainage Avoidance #2 alternative requires new components. While System Impact Studies have not been completed for the smaller generation capacity of this alternative, it is likely that outlet lines and termination are acceptable and would comply with all applicable LORS.

In the No Project / No Action Alternative, the proposed action would not be undertaken and no solar generating or transmission facilities would be constructed on the project site or connecting to the existing transmission grid.

Visual Resources

Staff have analyzed visual resource-related information pertaining to the proposed SES Solar Two Project and conclude that the proposed project would substantially degrade the existing visual character and quality of the site and its surroundings, including motorists on Interstate 8, recreational destinations within the Yuha Desert Area of Critical Environmental Concern and portions of the Juan Bautista de Anza National Historic Trail, resulting in significant impacts under CEQA.

In the absence of photometric data to the contrary, staff believes that diffuse reflection from the SunCatchers could be an intrusive and distracting nuisance to motorists under at least certain conditions, particularly when an entire row of units could be visible in a near-vertical position to approaching motorists at hours near sunrise and sunset. However, with staff-recommended Condition of Certification **VIS-6**, potential glare/reflection impacts could be reduced to less-than-significant levels under CEQA.

With staff-recommended Condition of Certification **VIS-7**, construction impacts could be mitigated to less-than-significant levels under CEQA.

Mitigation measures **VIS-1 through VIS-7** would be implemented as Conditions of Certification for the proposed SES Solar Two Project, however, because effective, feasible mitigation measures could not be identified by staff, these impacts are considered to be unavoidable.

Alternatives. Impacts of the 300 MW Alternative would remain significant under CEQA to Interstate 8 and Yuha Desert Critical Environmental Concern viewers, and unavoidable. However, the degree and extent of those impacts would be substantially less than those of the proposed project.

The Drainage Avoidance #1 Alternative would be located within the same outer project boundaries as the proposed project, but it would be less densely developed because of avoidance of permanent structures in the major drainages. Like the proposed SES Solar Two Project, the Drainage Avoidance #1 alternative would substantially degrade the existing visual character and quality of the site and its surroundings, including motorists on Highway I-8, recreational destinations within the Yuha Desert ACEC, and portions of the Juan Bautista de Anza National Historic Trail, resulting in significant impacts under CEQA. Overall, the level of impact would be similar to the Proposed Project Alternative. There are no effective, feasible mitigation measures that could be identified, so the impacts of the Drainage Avoidance #1 are considered to be significant under CEQA and unavoidable. Impacts of the Drainage Avoidance #1 Alternative would be substantially similar to the Proposed Project Alternative, and thus significant under CEQA and unavoidable.

The Drainage Avoidance #2 Alternative would be smaller in area than the proposed project, and it would result in similar impacts as the proposed project, but somewhat more concentrated. Impacts of this alternative would remain significant under CEQA to I-8 and Yuha Desert ACEC viewers, and unavoidable. However, like the 300 MW alternative, the degree and extent of those impacts would be substantially less than those of the proposed project. Although the degree and extent of these impacts would be substantially less than those of the proposed project, there are no effective, feasible mitigation measures that could be identified to reduce impacts of this alternative. As a result, the impacts of the Drainage Avoidance #2 are considered to be significant and unavoidable under CEQA.

Under the No Project/No Action Alternative visual impacts to the proposed project site and area would be similar as those currently occurring under the existing conditions in the area. Given that there would be no substantial change over the existing conditions, the anticipated impacts of the No Project/No Action alternative would be less-than-significant under CEQA.

Waste Management

Management of the waste generated during construction and operation of the SES Solar Two Project would not generate a significant impact under CEQA regarding waste management and would be consistent with the applicable waste management LORS if the measures proposed in the Application for Certification and staff's proposed conditions of certification are implemented. Similar to the proposed project, staff considers project compliance with applicable waste management LORS and staff's conditions of certification to be sufficient to ensure that no significant impacts under

CEQA would occur as a result of waste management associated with the 300 MW alternative, Drainage Avoidance #1 alternative and Drainage Avoidance #2 alternative.

After review of the applicant's proposed waste management procedures, staff concludes that project wastes would be managed in compliance with all applicable waste management LORS. Staff notes that construction, demolition, and operation wastes would be characterized and managed as either hazardous or non-hazardous waste. All non-hazardous wastes would be recycled to the extent feasible, and nonrecyclable wastes would be collected by a licensed hauler and disposed of at a permitted solid waste disposal facility. Hazardous wastes would be accumulated onsite in accordance with accumulation time, and then properly manifested, transported to, and disposed of at a permitted hazardous waste management facility by licensed hazardous waste collection and disposal companies.

However, to help ensure and facilitate ongoing project compliance with LORS, staff proposes Conditions of Certification **WASTE-1** through -**8**. These conditions would require the project owner to do all of the following:

- Ensure the project site is investigated and any contamination identified is remediated as necessary, with appropriate professional and regulatory agency oversight (**WASTE-1** and **-2).**
- Prepare Construction Waste Management and Operation Waste Management Plans detailing the types and volumes of wastes to be generated and how wastes would be managed, recycled, and/or disposed of after generation (**WASTE-3** and **-7**).
- Obtain a hazardous waste generator identification number (**WASTE-4**).
- Ensure that all spills or releases of hazardous substances are reported and cleaned-up in accordance with all applicable federal, state, and local requirements (**WASTE-8**).
- Comply with waste recycling and diversion requirements (**WASTE-6**).
- Report any waste management-related LORS enforcement actions and how violations would be corrected (**WASTE-5**).

The existing available capacity for the Class III landfills that may be used to manage nonhazardous project wastes exceeds 3.73 million cubic yards, with another 600 million cubic yards of capacity expected in the future with full operation of the Mesquite Regional Landfill. The total amount of non-hazardous wastes generated from construction, demolition and operation of the Solar Two Project would contribute much less than 1% of the projected landfill capacity. Therefore, disposal of project generated non-hazardous wastes would have a less than significant impact on Class III landfill capacity under CEQA.

In addition, the two Class I disposal facilities that could be used for hazardous wastes generated by the construction and operation of the SES Solar Two Project have a combined remaining capacity in excess of 16 million cubic yards, with another 4.6 to 4.9 million cubic yards of proposed capacity. The total amount of hazardous wastes generated by the SES Solar Two Project would be less than significant under CEQA in relation to the remaining permitted capacity. Therefore, impacts from disposal of SES

Solar Two Project generated hazardous wastes would also have a less than significant impact on the remaining capacity at Class I landfills under CEQA.

Staff concludes that management of the waste generated during construction and operation and decommissioning of the SES Solar Two Project would not result in any significant adverse impacts under CEQA, and would comply with applicable LORS, if the waste management practices and mitigation measures proposed in the SES Solar Two Project AFC and staff's proposed conditions of certification are implemented.

Alternatives. The 300 MW alternative would generate similar types of hazardous and non-hazardous wastes from construction, demolition and operation of the project. However, the quantities of waste would be reduced by 60 percent. The amount of non-hazardous and hazardous solid wastes generated under a 300 MW alternative that would require landfill/treatment would be approximately 5,600 and 20 cubic yards, respectively. Similar to the proposed project, staff would not require investigation and remediation of soil and groundwater contamination. similar to the proposed project, staff considers project compliance with LORS and staff's conditions of certification to be sufficient to ensure that no CEQA significant impacts would occur as a result of waste management associated with the 300 MW alternative.

The Drainage Avoidance #1 Alternative would generate similar types of hazardous and non-hazardous wastes from construction, demolition and operation of the project. However, the quantities of waste would be reduced due to the reduced use of the site required by avoiding the primary drainages and the reduced number of SunCatchers. The amount of non-hazardous and hazardous solid wastes generated under this alternative that would require landfill/treatment would be reduced in comparison to the proposed project. Similar to the proposed project, staff considers project compliance with LORS and staff's conditions of certification to be sufficient to ensure that no CEQA significant impacts would occur as a result of waste management associated with the Drainage Avoidance #1 alternative.

The Drainage Avoidance #2 Alternative would generate similar types of hazardous and non-hazardous wastes from construction, demolition and operation of the project. However, the quantities of waste would be substantially reduced due to the reduced use of the site required by avoiding the major drainages at the east and west ends of the property. Similar to the proposed project, staff considers project compliance with LORS and staff's conditions of certification to be sufficient to ensure that no CEQA significant impacts would occur as a result of waste management associated with the Drainage Avoidance #2 Alternative.

In the No Project/No Action Alternative, the proposed action would not be undertaken. Therefore, waste management associated impacts of the proposed project would not occur.

Worker Safety and Fire Protection

Staff conclude that if the applicant for the proposed SES Solar Two Project provides project construction safety and health and project operations and maintenance safety and health programs, as required by conditions of certification **WORKER SAFETY -1, -2, -3, -4, -5,** and **-6**, the project would incorporate sufficient measures to both ensure

adequate levels of industrial safety and comply with applicable LORS. These proposed conditions of certification ensure that these programs, proposed by the applicant, would be reviewed by the appropriate agencies before they are implemented. The conditions also require verification that the proposed plans adequately ensure worker safety and fire protection and comply with applicable LORS.

Staff also concludes that the proposed project would not have significant impacts under CEQA on local fire protection services. The fire risks at the proposed facility do not pose substantial added demands on local fire protection services. Staff also concludes that the El Centro Fire Department is adequately equipped and staffed to respond to hazardous materials incidents at the proposed facility with an adequate response time, given the remote location of this project.

Staff conclude that if the applicant for the proposed SES Solar Two Project provides project construction safety and health and project operations and maintenance safety and health programs, as required by conditions of certification **WORKER SAFETY -1**, and **-2**; and fulfills the requirements of conditions of certification **WORKER SAFETY-3** through**-6**, SES Solar Two Project would incorporate sufficient measures to ensure adequate levels of industrial safety and comply with applicable LORS. Staff also concludes that the proposed project would not have significant impacts under CEQA on local fire protection services.

Alternatives. Since the proposed project impacts are found to be less than significant under CEQA with the incorporation of conditions of certification, impacts of the 300 MW Alternative would be even smaller due to the smaller extent of construction disturbance and the smaller number of SunCatchers under this alternative. Like the proposed project, the construction and operation of the 300 MW Alternative would be in compliance with all applicable LORS for both long-term and short-term project impacts in the area of worker safety and fire protection with the adoption of the proposed conditions of certification. The mitigation that would be proposed for the 300 MW alternative would be the same as that proposed for the proposed project (staff recommended conditions **WORKER SAFETY-1** to **WORKER SAFETY-6**).

The types of construction and operational impacts of the Drainage Avoidance #1 Alternative would be the same as those of the proposed project. The proposed project impacts are found to be less than significant under CEQA with the incorporation of conditions of certification, and impacts of this alternative would be even smaller due to the smaller extent of construction disturbance and the smaller number of SunCatchers of the alternative. Like the proposed project, the construction and operation of the Drainage Avoidance #1 Alternative would be in compliance with all applicable LORS for both long-term and short-term project impacts in the area of worker safety and fire protection with the adoption of the proposed conditions of certification. The mitigation that would be proposed for the Drainage Avoidance #1 Alternative would be the same as that proposed for the proposed project (staff recommended conditions **WORKER SAFETY-1** to **WORKER SAFETY-6**).

Like the proposed project, the construction and operation of the Drainage Avoidance #2 alternative would be in compliance with all applicable LORS for both long-term and short-term project impacts in the area of worker safety and fire protection with the

adoption of the proposed conditions of certification. The mitigation that would be proposed for the Drainage Avoidance #1 Alternative would be the same as that proposed for the proposed project (staff recommended conditions **WORKER SAFETY-1** to **WORKER SAFETY-6**).

As staff concludes that the proposed project would not have substantial impacts on local fire protection services, it would not cause a under CEQA impact on the public. Thus Staff concludes that the No Project/No Action alternative would not avoid or lessen a significant impact under CEQA compared to the proposed project. Staff concludes that if the applicant for the proposed SES Solar Two Project provides project construction safety and health and project operations and maintenance safety and health programs, as required by proposed **WORKER SAFETY** conditions of certification; SES Solar Two would incorporate sufficient measures to ensure adequate levels of industrial safety and comply with applicable LORS. As worker safety is a LORS-conformity requirement, the No Project/No Action alternative consideration is not applicable to the worker safety topic.

NOTEWORTHY PUBLIC BENEFITS

Staff has identified the following public benefits.

1. Greenhouse gas (GHG) related noteworthy public benefits include the construction and operation of renewable and low-GHG emitting generation technologies and the potential for successful integration into the California and greater WECC electricity systems. Renewable energy facilities, such as the Solar Two Project, are needed to meet California's mandated renewable energy goals.
2. The SES Solar Two Project would employ an advanced solar thermal technology. Solar energy is renewable and unlimited. The project would have a less than significant adverse impact under CEQA on nonrenewable energy resources (natural gas). Consequently, the project would help in reducing California's dependence on fossil fuel-fired power plants.
3. The science of paleontology is advanced by the discovery, study and duration of new fossils. These fossils can be substantial if they represent a new species, verify a known species in a new location and/or if they include structures of similar specimens that had not previously been found preserved. In general, most fossil discoveries are the result of excavations, either purposeful in known or suspected fossil localities or as the result of excavations made during earthwork for civil improvements or mineral extraction. Proper monitoring of excavations at the proposed SES Solar Two facility, in accordance with an approved Paleontological Monitoring and Mitigation Plan, could result in a benefit to the science of paleontology and should minimize the potential to damage a substantial paleontological resource.
4. It is noteworthy that a solar electric generating facility such as the proposed SES Solar Two Project would emit substantially less toxic air containment (TACs) to the environment 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 Solar Two Project

would provide much needed electrical power to California residences and businesses, and would contribute to electric reliability. Electrical power is not only necessary to maintain a functioning society, but it also benefits many individuals who rely on powered equipment for their health (such as dialysis equipment and temperature control equipment). For example, it is documented that during heat waves in which elevated air-conditioning use causes an electrical blackout, hospitalizations and deaths due to heat stroke are increased and injury/deaths rise from indirect impacts when public safety measures are lost (traffic lights, elevators, etc.).

5. Important public benefits discussed under the fiscal and non-fiscal effects section are: capital expenditures, construction and operation payroll, and sales tax.

A - INTRODUCTION

Jim Stobaugh and Christopher Meyer

INTRODUCTION

The proposed action evaluated within this Staff Assessment (SA)/Draft Environmental Impact Statement (DEIS) is the construction and operation of the Stirling Energy Systems Solar Two (SES Solar Two) Project, a proposed solar thermal electricity generation facility located on both private lands and public lands managed by the Bureau of Land Management (BLM) in Imperial County, California. The SA/DEIS represents a joint environmental review document developed by the California Energy Commission (Energy Commission) and BLM to evaluate potential impacts associated with the proposed action.

When considering an energy project for licensing, the Energy Commission is the lead state agency for evaluating environmental impacts of a proposed licensing action under the California Environmental Quality Act (CEQA). The SA, the result of the Energy Commission staff's environmental evaluation process, is functionally equivalent to the preparation of an Environmental Impact Report (EIR).

Because the proposed project is located on public lands managed by the BLM, BLM is the lead federal agency for evaluating environmental impacts of the proposed right-of-way grant under the National Environmental Policy Act (NEPA). The DEIS is the BLM's environmental evaluation of the potential impacts that could result from the authorization of the requested right-of-way. The Department of Energy (DOE) and BLM signed an MOU in January of 2010 to have the DOE as a cooperating agency on this project. The applicant has applied to the DOE for a loan guarantee under Title XVII of the Energy Policy Act of 2005 (EPAct 05), as amended by Section 406 of the American Recovery and Reinvestment Act of 2009, P.L. 111-5 (the "Recovery Act"). Should DOE decide to enter into negotiation of a possible loan guarantee with the Applicant, DOE would become a cooperating agency in developing the final EIS. The purpose and need for action by DOE is to comply with its mandate under EPAct by selecting eligible projects that meet the goals of the Act. The U.S. Army Corps of Engineers (USACE) is also a cooperating agency on the FSA/EIS with the BLM pursuant to the Clean Water Act (CWA) which authorizes the Secretary of the Army, acting through the Corps, to issue permits regulating the discharge of dredged or fill material into waters of the United States (U.S.).

In August 2007, the Energy Commission and BLM California Desert District (CDD) entered into a Memorandum of Understanding (MOU) to jointly develop the environmental analysis documentation for solar thermal projects which are under the jurisdiction of both agencies. The purpose of the MOU is to avoid duplication of staff efforts, share staff expertise and information, promote intergovernmental coordination, and facilitate public review. This document represents the Energy Commission's SA, as well as the BLM's DEIS. Following a 90-day public comment period, the BLM and Energy Commission staff will issue a Supplemental SA (SSA)/Final EIS (FEIS).

This SA/DEIS is a staff document. It is neither a document of the California Energy Commission Siting Committee, a draft decision by the Siting Committee, nor a decision

document approving the right-of-way grant by BLM. The SA/DEIS describes and evaluates the following:

- the proposed project;
- the existing environment;
- whether the facilities can be constructed and operated safely and reliably in accordance with applicable laws, ordinances, regulations, and standards (LORS);
- the environmental consequences of the proposed project including potential public health and safety impacts;
- the potential cumulative impacts of the proposed project in conjunction with other existing and known planned developments;
- mitigation measures proposed by the applicant, staff, interested agencies, local organizations, and interveners which may lessen or avoid potential impacts;
- the proposed conditions under which the project should be constructed and operated, if it is certified (known as “conditions of certification”); and
- alternatives to the proposed project.

The analyses contained in this SA/DEIS are based upon information from the: 1) Application for Certification (AFC), 2) responses to data requests, 3) supplementary information from local, state, and federal agencies; interested organizations; and individuals, 4) existing documents and publications, 5) independent research, and 6) comments at workshops. The SA/DEIS presents conclusions about potential environmental impacts and conformity with LORS, as well as proposed conditions of certification/mitigation measures that apply to the design, construction, operation, and closure of the facility. Each proposed condition of certification/mitigation measure is followed by a proposed means of verification that the condition has been met.

BACKGROUND

Stirling Energy Systems Solar Two LLC’s business model includes the development and deployment of the Stirling solar dish systems (referred to as SunCatchers) technology. It has formed the limited liability corporation Stirling Energy Systems Solar Two (referred to as applicant or SES Solar Two, LLC hereafter) for the purposes of filing ROW applications with the BLM for the use of public land and for filing an AFC with the Energy Commission. SES Solar Two, LLC has executed Power Purchase Agreements and interconnection agreements with San Diego Gas and Electric (SDG&E) to deliver 750 megawatts (MW) of electricity to the California market.

The applicant has applied for a ROW grant from the BLM to construct the SES Solar Two Project that will occupy 6,140 acres of federal land managed by the BLM and approximately 360 acres of privately owned land, use approximately 32 acre feet of water per year, produce a nominal 750 MW of electricity, and operate for a term of 40 years. SES Solar Two, LLC has also filed an AFC with the Energy Commission. Under California law, the Energy Commission has regulatory authority for certifying applications for thermal power generating facilities in excess of 50 MW in size.

Additionally, the applicant has applied to the DOE for a loan guarantee pursuant to Title XVII of the Energy Policy Act of 2005 (EPAct). The application currently under review for a loan guarantee for the SES Solar Two Project was made September 14, 2009. The EPAct established a Federal loan guarantee program for eligible energy projects that employ innovative technologies. Title XVII of EPAct authorizes the Secretary of Energy to make loan guarantees for a variety of types of projects, including those that "avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases, and employ new or significantly improved technologies as compared to commercial technologies in service in the U.S. at the time the guarantee is issued." The two principal goals of the loan guarantee program are to encourage commercial use in the U.S. of new or significantly improved energy-related technologies and to achieve substantial environmental benefits. DOE can comply with the requirements under EPAct by selecting eligible projects that meet the goals of the Act. DOE is using this NEPA process to assist in determining whether to issue a loan guarantee to SES Solar Two, LLC to support the proposed project.

The proposed project could help meet the explicit policy goals of the State of California and the Federal goals of producing 10% of the nation's electricity from renewable sources by 2012 and 25% by 2025. Authorities include:

- Executive order 13212, dated May 18, 2001, which mandates that agencies act expediently and in a manner consistent with applicable laws to increase the "production and transmission of energy in a safe and environmentally sound manner."
- The EPAct, which requires the Department of the Interior (BLM's parent agency) to approve at least 10,000 MW of renewable energy on public lands by 2015.
- Secretarial Order 3285, dated March 11, 2009, which "establishes the development of renewable energy as a priority for the Department of the Interior."

A.1 AGENCY AUTHORITIES AND RESPONSIBILITIES

The Energy Commission has the exclusive authority to certify the construction, modification, and operation of thermal electric power plants 50 MW or larger. The Energy Commission certification is in lieu of any permit required by state, regional, or local agencies and by federal agencies to the extent permitted by federal law (Pub. Resources Code, § 25500). The Energy Commission must review power plant AFCs to assess potential environmental impacts including potential impacts to public health and safety, and potential measures to mitigate those impacts (Pub. Resources Code, § 25519), and compliance with applicable governmental laws or standards (Pub. Resources Code, § 25523 (d)). The Energy Commission staff's analyses were prepared in accordance with Public Resources Code, section 25500 et seq.; Title 20, California Code of Regulations, section 1701 et seq.; and CEQA (Pub. Resources Code, § 21000 et seq.).

The BLM's authority for the proposed action includes Federal Land Policy and Management Act (FLPMA) of 1976 [43 United States Code (U.S.C.) 1701 et seq.], Section 211 of the EPAct (119 Stat. 594, 600), and BLM's Solar Energy Development Policy of April 4, 2007. The FLPMA authorizes BLM to issue right-of-way (ROW) grants for renewable energy projects. Section 211 of the EPAct states that the Secretary of the Interior should seek to have approved a minimum of 10,000 MW of renewable energy generating capacity on public lands by 2015.

Title XVII of EPAct authorizes the Secretary of Energy to make loan guarantees for eligible projects, including those that "avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases, and employ new or significantly improved technologies as compared to commercial technologies in service in the U.S. at the time the guarantee is issued." SES Solar Two, LLC has applied to the DOE for a loan guarantee pursuant to Title XVII of the EPAct. DOE is participating in the review of this NEPA document as a cooperating agency (40 CFR §1508.5) to ensure that analyses needed to support its decision-making on whether to provide a loan guarantee to SES Solar Two, LLC are provided in the EIS.

Section 404 of the CWA authorizes the Secretary of the Army, acting through the USACE, to issue permits regulating the discharge of dredged or fill material into the waters of the U.S. Waters of the U.S. are broadly defined in Code of Federal Regulations (CFR), title 33, section 328.3, subdivision (a), to include navigable waters, perennial, intermittent, and ephemeral streams, lakes, rivers, ponds, as well as wetlands, marshes, and wet meadows.

A.2 PROJECT DESCRIPTION (CASE AND PROPERTY DESCRIPTION)

The proposed action is designated by BLM as ROW serial number CACA-47740.

The following sections or portions of sections in Township 16 of the San Bernardino Meridian identify the project site and the planned boundary for development of the SES Solar Two Project.

Within Township 16 South, Range 11 East of the San Bernardino Meridian defined by:

- the portion of Section 7 south of the railroad ROW,
- the portion of the southwest quarter section and the north half of the southeast quarter section of Section 9 south of the railroad ROW,
- the southeast quarter-quarter section of the northeast quarter section and the east half of the southeast quarter section of Section 14 north of the I-8 ROW and east of Dunaway Road,
- the southwest, northwest, and southeast quarter-quarter sections of the southwest quarter section of Section 15, and the southwest quarter-quarter of the southeast quarter section of Section 15,
- the northwest quarter and southeast quarter of Section 16,
- all of Section 17,
- Section 18, excluding the southwest and southeast quarter-quarter sections of the northeast quarter section,
- the northwest quarter and the portion of the west half of the southwest quarter of Section 19 north of the I-8 ROW,
- the portion of Sections 20 and 21 north of the I-8 ROW, and
- the portion of the north half of the northwest quarter section and the northwest quarter-quarter section of the northeast quarter section of Section 22 north of the I-8 ROW.

Township 16 South, Range 10 East defined by:

- the portions of Sections 12, 13, and 14 south of the railroad ROW,
- the portions of Section 22 south of the railroad ROW,
- all of Sections 23 and 24, and
- the portions of Sections 25, 26, and 27 north of the I-8 ROW.

A.3 LAND USE PLAN CONFORMANCE AND AMENDMENT

The principal land use plan affecting this proposed project is the U.S. Bureau of Land Management's California Desert Conservation Area (CDCA) Plan of 1980, as amended. In the CDCA Plan, the location of the proposed SES Solar Two facility includes land that is classified as Multiple-Use Class L (Limited Use). The Plan states that solar power facilities may be allowed within Limited Use areas after NEPA requirements are met. This DEIS acts as the mechanism for complying with those NEPA requirements.

Because solar power facilities are an allowable use of the land as it is classified in the CDCA Plan, the proposed action does not conflict with the Plan. However, Chapter 3, "Energy Production and Utility Corridors Element" of the Plan also requires that newly proposed power facilities that are not already identified in the Plan be considered through the Plan Amendment process. The proposed SES Solar Two facility is not currently identified within the Plan, and therefore a Plan Amendment is required to include the facility as a recognized element within the Plan.

Land within Imperial County is classified according to Land Use Zoning Designations under the Imperial County General Plan, and Land Use Zoning Districts under the County Development Code. The Development Code implements the General Plan by regulating the use of land within unincorporated portions of the County. The Development Code identifies the land area of the proposed SES Solar Two facility as Open Space Preservation Zone, a designation that does not allow use for electric power generation.

Planning Criteria (BLM)

The CDCA Plan planning criteria are the constraints and ground rules that guide and direct the development of the Plan Amendment. They ensure that the Plan Amendment is tailored to the identified issues and ensure that unnecessary data collection and analyses are avoided. They focus on the decisions to be made in the Plan Amendment, and will achieve the following:

"Sites associated with power generation of transmission not identified in the Plan will be considered through the Plan Amendment process."

Because the proposed facility is not currently identified within the CDCA Plan, an amendment to identify the proposed facility within the Plan is hereby proposed. As specified in Chapter 7, Plan Amendment Process, there are three categories of Plan Amendments, including:

- Category 1, for proposed changes that will not result in significant environmental impact or analysis through an EIS;

- Category 2, for proposed changes that would require a significant change in the location or extent of a multiple-use class designation; and
- Category 3, to accommodate a request for a specific use or activity that will require analysis beyond the Plan Amendment Decision.

Based on these criteria, approval of the proposed project would require a Category 3 amendment. This section summarizes the procedures necessary to evaluate the proposed Plan Amendment, as well as the procedures required to perform the environmental review of the ROW application.

Statement of Plan Amendment. The Implementation section of the Energy Production and Utility Corridors Element of the CDCA Plan lists a number of Category 3 amendments that have been approved since adoption of the Plan in 1980. An additional amendment is proposed to be added to this section of the Plan, and would read "Permission granted to construct solar energy facility (proposed SES Solar Two Project)."

Plan Amendment Process. The Plan Amendment process is outlined in Chapter 7 of the Plan. In analyzing an applicant's request for amending or changing the Plan, the BLM District Manager, Desert District, will:

1. Determine if the request has been properly submitted and if any law or regulation prohibits granting the requested amendment.
2. Determine if alternative locations within the CDCA are available which would meet the applicant's needs without requiring a change in the Plan's classification, or an amendment to any Plan element.
3. Determine the environmental effects of granting and/or implementing the applicant's request.
4. Consider the economic and social impacts of granting and/or implementing the applicant's request.
5. Provide opportunities for and consideration of public comment on the proposed amendment, including input from the public and from federal, State, and local government agencies.
6. Evaluate the effect of the proposed amendment on BLM management's desert-wide obligation to achieve and maintain a balance between resource use and resource protection.

Decision Criteria for Evaluation of Proposed Plan Amendment. The Decision Criteria to be used for approval or disapproval of the proposed amendment require that the following determinations be made by the BLM Desert District Manager:

1. The proposed amendment is in accordance with applicable laws and regulations;
2. The proposed amendment will provide for the immediate and future management, use, development, and protection of the public lands within the CDCA.

The BLM Desert District Manager will base the rationale for these determinations on the principles of multiple uses, sustained yield, and maintenance of environmental quality as required in FLPMA.

Decision Criteria for Evaluation of Application. In addition to defining the required analyses and Decision Criteria for Plan Amendments, the Plan also defines the Decision Criteria to be used to evaluate future applications in the Energy Production and Utility Corridors Element of Chapter 3. These Decision Criteria include:

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; and
9. Consider corridor networks which take into account power needs and alternative fuel resources.

Factors to be Considered. The Plan also states that, in the evaluation of proposed power plants, BLM will use the same factors affecting the public lands and their resources as those used by the Energy Commission. These factors are the environmental information requirements defined in the California Code of Regulations (CCR) Title 20, Appendix B, and include:

- General (Project Overview)
- Cultural Resources
- Land Use
- Noise
- Traffic and Transportation
- Visual Resources
- Socioeconomics
- Air Quality
- Public Health
- Hazardous Materials Handling
- Worker Safety
- Waste Management
- Biological Resources
- Water Resources
- Soils
- Paleontological Resources
- Geological Hazards and Resources
- Transmission System Safety and Nuisance
- Facility Design
- Transmission System Design
- Reliability
- Efficiency

The specific determinations required for the Plan Amendment evaluation are discussed in detail below. This DEIS acts as the mechanism for evaluating both the proposed project application, and the proposed Plan Amendment. The factors specified in CCR Title 20, Appendix B are included within the scope of the analysis presented in the DEIS.

Results of CDCA Plan Amendment (BLM)

Required Determinations

1. Determine if the request has been properly submitted and if any law or regulation prohibits granting the requested amendment.

   The applicant's request for a ROW was properly submitted, and this DEIS acts as the mechanism for evaluating and disclosing environmental impacts associated with that applications. No law or regulation prohibits granting the amendment.

2. Determine if alternative locations within the CDCA are available which would meet the applicant's needs without requiring a change in the Plan's classification, or an amendment to any Plan element.

   The CDCA Plan does not currently identify any sites as solar generating facilities. Therefore, there is no other location within the CDCA which could serve as an alternative location without requiring a Plan Amendment. The proposed project does not require a change in the Multiple-Use Class classification for any area within the CDCA.

3. Determine the environmental affects of granting and/or implementing the applicant's request.

   This DEIS acts as the mechanism for evaluating the environmental effects of granting the ROW and the Plan Amendment.

4. Consider the economic and social impacts of granting and/or implementing the applicant's request.

   This DEIS acts as the mechanism for evaluating the economic and social impacts of granting the ROW and the Plan Amendment.

5. Provide opportunities for and consideration of public comment on the proposed amendment, including input from the public and from federal, State, and local government agencies.

   A Notice of Intent (NOI) to amend the CDCA Plan was published in the Federal Register October 17, 2008, Vol. 73, No. 202 Fed. Reg.61902-61903. The U.S. Environmental Protection Agency provided comments during the 30-day NOI scoping period. In accordance with the NOI, issues identified during the scoping period are placed in the comment categories below.

6. Issues to be resolved in the plan amendment:

   Several comments were received with concerns over the loss of open space and recreational lands if the plan was amended to allow industrial use. This comment is being resolved through this Plan Amendment.

7. Issues to be resolved through policy or administrative action:

   All other comments received addressed specific environmental impacts and mitigation measures that each commenter requested be analyzed in the SA/DEIS. These comments are being resolved by being considered within this DEIS.

8. Issues beyond the scope of this plan amendment:

   No comments were received which were outside of the scope of this Plan Amendment.

9. Evaluate the effect of the proposed amendment on BLM management's desert-wide obligation to achieve and maintain a balance between resource use and resource protection.

   The balance between resource use and resource protection is evaluated within the DEIS. Title VI of the FLPMA, under CDCA, provides for the immediate and future protection and administration of the public lands in the California desert within the framework of a program of multiple use and sustained yield, and maintenance of environmental quality. Multiple use includes the use of renewable energy resources, and through Title V of FLPMA, the BLM is authorized to grant ROWs for generation and transmission of electric energy. The acceptability of use of public lands within the CDCA for this purpose is recognized through the Plan's approval of solar generating facilities within Multiple-Use Class L. The purpose of the DEIS is to identify resources which may be adversely impacted by approval of the proposed project, evaluate alternative actions which may accomplish the purpose and need with a lesser degree of resource impacts, and identify mitigation measures and Best Management Practices (BMPs) which, when implemented, would reduce the extent and magnitude of the impacts and provide a greater degree of resource protection.

<u>Conformance of ROW Application with Decision Criteria (BLM)</u>

1. Minimize the number of separate ROWs by utilizing existing ROWs as a basis for planning corridors:

   The proposed project assists in minimizing the number of separate ROWs by being proposed largely within existing Corridor N. Electrical transmission associated with the proposed project will occur within these existing corridors, and placement of the facility adjacent to these corridors minimizes the length of new corridors necessary for transmission of natural gas to the site.

2. Encourage joint-use of corridors for transmission lines, canals, pipelines, and cables:

   Placement of the proposed project within existing Corridor N maximizes the joint-use of this corridor for natural gas and electrical transmission.

3. Provide alternative corridors to be considered during processing of applications:

   This decision criterion is not applicable to the proposed project. Placement of the proposed facility adjacent to existing corridors does not require designation of alternative corridors to support the proposed project.

4. Avoid sensitive resources wherever possible:

   The extent to which the proposed project has been located and designed to avoid sensitive resources is addressed throughout the DEIS. BLM and other Federal regulations that restrict the placement of proposed facilities, such as the presence of designated Wilderness Areas or Desert Wildlife Management Areas were

considerations in the original siting process used by the applicant to identify potential project locations. The project location and configurations of the boundaries were modified in consideration of mineral resources. The alternatives analysis considered whether the purpose and need of the proposed project could be achieved in another location, but with a lesser effect on sensitive resources.

5. Conform to local plans whenever possible:

   The extent to which the proposed project conforms to local plans is addressed within the Land Use section of the DEIS. The proposed project is in conformance with the Imperial County General Plan.

6. Consider wilderness values and be consistent with final wilderness recommendations:

   The proposed project is not located within a designated Wilderness Area or Wilderness Study Area.

7. Complete the delivery systems network:

   This decision criterion is not applicable to the proposed project.

8. Consider ongoing projects for which decisions have been made:

   This decision criterion is not applicable to the proposed project. Approval of the proposed project would not affect any other projects for which decisions have been made.

9. Consider corridor networks which take into account power needs and alternative fuel resources:

   This decision criterion is not applicable to the proposed project. The proposed project does not involve the consideration of an addition to or modification of the corridor network. However, it does utilize facilities located within Corridor N, which were designed with consideration of both power needs and locations of alternative fuel resources.

A.4 PROJECT OBJECTIVES (CEQA)

APPLICANT OBJECTIVES

The applicant's project objectives are set forth below. The fundamental objective is to build a solar project that generates 750 MW of renewable solar energy that will help the State meet its Renewable Portfolio Standard (RPS) goals for new renewable electric generation. To assist in meeting the requirement for additional generating capacity, the applicant has developed solar technology which requires commercial-scale development to demonstrate its technical and commercial viability, and has entered into power purchase agreements to provide power from renewable sources into the California Independent System Operator (CAISO) system.

- Provide up to 750 MW of renewable electric capacity under a 20-year PPA to SDG&E,
- Contribute to the 20% renewables RPS target set by California's governor and legislature,
- Assist in reducing greenhouse gas emissions from the electricity sector,
- contribute to California's future electric power needs, and
- Assist the CAISO in meeting its strategic goals for the integration of renewable resources, as listed in its Five-Year Strategic Plan for 2008-2012 (CAISO 2007).

CEQA OBJECTIVES

State Objectives

Senate Bill 1078, passed on 2002, established the California RPS, which requires utilities to increase their sale of electricity produced by renewable energy sources, including solar facilities, by a minimum of 1% per year with a goal of 20% of their total sales by 2017. However, the California Public Utilities Commission (CPUC), Energy Commission, and the California Power Authority adopted the Energy Action Plan (EAP), which pledged that the agencies would meet an accelerated goal of 20% by the year 2010. As a result, the California Senate passed Senate Bill 107 to be consistent with the EAP, and accelerated the implementation of RPS, requiring utilities to meet the goal of 20% renewable energy generation by 2010. In November 2008, California's Governor instituted Executive Order S-14-08 which establishes an updated RPS goal that all retail sellers of electricity shall serve 33% of their load with renewable energy by 2020. The project would allow California utilities to increase the percentage of renewable resources in their energy portfolio, and aid the utilities in reaching the goals set forth by the RPS.

CEQA guidelines require a clearly written statement of objectives to guide the lead agency in developing a reasonable range of alternatives and aid decision-makers in preparing findings or a statement of overriding considerations. CEQA specifies that the statement of objectives should include the underlying purpose of the project (Section

15126.6(a)).These objectives reflect the applicant's objectives and the BLM's stated purpose and need of the project and will be considered in the comparison of alternatives, as required under both NEPA and CEQA. The Energy Commission developed the following objectives for the project:

1. to safely and economically construct and operate an up to 750 MW, renewable power generating facility in California capable of selling competitively priced renewable energy consistent with the needs of California utilities;

2. to locate the facility in areas of high solarity with ground slope of less than 5%;

3. to complete the impact analysis of the project so that if approved, construction could be authorized in 2010 and beyond.

A.5 PURPOSE AND NEED (NEPA)

BLM PURPOSE AND NEED

NEPA guidance published by the Council on Environmental Quality (CEQ) states that environmental impact statements' Purpose and Need section "shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action" (40 CFR §1502.13). The following discussion sets forth the purpose of, and need for, the project as required under NEPA.

The BLM's purpose and need for the SES Solar Two Project is to respond to SES Solar Two, LLC's application under Title V of FLPMA (43 U.S.C. 1761) for a ROW grant to construct, operate, and decommission a solar thermal facility on public lands in compliance with FLPMA, BLM ROW regulations, and other Federal applicable laws. The BLM will decide whether to approve, approve with modification, or deny issuance of a ROW grant to SES Solar Two, LLC for the proposed SES Solar Two Project. The BLM's actions will also include consideration of amending the CDCA Plan concurrently. The CDCA Plan (1980, as amended), 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 that plan be considered through the plan amendment process. If the BLM decides to approve the issuance of a ROW grant, the BLM will also amend the CDCA Plan as required.

In conjunction with FLPMA, BLM authorities include:

- Executive order 13212, dated May 18, 2001, which mandates that agencies act expediently and in a manner consistent with applicable laws to increase the "production and transmission of energy in a safe and environmentally sound manner."
- The EPAct, which requires the Department of the Interior (BLM's parent agency) to approve at least 10,000 MW of renewable energy on public lands by 2015.
- Secretarial Order 3285, dated March 11, 2009, which "establishes the development of renewable energy as a priority for the Department of the Interior."

DOE PURPOSE AND NEED

The EPAct of 2005 established a Federal loan guarantee program for eligible energy projects that employ innovative technologies. Title XVII of the EPAct authorizes the Secretary of Energy to make loan guarantees for a variety of types of projects, including those that "avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases, and employ new or significantly improved technologies as compared to commercial technologies in service in the U.S. at the time the guarantee is issued."

The two purposes of the loan guarantee program are to encourage commercial use in the U.S. of new or significantly improved energy-related technologies and to achieve substantial environmental benefits. The purpose and need for action by DOE is to comply with its mandate under EPAct by selecting eligible projects that meet the goals of the Act.

USACE PURPOSE AND NEED

The USACE uses two purpose and need statements to identify and analyze a reasonable range of alternatives under Section 404(b)(1). These include the basic project purpose and the overall project purpose.

The basic project purpose is used to determine whether a proposed project is water dependent (i.e., whether it requires a location that affects waters of the U.S.). The basic project purpose comprises the fundamental, essential, or irreducible purpose of the Preferred Action Alternative, and is used by the USACE to determine whether the applicant's project is water dependent.

The basic project purpose for the Preferred Plan Alternative is: "***Energy Production**."*

The basic project purpose is not water dependent but will affect waters of the U.S. in the form of ephemeral streams and therefore, the applicant has the burden of rebutting the presumption that there is a less damaging alternative for the proposed activity that would not affect waters of the U.S. {§40 CFR 230.10(a)(3.)}.

The overall project purpose is the basic project purpose with consideration of costs and technical and logistical feasibility.

The *overall project purpose* is ***"To provide a renewable energy facility in Southern California**.*"

A.6 PROJECT EVALUATION AND DECISION PROCESS

Energy Commission Process

The Energy Commission's siting regulations require staff to independently review the AFC and assess whether the list of environmental impacts contained is complete and whether additional or more effective mitigation measures are necessary, feasible, and available (Cal. Code Regs., tit. 20, §§ 1742 and 1742.5(a)).

In addition, staff must assess the completeness and adequacy of the measures proposed by the applicant to ensure compliance with health and safety standards and the reliability of power plant operations (Cal. Code Regs., tit. 20, § 1743(b)). Staff is required to develop a compliance plan (coordinated with other agencies) to ensure that applicable laws, ordinances, regulations, and standards are met (Cal. Code Regs., tit. 20, § 1744(b)).

Staff conducts its environmental analysis in accordance with the requirements of the CEQA. No additional EIR is required because the Energy Commission's site certification program has been certified by the California Resources Agency as meeting all requirements of a certified regulatory program (Pub. Resources Code, § 21080.5 and Cal. Code Regs., tit. 14, § 15251 (j)).

Staff's impact assessment, including the recommended conditions of certification, is only one piece of evidence that the Siting Committee will consider in reaching a decision on the proposed project and making its recommendation to the full Energy Commission. At the public hearings, all parties will be afforded an opportunity to present evidence

and to rebut the testimony of other parties, thereby creating a hearing record on which a decision on the project can be based. The hearing before the Siting Committee also allows all parties to argue their positions on disputed matters, if any, and it provides a forum for the Committee to receive comments from the public and other governmental agencies.

Following the hearings, the Siting Committee's recommendation to the full Energy Commission on whether or not to approve the proposed project will be contained in a document entitled the Presiding Members' Proposed Decision (PMPD). Following its publication, the PMPD is circulated in order to receive written public comments. At the conclusion of the comment period, the Siting Committee may prepare a revised PMPD. At the close of the comment period for the revised PMPD, the PMPD is submitted to the full Energy Commission for a decision.

BLM Process

The DEIS is available for a 90-day public comment period. Following completion of that period, BLM will review and develop responses to comments provided by the public and other agencies. The responses to the comments, and other information identified during this period, will be incorporated into a FEIS, which will make a recommendation regarding the preferred alternative. A Notice of Availability (NOA) of the FEIS will be published when the FEIS becomes available for public review. The FEIS will be available for public review for a minimum of 30-days before the BLM issues a Record of Decision (ROD). The decision regarding the ROW grant is in full force and effect; however, it is appealable to the Interior Board of Land Appeals upon issuance of the ROD. The FEIS will also contain a proposed decision to amend the BLM Plan. Proposed plan amendment decisions may be protested within 30-days of the proposed decision. BLM cannot make a final decision regarding issuance of a ROW grant or amending the Plan until any Plan protest is resolved.

Under the NEPA process, the significance of the impacts is developed based on the definition of "significantly" provided in NEPA regulations Section 1508.27. This evaluation includes both the context of the action with respect to the affected resources, as well as the intensity of the effect on those resources. The following are considered in evaluating the intensity:

- Whether the impact is beneficial or adverse;
- The degree to which the proposed action affects public health or safety;
- Unique characteristics of the geographic area, including parks, farmlands, wetlands, wild and scenic rivers, or ecologically critical areas;
- The degree to which the effects are likely to be highly controversial;
- The degree to which the effects are highly uncertain or involve unique or unknown risks;
- The degree to which the action may establish a precedent for future actions;
- Whether the action may be individually insignificant, but cumulatively significant when combined with other actions;

- The degree to which the action may adversely affect significant scientific, cultural, or historical resources;
- The degree to which the action may adversely affect an endangered or threatened species or its habitat; and
- Whether the action threatens a violation of federal, State, or local law or requirements imposed for the protection of the environment.

As outlined in NEPA regulations Section 1502.16, the analysis also includes a discussion of both direct and indirect effects and their significance, adverse environmental effects which cannot be avoided, whether impacts are short-term or long-term, and any irreversible or irretrievable commitments of resources.

The decisions to be made by the agencies (licensing by the Energy Commission, and ROW grant by BLM) are independent of each other.

DOE Process

When the FEIS is completed and made available to the public by BLM, DOE will carry out an independent review to ensure that DOE comments have been addressed and that the proposed action is substantially the same as the action described in the EIS. If these conditions are met, DOE will adopt the FEIS without having to recirculate it pursuant to CEQ NEPA regulations at 40 CFR 1506.3(c).

While the FEIS is being developed, DOE will also be carrying out a detailed technical and legal evaluation of the proposed project pursuant to its procedures for loan guarantees set out at 10 CFR Part 609. DOE may reach agreement on a conditional commitment for a loan guarantee prior to completion of the FEIS and the BLM ROW grant; however, in this case a condition precedent will be included in the conditional commitment requiring that the NEPA review and the BLM ROW grant process be completed before DOE closes the loan guarantee transaction.

Following conclusion of the NEPA process and the BLM decision on issuance of the ROW grant, DOE will issue a Record of Decision (ROD) and proceed to close the loan guarantee transaction provided that the applicant has satisfied all the detailed terms and conditions contained in the conditional commitment and other related documents, and all other contractual, statutory, and regulatory requirements.

USACE Process

Section 404 of the CWA authorizes the Secretary of the Army, acting through the Corps, to issue permits regulating the discharge of dredged or fill materials into the "navigable waters at specified disposal sites." Section 502 of the CWA further defines "navigable waters" as "waters of the United States, including territorial seas." "Waters of the United States" are broadly defined in Code of Federal Regulations (C.F.R.), title 33, section 328.3,

subdivision (a),[1] to include navigable waters, perennial, intermittent, and ephemeral streams, lakes, rivers, ponds, as well as wetlands, marshes, and wet meadows. Section 328.3, subdivision (a) specifically defines "waters of the United States," as follows:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

2. All interstate waters including interstate wetlands;

3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:

   i. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or

   ii. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

   iii. Which are used or could be used for industrial purpose by industries in interstate commerce;

4. All impoundments of waters otherwise defined as waters of the United States under the definition;

5. Tributaries of waters identified in paragraphs (a)(1)-(4) of this section;

6. The territorial seas;

7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a)(1)-(6) of this section.

8. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 C.F.R. 123.11(m) which also meet the criteria of this definition) are not waters of the United States.

The lateral limits of the Corps' jurisdiction in non-tidal waters under Section 404 of the Clean Water Act are defined by the "ordinary high-water mark" (OHWM) unless adjacent wetlands are present. The OHWM is a line on the shore or edge of a channel established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed upon the bank, shelving, changes in the character of soil,

[1] This regulation, 33 C.F.R., §328.3, and the definitions contained therein, have been the subject of recent litigation. In addition, the United States Supreme Court has recently limited the scope and extent of the Corps' jurisdiction over "navigable waters" and "waters of the United States" under the CWA. (See, *e.g.*, *Solid Waste Agency of Northern Cook Cty. v. United States Army Corps of Engineers* (2001) 531 United States 159; *Rapanos v. United States* (2006) 126 S.Ct. 2208 Despite the impacts of these recent decisions, the definitions continue to provide guidance to the extent that they establish an outer limit on the Corps' jurisdiction over "waters of the United States," and, therefore, are referenced here for that purpose.

destruction of vegetation, or the presence of debris. (33 C.F.R., §328.3, subd. (e).) As such, waters are recognized in the field by the presence of a defined watercourse with appropriate physical and topographic features. If wetlands occur within, or adjacent to, waters of the United States, the lateral limits of the Corps' jurisdiction will extend beyond the OHWM to the outer edge of the wetlands (33 C.F.R. §328.4(c)).The upstream limit of jurisdiction in the absence of adjacent wetlands is the point beyond which the OHWM is no longer perceptible. (33 C.F.R., §328.4; see also 51 Fed. Reg., §41217.)

The CWA Section 404(b)(1) Guidelines govern the issuance of permits authorizing the placement of fill material into waters of the United States, and state that no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences. (40 C.F.R., §230.10, subd. (a).)

Under the Section 404(b)(1) Guidelines, the applicant must demonstrate avoidance or minimization of impacts to waters of the United States to the maximum extent practicable. Under the above requirements, the Corps can only issue a Section 404 Permit for the "least environmentally damaging practicable alternative" (LEDPA). In addition, the Corps is prohibited from issuing a permit that is contrary to the public interest. (33 C.F.R., §320.4.)

The section 404(b)(1) Guidelines also extend additional protection to certain rare and/or sensitive aquatic habitats. These are termed "special aquatic sites," and include six categories: sanctuaries and refuges, wetlands, mudflats, vegetated shallows, coral reefs, and riffle/pool complexes. (40 C.F.R., §§230.40-230.45.) For proposed activities involving discharges into special aquatic sites, the Section 404(b)(1) Guidelines require consideration of whether the activity is dependent on access or proximity to, or siting within, a special aquatic site in order to fulfill its basic project purpose. If an activity is determined not to be water dependent, the Section 404(b)(1) Guidelines establish the following two presumptions (40 C.F.R., §230.10, subd. (a)(3)), which the applicant is required to rebut in addition to satisfying the alternatives analysis requirements:

That practicable alternatives not involving discharges of fill material into special aquatic sites are presumed to be available; and

That all practicable alternatives to the proposed discharge not involving a discharge into a special aquatic site are presumed to have less adverse impacts on the aquatic ecosystem.

For non-water-dependent projects, the applicant must rebut these presumptions in order to demonstrate compliance with the Section 404(b)(1) Guidelines.

Section 401 of the CWA requires that an applicant for a federal permit (including a Section 404 Permit) for an activity that may result in any discharge into navigable waters provide state certification that the proposed activity will not violate state and federal water quality standards.

The USACE’s assessment of the project and alternatives also emphasizes avoidance and minimization of impacts to waters of the United States, including all special aquatic

sites in the project area. The above assessment method for evaluating temporary and permanent impacts to the physical and biological attributes of the aquatic environment will also be utilized for the required 404(b)(1) alternatives analysis (40 CFR 230). The evaluation of impacts and the development of appropriate mitigation measures in this section will also be used to demonstrate compliance with the Mitigation Rule (33 CFR Parts 325 and 332). As discussed in the Mitigation Rule, the USACE will consider a variety of methods to ensure that any required compensatory mitigation for impacts to jurisdictional waters of the United States provides adequate compensation for the loss of physical and biological functions and services in the project area. To address temporal impacts and to increase the level of certainty associated with any required compensatory mitigation, the USACE would require up-front compensatory mitigation at a minimum 1:1 ratio of functional units lost prior to any permanent impacts to waters of the United States as well as concurrent mitigation throughout construction activities in jurisdictional areas associated with the Project and alternatives.

A.7 AGENCY AND PUBLIC COORDINATION

As noted previously, the Energy Commission certification is in lieu of any permit required by state, regional, or local agencies and by federal agencies to the extent permitted by federal law (Pub. Resources Code, § 25500). However, both the Energy Commission and BLM typically seek comments from and work closely with other regulatory agencies that administer LORS that may be applicable to the proposed project. The following paragraphs describe the agency coordination that has occurred through this joint SA/EIS process.

U.S. Army Corps of Engineers

The Corps has jurisdiction to protect water quality and wetland resources under Section 404 of the CWA. Under CWA authority, the Corps reviews proposed projects to determine whether they may impact such resources, and/or be subject to a Section 404 permit. Throughout the SA/DEIS process, the Energy Commission, BLM, and the applicant have provided information to the Corps to assist them in making a determination regarding their jurisdiction and need for a Section 404 permit. The Corps determined that the proposed SES Solar Two Project would result in fill of waters of the U.S. and would require a Standard Individual Permit (SIP) subject to CWA Section 404(b)(1) guidelines.

U.S. National Park Service

The National Park Service manages the Juan Bautista de Anza National Historic Trail, which is believed to cross the proposed project area. Because of the potential impacts to the Juan Bautista de Anza National Historic Trail, the Park Service was invited to participate review and provide comment on the SA/DEIS. On December 18, 2009, the National Park Service accepted the BLM invitation to become an Invited Signatory and consulting party in the development of a Programmatic Agreement for the SES Solar Two Project. The National Park Service has special interest in ensuring the protection of the historic properties on the proposed project site, including the Juan Bautista de Anza National Historic Trail.

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (USFWS) has jurisdiction to protect threatened and endangered species under the Endangered Species Act (ESA). Formal consultation with the USFWS under Section 7 of the ESA is required for any federal action that may adversely affect a federally-listed species. The endangered peninsular bighorn sheep (*Ovis canadensis nelsoni*) has been observed on the project site, as well as the flat-tailed horned lizard (*Phrynosoma mcallii)*. Though the flat-tailed horned lizard found is not currently listed, the USFWS had been recently instructed by a federal district court to reinstate the proposal to list the flat-tailed horned lizard under the federal Endangered Species Act (FESA). Therefore, formal consultation with the USFWS is not required; however, conference has been initiated by the BLM through the preparation and submittal of a Biological Assessment (BA) which describes the proposed project to the USFWS. Following review of the BA, the USFWS is expected to issue a Biological Opinion (BO) for the peninsular bighorn sheep and a Conference Opinion for the flat-tailed horned lizard, which will specify mitigation measures which must be implemented for the protection of the species.

State Water Resources Control Board/Regional Water Quality Control Board

The Colorado River Regional Water Quality Control Board (RWQCB) has the authority to protect both surface water and groundwater resources at the proposed project location. Throughout the SA/DEIS process, the Energy Commission, BLM, and the applicant have invited the RWQCB to participate in public scoping and workshops, and have provided information to assist the agency in evaluating the potential impacts and permitting requirements of the proposed project. Although the RWQCB has not yet responded with comments on the proposed project, staff has specified conditions to satisfy anticipated requirements of dredge and fill permit/waste discharge requirements. Staff will work with the RWQCB during the comment period to address any necessary changes to the requirements. These requirements will be included as a recommended Condition of Certification/Mitigation Measure.

California Department of Fish and Game

The California Department of Fish and Game (CDFG) have the authority to protect water resources of the state through regulation of modifications to streambeds, under Section 1602 of the Fish and Game Code. The Energy Commission, BLM, and the applicant have provided information to CDFG to assist in their determination of the impacts to streambeds, and identification of permit and mitigation requirements. The applicant filed an application for a Lake and Streambed Alteration Agreement with CDFG on October 30, 2009. The CDFG is currently reviewing the application and working on the requirements of the Streambed Alteration Agreement. These requirements will be included as a recommended Condition of Certification/Mitigation Measure.

Tribal Relationships

The BLM has notified affected Indian Tribes regarding the proposed project, has sought their comments, and has invited them to consult on the project on a government-to-government basis. The affected Indian Tribes are currently working with the BLM, Energy Commission, and the State Historic Preservation Officer’s office on the development of the Programmatic Agreement.

Public Coordination

Both the Energy Commission's CEQA-equivalent process and the BLM's NEPA process provide opportunities for public participation in the scoping of the environmental analysis, and in the evaluation of the technical analyses and conclusions of that analysis. For the Energy Commission, this outreach program is primarily facilitated by the Public Adviser's Office (PAO). As part of the coordination of the environmental review process required under the Energy Commission/BLM California Desert District MOU, the agencies have jointly held public meetings and workshops which accomplish the public coordination objectives of both agencies. This is an ongoing process that to date has involved the following efforts:

Libraries

The AFC was sent to the county libraries in El Centro, Ocotillo, Fresno, and Eureka; the main branches of the San Diego and San Francisco public libraries; the University Research Library at UCLA; the California State Library; and the Energy Commission's library in Sacramento.

Outreach Efforts

The PAO's public outreach is an integral part of the Energy Commission's AFC review process. The PAO reviewed information provided by the applicant and also conducted its own outreach efforts to identify and locate local elected and certain appointed officials, as well as "sensitive receptors" (including schools, community, cultural and health facilities, and daycare and senior-care centers, as well as environmental and ethnic organizations). There were not any sensitive receptors identified within a 6-mile radius of the proposed site for the project.

Notices for workshops and hearings have been and will continue to be distributed to those agencies, individuals, and businesses that are currently on or request to be placed on the project's mailing list. Notices were distributed for the Informational Hearing and Site Visit, which was conducted on November 24, 2008, in El Centro, California.

Coincident with the PAO's outreach efforts, BLM solicited interested members of the public and agencies through the NEPA scoping process. BLM published a NOI to develop the EIS and amend the CDCA Plan in the Federal Register, Vol. 73, and No. 202 Fed. Reg.61902-61903, dated October 17, 2008. The Energy Commission's November 24, 2008 Informational Hearing also acted as the Public Scoping meetings for the EIS, as required by NEPA.

Throughout the 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 December 18, 2008 and May 7, 2009 in El Centro, California, and on February 10, 2009 in Sacramento, California. The Energy Commission has also continued to accept and consider public comments, and has issued orders granting petitions to intervene to the California Unions for Reliable Energy.

Those agencies and individuals that have provided comments concerning the project have been considered in staff's analysis. This SA/DEIS provides agencies and the public with an opportunity to review the Energy Commission staff's analysis of the

proposed project. Comments received on this SA/DEIS will be taken into consideration in preparing the subsequent project documents, including the Supplemental SA/FEIS.

Energy Commission regulations require staff to notice, at a minimum, property owners within 1,000 feet of a project and 500 feet of a linear facility under its jurisdiction. This was done for the SES Solar Two Project. Staff's ongoing public and agency coordination activities for this project are discussed under the Public and Agency Coordination heading in the **Executive Summary**.

The AFC, this SA/DEIS, and other project documents are located on the Energy Commission's website at http://www.energy.ca.gov/sitingcases/solartwo/index.html.

Summary of Public and Agency Comments

The BLM and Energy Commission processes include soliciting comments regarding the scope of the analysis from other government agencies, the public and non-governmental organizations. The persons and organizations which provided scoping comments, and the general issues addressed within their comments, are provided in **Introduction Tables 1 and 2** below.

Introduction Table 1
Summary of Written Comments Received by the Energy Commission

Name and Agency of Commenter (and Date of Comment)	Comment Number	Summary of Comments by Environmental Parameter or Topic	Where the Comments will be Addressed in the Environmental Document
COMMENT LETTERS FROM PUBLIC AGENCIES			
United States Environmental Protection Agency (EPA) (letter dated 11/14/08)	EPA-1	EPA supports the use of renewable energy resources.	See Note 1
	EPA-2	**Purpose and Need:** Provide a clear and objective statement of the project's purpose and need.	Purpose and Need
	EPA-3	**Alternatives:** Provide a robust range of alternatives; explain why some alternatives were eliminated; look at alternative sites, capacities, technologies.	Alternatives
	EPA-4	**Biological Resources:** Address threatened and endangered species in detail, including baseline conditions; how avoidance, minimization, and mitigation measures will protect species; and long-term management and monitoring efforts.	Biological Resources and Areas of Critical Environmental Concern
	EPA-5	**Air Quality:** Detailed discussion of ambient air quality; quantify project emissions; identify emissions sources (mobile, stationary, ground disturbance); identify the need for an Equipment Emissions Mitigation Plan (EEMP) and Fugitive Dust Control Plan during construction.	Air Quality
	EPA-6	**Climate Change:** Address climate change and how climate change could potentially affect the project; identify any climate change benefits of the project.	Air Quality
	EPA-7	**Cumulative Impacts:** Clearly identify resources that may be cumulatively impacted and the geographic area that will be impacted by the project; look at past impacts on resources; identify opportunities to avoid and minimize cumulative impacts.	Cumulative Impacts (in sections by environmental parameter)
	EPA-8	**Water Resources:** Evaluate project need for water and effects on water supply.	Hydrology, Water Use, and Water Quality
	EPA-9	**Groundwater:** Direct and indirect effects on groundwater.	Hydrology, Water Use, and Water Quality
	EPA-10	**Water Resources:** Impacts on springs, open water bodies, other aquatic resources.	Hydrology, Water Use, and Water Quality, and Biological Resources

Name and Agency of Commenter (and Date of Comment)	Comment Number	Summary of Comments by Environmental Parameter or Topic	Where the Comments will be Addressed in the Environmental Document
	EPA-11	**Water Use:** Clarify the water rights permitting process.	Project Description
	EPA-12	**Water Quality:** Potential need for a Section 404 permit.	Hydrology, Water Use, and Water Quality, and Biological Resources
	EPA-13	**Water Quality:** Discuss any Section 303(d) impaired waters in the project area.	Hydrology, Water Use, and Water Quality
	EPA-14	**Consultation with Tribal Governments:** Describe process for and outcome of government-to-government consultation; discuss any National Register of Historic Places properties and any Indian Sacred Sites; and development of a Cultural Resources Management Plan.	Cultural Resources and Native American Values
	EPA-15	**Environmental Justice:** Identify environmental justice populations in the project area and potential impacts of the project on those populations; identify whether the impacts are disproportionate on those populations; discuss any coordination with environmental justice populations.	Socioeconomics and Environmental Justice
	EPA-16	**Recreation:** Address effects of the project on recreational users in the project area, including potential hazards to those users associated with the project facilities; identify appropriate safety precautions.	Land Use
	EPA-17	**Invasive Species:** Address potential for project to introduce invasive species; how they will be controlled; development of an invasive species management plan; and restoration, as appropriate, of native species.	Biological Resources
	EPA-18	**Hazardous Materials and Wastes:** Address the potential for direct, indirect, and cumulative impacts of hazardous wastes generated during project construction and operation; identify types and volumes of wastes; identify handling, storage, disposal, and management plans; alternative industrial processes using less toxic materials should be considered.	Hazardous Materials Management
	EPA-19	**Land Use:** Identify consistency and/or conflicts with federal, State, Tribal, and local land use plans, policies, and controls in the project study area.	Land Use
Imperial Irrigation District (IID) (letter dated 11/24/08) (see Note 3)	IID-1	Supports the proposed SES Solar Two project.	See Note 1

Name and Agency of Commenter (and Date of Comment)	Comment Number	Summary of Comments by Environmental Parameter or Topic	Where the Comments will be Addressed in the Environmental Document
COMMENT LETTERS FROM GROUPS AND ORGANIZATIONS			
El Centro Chamber of Commerce and Visitors Bureau (letter dated 11/24/08) (see Note 3)	ECCC-1	Supports the proposed Solar Two project.	See Note 1
Teri Weiner, Imperial County Projects and Conservation Coordinator, Desert Protective Council (letter dated 12/30/08) (see Note 3)	DPC-1	**Cultural Resources:** Complete surveys of cultural artifacts, sites, and areas in the project area are needed; local archaeologists should be considered; consultation with Native American tribes is needed; need to address cumulative impacts.	Cultural Resources
	DPC-2	**Land Use:** Need to address project and cumulative loss of public lands to other uses (particularly energy projects).	Land Use
	DPC-3	**Biological Resources:** Need to address impacts to sensitive plants and animals; conduct species surveys at appropriate times of the year.	Biological Resources
	DPC-4	**Invasive Species:** Control of invasive species during construction and operation.	Biological Resources
	DPC-5	**Animals and Plants:** Potential impacts of scraping for roads on sensitive and rare plants and animals.	Biological Resources
	DPC-6	**Air Quality:** Air quality (PM_{10} [particulate matter less than 10 microns in size]); prevention of air quality impacts during project construction and operation.	Air Quality
	DPC-7	**Water Supplies/Use:** Impacts on Ocotillo/Nomirage aquifer; overall effect on demand for water.	Hydrology, Water Use, and Water Quality
	DPC-9	**Land Use, Visual, and Noise:** Impacts to community character in the Ocotillo and Nomirage communities; dark skies impacts; noise impacts.	Land Use, Visual Resources, Noise
	DPC-10	**Aviation Impacts:** Air space impacts; glare to pilots.	Health and Safety
	DPC-11	**Recreation:** Address impacts to recreational experience at the Plaster City Open Area, Superstition Hills Recreation Area, Painted Gorge Recreation Area, and Anza-Borrego Desert State Park.	Land Use

Name and Agency of Commenter (and Date of Comment)	Comment Number	Summary of Comments by Environmental Parameter or Topic	Where the Comments will be Addressed in the Environmental Document
Alex Daue, Renewable Energy Coordinator, The Wilderness Society, and Johanna Wald, Senior Attorney, Natural Resources Defense Council (letter dated 12/31/08)	TWS-1	Description of the Wilderness Society and the Natural Resources Defense Council.	See Note 1
	TWS-2	Supports responsible use of renewable energy resources in a responsible manner when on public lands.	See Note 1
	TWS-3	Recommend that United States Department of the Interior, Bureau of Land Management (BLM) continue to improve its right-of-way application process, including appropriate best management practices (BMPs) and addressing the difference between solar development and other uses of right-of-way, and prioritize development on already disturbed lands close to existing transmission facilities.	See Note 1
	TWS-4	**Project Description:** The Solar Two site appears to have potential for developing solar energy with fewer impacts to resources than other areas managed by BLM; should prioritize on already disturbed lands and in proximity to existing transmission lines.	Project Description
	TWS-5	Minimize and mitigate unavoidable impacts to resources and values.	In sections by environmental parameter.
	TWS-6	**Cultural Resources:** Prioritize protection of area's cultural resources; develop strategies to minimize and mitigate unavoidable effects on cultural resources; conduct ongoing consultation with local Native American tribes.	Cultural Resources
	TWS-7	**Biological Resources:** Prioritize protection of species in the project area; analyze project impacts on species; develop BMPs and other steps to minimize and mitigate unavoidable impacts on resources.	Biological Resources
	TWS-8	**Water Supply/Use:** Confirm that the water needed for the project is available and consistent with existing Energy Commission policy.	Hydrology, Water Use, and Water Quality
	TWS-9	**Project Description:** Concerns regarding viability of technology.	Project Description
	TWS-10	**Project Phasing:** Consider granting right-of-way for Phase I only, with Phase II dependent on approval finalization of the Sunrise Powerlink project and resolution of additional issues regarding the Solar Two project.	Project Description
	TWS-11	**Project Phasing:** Consider establishing requirements for a demonstration of technological and economic viability with 3 to 5 years of approval of right-of-way before extending the length of the right-of-way approval.	Project Description
	TWS-12	**Project Description:** Conduct an analysis of the energy return on investment to assess the net energy production value of the project.	Project Description

Name and Agency of Commenter (and Date of Comment)	Comment Number	Summary of Comments by Environmental Parameter or Topic	Where the Comments will be Addressed in the Environmental Document
	TWS-13	**Hazards:** Analyze the potential effects of hydrogen leakage and identify strategies to minimize and mitigate impacts.	Hazardous Materials Management
	TWS-14	**Project Description/Funding:** Want cash bonds to cover future decommis-sioning costs with bonds phased consistent with the project phasing.	Project Description
Edie Harmon, Sierra Club, San Diego Chapter (letter dated 1/2/09) (see Note 4)	SC-1	**Alternatives:** Analyze a range of alternatives to avoid the impacts of the project on cultural resources and to overall reduce the reliance on fossil fuels.	Alternatives
	SC-2	**Alternatives:** Suggest No Project Alternative include other energy-generating options.	Alternatives
	SC-3	**Alternative Use of Funds:** Suggest using money from Solar Two and Sunrise Powerlink projects for conservation and weatherization improvements.	See Note 1
	SC-4	**Alternatives:** Suggest installing units in San Diego County closer to the users of the electricity.	Alternatives
	SC-5	**Alternatives:** Suggest installing units in Imperial County at dispersed locations.	Alternatives
	SC-6	**Alternative Sites:** Suggest looking at alternative sites such as Mesquite Lake that are already disturbed or looking at multiple smaller sites.	Alternatives
	SC-7	**Alternatives:** Use the Stirling SunCatcher dish at existing natural gas or coal-fired power plants.	Alternatives
	SC-8	**Project Description:** Why is the electricity generated by Solar Two not going to be available to IID for use in Imperial County?	Project Description
	SC-9	**Project Description and Air Quality:** How will high winds and fine-grained dust affect the moveable parts of the SunCatcher assembly? How will the assembly be protected from the effects of high winds and dust?	Project Description Air Quality
	SC-10	**Project Description:** What will be the effect of high winds and fine-grained dust on the mean time between failure (MTBF) and the need to clean the mirrors?	Project Description
	SC-11	**Project Description:** What effect will gypsum dust from the US Gypsum Plaster City factory have on the facilities?	Project Description
	SC-12	**Project Description:** What was the MTBF at the New Mexico site? What is the estimated MTBF at the proposed site?	Project Description
	SC-13	**Socioeconomics:** What kind of jobs at what skill levels will be created? Will those jobs be met by existing employees in Imperial County or will they require employees relocating from other areas?	Socioeconomics

Name and Agency of Commenter (and Date of Comment)	Comment Number	Summary of Comments by Environmental Parameter or Topic	Where the Comments will be Addressed in the Environmental Document
	SC-14	**Project Description:** Concern regarding going from small prototype to large-scale commercial facility without an intermediate level of facility or experience.	Project Description
	SC-15	**Phasing:** How will the project be phased?	Project Description
	SC-16	**Project Description:** What factors will contribute to MTBF and ongoing facility maintenance?	Project Description
	SC-17	**Project Description:** How will materials for the project be brought to the site?	Project Description
	SC-18	**Project Description:** How much hydrogen will be stored on site? Where will it be located on site?	Project Description
	SC-19	**Project Funding:** What is the financial experience of the project financial backers for this type of project? Where will all the money come from that is needed for the entire project?	See Note 1
	SC-20	**Project Description/Funding:** Want cash bonds to cover future decommissioning costs; will components have any resale or recycling value; how much material might end up in landfills; who will be responsible for the bond costs?	Project Description
	SC-21	**Project Description:** How will higher summer temperatures in Imperial County affect the system?	Project Description
	SC-22	**Project Description:** How much water will need to be used for mirror cleaning? How much will run off into the ground versus evaporation?	Project Description
	SC-23	**Invasive Species:** Introduction of nonnative invasive species; precautions or mitigation measures needed to prevent invasive species.	Biological Resources
	SC-24	**Project Description:** How will total dissolved solids (TDS) in the wastewater impoundment areas be handled to avoid runoff outside the impoundment areas or becoming airborne as dust; how will TDS be disposed of; how will the impoundment areas be managed and maintained; how will the waste impoundment areas be addressed when the facility is decommissioned, including restoration of the land occupied by the wastewater impoundment areas; what strategies will be in place to minimize attracting birds to the wastewater impoundment areas?	Project Description
	SC-25	**Cultural Resources:** Have all cultural resource studies been evaluated by outside consultants familiar with the area prior to release to the public?	See Note 1
	SC-26	**Cultural Resources:** Address issues related to site potentially being designated as an Area of Traditional Cultural Concern (ATCC).	Cultural Resources

Name and Agency of Commenter (and Date of Comment)	Comment Number	Summary of Comments by Environmental Parameter or Topic	Where the Comments will be Addressed in the Environmental Document
	SC-27	**Cultural Resources:** Seek input from Native American groups and the State Historic Preservation Officer.	Cultural Resources
	SC-28	**Visual Resources:** Effect on visual resources in the area, including potential cumulative effect of this and other projects in the area.	Visual Resources
	SC-29	**Traffic and Land Use:** Traffic study should include traffic associated with Centinela State Prison; the prison should be labeled appropriately on figures.	Traffic and Land Use
	SC-30	**Hazards:** Issues associated with the potential for Valley Fever; risks to project employees and employees/prisoners at Centinela State Prison.	Health and Safety
	SC-31	**Cumulative Impacts:** Consider potential for cumulative impacts of this project and other nonrenewable and renewable energy, and land development projects; cumulative impacts on biological resources, cultural resources, environmental justice, air quality, and recreation uses/users.	Cumulative Impacts (in sections by environmental parameter)
	SC-32	**Seismic:** Potential damage/risks to project associated with seismic activity, including activity on the nearby Elsinore/Laguna Salada fault.	Geologic Stability
Mussey Grade Road Alliance (letter dated 1/2/09)	MG-1	**Scoping:** Requests that this comment letter be included in the scoping record.	Scoping Report
	MG-2	**Other Environmental Document:** Requests that the Final Environmental Impact Report (EIR) for the Sunrise Powerlink project, including its mitigation measures, be incorporated into the record for this project and used to scope the current project.	See Note 2
	MG-3	**Project Description:** Concerns regarding the commercial viability of the proposed Stirling Energy Systems, LLC (SES) technology; will it work; will it hold up to desert weather; not cost competitive.	Project Description
COMMENT LETTERS FROM MEMBERS OF THE GENERAL PUBLIC			
Marilyn Moskowitz (email dated 12/23/08) (see Note 3)	MM-1	Opposed to the Solar Two project.	See Note 1
	MM-2	**Air Quality:** Concerned regarding dust and potential health (asthma) effects on children.	Air Quality
	MM-3	**Water Use:** Objects to the use of drinkable water from the Ocotillo aquifer for industrial uses.	Hydrology, Water Use, and Water Quality
	MM-4	**Project Description:** Concerned that cleanup costs be provided in a bond.	Project Description
	MM-5	**Project Description:** Concerned other technologies will quickly make the Solar Two technology obsolete.	Project Description

Name and Agency of Commenter (and Date of Comment)	Comment Number	Summary of Comments by Environmental Parameter or Topic	Where the Comments will be Addressed in the Environmental Document
Richard A. Ayers (letter dated 12/27/08)	RA-1	**Project Description:** Who is financially responsible for cleanup if the technology is not successful; taxpayer liability?	Project Description
	RA-2	**Project Description/Purpose:** Relationship to the Southwest Powerlink and role of Sempra.	Project Description
	RA-3	**Project Description:** SunCatcher reliability is not proven in actual operations.	Project Description
	RA-4	Stirling engines not successfully adapted for other commercial uses.	See Note 1
	RA-5	**Project Description:** Issues related to metal creep, metal fatigue, and seal integrity.	Project Description
	RA-6	**Project Description:** Need a level of project between small amount of units tested at Sandia and total proposed number of units for the Solar Two project; suggest 1 megawatt (MW)	Project Description
	RA-7	Recommends deferral of the Southwest Powerlink until needed in the future.	See Note 1
Cheryl Lenz (letter dated 1/2/09)	CL-1	**Project Description:** Who is financially responsible for cleanup if the technology is not successful; taxpayer liability?	Project Description
	CL-2	**Project Description:** SunCatcher reliability is not proven in actual operations.	Project Description
	CL-3	**Air Quality:** Effects of sand storms and “white clouds” from Plaster City.	Air Quality
	CL-4	**Project Description:** Need a level of project between small amount of units tested at Sandia and total proposed number of units for the Solar Two project; suggest 1 MW	Project Description
Charlene Ayers (letter dated 1/2/09)	CA-1	**Project Description:** Concerns regarding viability of technology and availability of technical information on the technology.	Project Description
	CA-2	**Project Description:** Potential effects of sand on the facility.	Project Description
	CA-3	**Project Description:** Commercial availability and viability of the technology.	Project Description
Donna Tisdale (letter dated 1/2/09) (see Note 3)	DT-1	Suggests rejecting the SES Solar Two and other projects because they do not represent the best and highest use of land, are not in the best interest of the taxpayers, and will result in loss of the use of public lands and recreation areas.	See Note 1
	DT-2	**Alternatives:** Other technologies are less destructive, expensive, and time consuming for approvals/litigation.	Alternatives
	DT-3	**Other Environmental Document:** Incorporates by reference the Final EIR and other materials for the Sunrise Powerlink project in her comments.	See Note 2

Name and Agency of Commenter (and Date of Comment)	Comment Number	Summary of Comments by Environmental Parameter or Topic	Where the Comments will be Addressed in the Environmental Document
	DT-4	Incorporates by reference the *San Diego Smart Energy 2020* report in her comments.	Refer to comment DT-3 above, which includes a copy of that report.
	DT-5	**Project Funding:** Concerned regarding availability/sources of funding.	Project Description
	DT-6	**Project Description:** SunCatcher reliability is not proven in actual operations.	Project Description
	DT-7	**Project Description:** Construction of SunCatchers on site: where will that facility be, how big will it be, what are the impacts of that facility?	Project Description
	DT-8	**Land Use:** Definition of "limited use" designation.	Land Use
	DT-9	**Cultural Resources:** Potential for additional cultural resources in the area.	Cultural Resources
	DT-10	**Recreation:** Impacts on recreation uses and users.	Land Use
	DT-11	**Visual Resources:** Effects of motion-sensitive lighting.	Visual Resources
	DT-12	**Project Description:** Need data on current wind conditions to understand the effects of wind resulting in downtime.	Project Description
	DT-13	**Project Description:** Does Sunrise Powerlink have sufficient transmission capacity available for the SES Solar Two project? If not, are there other sources of capacity available?	Project Description
	DT-14	**Socioeconomics:** What kind of jobs at what skill levels will be created? Will those jobs be met by existing employees in Imperial County or other American workers or will they require employees from other countries?	Socioeconomics
	DT-15	**Visual:** Potential for glare impacts on motorists on Interstate 8, other streets, and United States Navy, United States Border Patrol, and general aviation activities in the area.	Visual Resources
	DT-16	**Visual:** Potential for project and cumulative visual impacts.	Visual Resources
	DT-17	**Cultural Resources:** Potential for project and cumulative impacts on cultural resources.	Cultural Resources
	DT-18	**Air Quality:** Potential project impacts related to dust, hydrogen gas, and diesel emissions, and cumulative impacts with other area land uses.	Air Quality
	DT-19	**Water Use:** Not clear that IID has committed to provide the water needed for the project.	Hydrology, Water Use, and Water Quality
	DT-20	**Hydrology:** Effects on watercourses and groundwater.	Hydrology, Water Use, and Water Quality

Name and Agency of Commenter (and Date of Comment)	Comment Number	Summary of Comments by Environmental Parameter or Topic	Where the Comments will be Addressed in the Environmental Document
	DT-21	**Floods:** Effects of rare floods on project facilities; project facilities and debris basins located in floodplains.	Hydrology, Water Use, and Water Quality
	DT-22	**Project Description:** Need better description of evaporation ponds and the waste materials generated in those ponds.	Project Description
	DT-24	**Recreation:** Cumulative effects on recreation uses/users and general quiet enjoyment of public lands.	Land Use
	DT-25	**Cumulative Impacts:** Potential effects related to a wide range of environmental parameters.	Cumulative Impacts (in sections by environmental parameter)
	DT-26	**Value of Land:** Appraisal, calculation of value of BLM lands, likely fees that would be paid to BLM.	See Note 1
	DT-27	**Project Description:** Concerned that cleanup costs be provided in a bond.	Project Description
	DT-28	**Alternatives:** Look at different technologies.	Alternatives
Denis Trafecanty (letter dated 1/3/09) (see Note 5)	DET-1	Opposed to both the Sunrise Powerlink project and the Solar Two project.	See Note 1
	DET-2	**Project Description:** SunCatcher reliability is not proven in actual operations.	Project Description
	DET-3	**Project Description:** Costs to produce electricity too high; refer to the *San Diego Smart Energy 2020* report attached to this comment.	Project Description

NOTE 1: This comment does not raise an issue under the National Environmental Policy Act (NEPA) or the California Environmental Quality Act (CEQA). All comments describing support for or opposition to the proposed project or asking for analyses not required under CEQA or NEPA will be considered by the decision-makers at the BLM and the Energy Commission.

NOTE 2: The Final EIR for the Sunrise Powerlink project (A.06-08-010) is on file at the Energy Commission and therefore does not need to be incorporated in the record for this current project. The Energy Commission and the BLM used that document, plus other materials and past experiences on energy projects, plus agency and public input provided during the scoping process, to scope the technical studies and environmental document for the proposed Solar Two project.

NOTE 3: This commenter also provided verbal comments at the November 24, 2008, scoping meeting and/or the December 18, 2008, workshop/scoping meeting. Refer to Table 3.B for a summary of those verbal comments. Comments from these parties are numbered consecutively, including the written comments in Table 3.A and the verbal comments in Table 3.B.

NOTE 4: Ms. Harmon also provided written comments to the Energy Commission, as summarized in Table 3.A, as a representative of the Sierra Club, San Diego Chapter. Ms. Harmon did not indicate that she was commenting on behalf of the Sierra Club in her verbal comments provided at the two scoping meetings. Therefore, her comments at the scoping meeting are numbered as comments from an individual and separately from her comments as a representative of the Sierra Club.

NOTE 5: Mr. Trafecanty also provided written comments to the Energy Commission, as summarized in Table 3.A, as an individual. In those written comments, Mr. Trafecanty did not indicate that he was commenting on behalf of the Protect Our Communities Fund (POCF) as he did in his verbal comments at the November 24, 2008, scoping meeting. Therefore, his verbal comments at the scoping meeting are numbered as comments from Mr. Trafecanty as a representative of POCF and separately from his written comments to the Energy Commission as an individual.

Introduction Table 2
Summary of Verbal Comments Received
at the November 24, 2008, and December 18, 2008, Scoping Meetings

Name and Agency of Commenter (transcript pages)	Comment Number	Summary of Comments by Environmental Parameter or Topic	Where the Comments will be Addressed in the Environmental Document
VERBAL COMMENTS RECEIVED AT THE NOVEMBER 24, 2008, SCOPING MEETING			
Paul Foley, California Unions for Reliable Energy (CURE), Intervener (pg 10)	—	No comment; acknowledged his presence as a representative of CURE as an intervener for the Solar Two project.	—
Gary Wyatt, Supervisor, Imperial County (pp 62–66)	GW-1	Supportive of renewable energy opportunities, and new industry/jobs in Imperial County; supportive of the Solar Two project.	See Note 1
John Mennvielle, President, Imperial Irrigation District (IID) Board of Directors (pp 66 and 67) (see Note 2)	IID-2	Supportive of the SES Solar Two project and its benefits for employment and the regional economy.	See Note 1
Mark Gran, City Council Member, City of Imperial (pp 67 and 68)	MG-1	Supportive of the SES Solar Two project, economic driver for the area, good paying jobs.	See Note 1
Marlene Best, Imperial Valley Economic Development Corporation (pp 68 and 69)	MB-1	Supportive of the SES Solar Two project and the economic and employment benefits.	See Note 1
Connie Bergmark, Resident, Imperial Lakes (pp 69 and 70)	CB-1	**Public Participation:** Supportive of renewable energy, wants to be kept informed about construction and operations as project progresses.	Public Coordination
Jennifer Donavan, Resident, Imperial Lakes (pg 70)	JD-1	Supportive of Solar Two project and employment and economic benefits.	See Note 1
Maurice Lam (pp 71 and 72)	ML-1	Supportive of Solar Two project and employment and economic benefits; area has substantial resources to offer to project.	See Note 1

Name and Agency of Commenter (transcript pages)	Comment Number	Summary of Comments by Environmental Parameter or Topic	Where the Comments will be Addressed in the Environmental Document
Dennis Trafecanty, Protect Our Communities Fund, San Diego Foundation (pp 73–77) (see Note 4)	POCF-1	**Project Description:** Concerned about Stirling Energy Systems, LLC (SES) and the Solar Two project; concerned about the commercial viability of the project.	Project Description
	POCF-2	**Project Description:** Concerned about availability of funding for the project.	Project Description
	POCF-3	**Project Description:** Relationship to the Sunrise Powerlink project; does not think Sunrise Powerlink project is commercial.	Project Description
	POCF-4	**Project Description:** Concerned regarding public investment in Sunrise Powerlink, which is part of the cost of the Solar Two project.	Project Description
	POCF-5	**Purpose and Need:** Questions when power will actually be needed in San Diego.	Purpose and Need
	POCF-6	**Air Quality and Health and Safety:** Health concerns in Imperial Valley, asthma; concerned regarding bringing “dirty” fossil fuels from Mexico to support the San Diego Gas and Electric (SDG&E)/Sempra projects.	Air Quality and Health and Safety
	POCF-7	**Project Description:** Do not want transmission lines through open desert or through Anza Borrego Desert State Park.	Project Description
	POCF-8	Impacts to big horn sheep and sheep migration route to Mexico.	Biological Resources and Areas of Critical Environmental Concern (ACEC)
Laura McDonald, SDG&E (pp 77 and 78)	LM-1	Supportive of the SES Solar Two project.	See Note 1
Carroll Buckley, President of the El Centro Chamber of Commerce and Visitors Bureau (pp 78 and 79) (see Note 2)	ECCC-2	Supportive of SES Solar Two project and employment and economic benefits.	See Note 1
Karen Collins (pp 79–81)	KC-1	**Project Description:** Concerned that energy generated will go to San Diego with none to IID.	Project Description
	KC-2	**Project Description:** Concern regarding life expectancy of dishes and what happens when they are abandoned.	Project Description
	KC-3	**Cultural Resources:** Concerned regarding impacts on cultural resources, National Register of Historic Places resources, Lake Kuwae, District for the Yuha Intaglios, cremation sites.	Cultural Resources

Name and Agency of Commenter (transcript pages)	Comment Number	Summary of Comments by Environmental Parameter or Topic	Where the Comments will be Addressed in the Environmental Document
	KC-4	**Alternatives:** Suggests sites already disturbed by agricultural uses.	Alternatives
	KC-5	**Alternatives:** Site closer to water sources to take advantage of gravity flow and avoid the need for pumps.	Alternatives
	KC-6	**Water Supplies/Use:** Does not think there is sufficient water available for the project.	Hydrology, Water Use, and Water Quality
Tim Kelly, President and Chief Executive Officer of the Imperial Valley Economic Development Corporation (pp 81–84)	TK-1	Appreciates current economic benefits based on presence of SES in Imperial County.	See Note 1
	TK-2	Supportive of the SES Solar Two project, job creation, training for project jobs, dust mitigation/reduction in health impacts, tourism to see the project, generation of energy, lower rates in Imperial County.	See Note 1
Christina Luhn, San Diego Regional Economic Development Corp. (pp 84 and 85)	REDC-1	Supportive of the SES Solar Two project for creation of jobs in industries that have a future.	See Note 1
Steve Taylor, SDG&E (pp 85 and 86)	ST-1	Supportive of the Solar Two project and technology, benefits SDG&E achievement of defined renewable portfolio standard.	See Note 1
Carmen Lucas (pp 86–90)	CL-1	**Cultural Resources:** Commenter is a Native American, concerned regarding survival of culture.	Cultural Resources
	CL-2	Requests that a Native American monitor be included in site surveys.	Cultural Resources
	CL-3	Cumulative impacts of solar and geothermal projects on Bureau of Land Management (BLM) lands.	Cultural Resources
	CL-4	**Cultural Resources:** Wants care taken; area has a lot of pottery deposits that could be sacrificial burial areas.	Cultural Resources
	CL-5	**Cultural Resources:** Concerned regarding impacts outside immediate disturbance areas.	Cultural Resources
Elias Felix (pg 90)	EF-1	Supportive of the Solar Two project, economic development, educational opportunities to learn about energy production alternatives.	See Note 1
Donna Tisdale (pp 90–94) (see Note 2)	DT-29	**Project Description:** Relationship of SES Solar Two project to the Sunrise Powerlink project. What is the need for Sunrise? Is there available capacity in the Southwest Powerlink project?	Project Description
	DT-30	**Project Description and Land Use:** Concern about the BLM land use amendment and its relationship to the updated resource management plan.	Project Description and Land Use

Name and Agency of Commenter (transcript pages)	Comment Number	Summary of Comments by Environmental Parameter or Topic	Where the Comments will be Addressed in the Environmental Document
	DT-31	**Socioeconomics:** Concern that jobs go to local people and not people brought from outside the community.	Socioeconomics
	DT-32	**Project Description:** Will project need tax breaks or incentives?	Project Description
	DT-33	**Project Description:** Why not build the fabrication factory in the project area?	Project Description
	DT-34	**Visual and Aesthetics, and Public Health and Safety:** Concern regarding reflection from mirrors on drivers and aircraft.	Visual and Aesthetics, and Public Health and Safety
	DT-35	**Project Description:** What will the cost of the Solar Two project be to ratepayers?	Project Description
	DT-36	**Cumulative Impacts:** Concerned about cumulative impacts of various renewable energy projects, on 2.5 million acres of BLM lands.	Cumulative Impacts
Edie Harmon (pp 94–99) (see Note 3)	EH-1	**Air Quality:** Questions the effect of dust on the mirrors and other moving parts of the Solar Two project.	Air Quality
	EH-2	**Project Description:** Effects of wind on the project components	Project Description
	EH-3	**Project Description:** Concern regarding the differences between Sandia, New Mexico and the Imperial Valley; prototype was a smaller scale and in a different type of area.	Project Description
	EH-4	Concern regarding impacts on cultural resources.	Cultural Resources
	EH-5	**Project Description:** Why isn't the electricity being generated going to nearby land uses or the IID?	Project Description
	EH-6	**Project Description:** Is this project dependent on the Sunrise Powerlink project?	Project Description
	EH-7	**Alternatives:** Why not alternative sources for San Diego in San Diego: rooftop solar, photovoltaics, distributed electricity?	Alternatives
	EH-8	**Project Description and Alternatives:** Concerned that industry thinks public lands are a less expensive way of getting land than using fallowed farmlands, abandoned feedlots, areas where the soil is sterile, parking lots, rooftops.	Project Description and Alternatives
	EH-9	**Air Quality:** Concerns regarding carbon sequestration on the affected lands.	Air Quality

Name and Agency of Commenter (transcript pages)	Comment Number	Summary of Comments by Environmental Parameter or Topic	Where the Comments will be Addressed in the Environmental Document
Thomas Topuzes, Co-Chair, MegaRegion Initiative (pp 101 and 102)	TT-1	Supportive of the Solar Two project and the jobs it would provide.	See Note 1
Tim Dubose, Second Vice-President, Building Industry Association, Desert Chapter (pp 102–105)	TD-1	Supportive of the Solar Two project and the jobs it would provide.	See Note 1
VERBAL COMMENTS RECEIVED AT THE DECEMBER 18, 2008, SCOPING MEETING			
Paul Foley, CURE, Intervener (pp 9, 10, 23–26, 31–33, 41–43, 70, 71, and 102)	—	No comment; introduced himself as a representative of CURE as an intervener for the Solar Two project.	—
	CURE-1	**Biological Resources:** Questions regarding the jurisdictional delineation provided by the applicant: status, whether it addresses the transmission or water lines off the project site.	Biological Resources
	CURE-2	**Project Description:** Question regarding the value and disposal of scrap metal when the project is decommissioned.	Project Description
	CURE-3	**Water Quality and Project Permits:** Will the project have a general or individual storm water permit during construction? Have the appropriate water quality control agencies been contacted regarding the project?	Water Quality and Project Permits
	CURE-4	**Air Quality:** Questions regarding air quality permit and dust mitigation.	Air Quality
	CURE-5	**Project Description and Land Use:** Questions regarding parcels that are not part of the project or are immediately adjacent to the project site and how access and other considerations regarding those parcels will be addressed.	Project Description and Land Use
	CURE-6	Comment on the size of the project parcel (10 square miles)	See Note 1
	—	No comment; acknowledged his presence as a representative of CURE as an intervener for the Solar Two project (during the second half of the meeting).	—
Edie Harmon (pp 71–88, 122, 123, 140–148, and 156–158)	EH-10	**Water Use/Supply:** Questioned the amount of water that would be stored on site and the issue of evaporation.	Water Use
	EH-11	Question regarding effects of high total dissolved solids (TDS) in area groundwater.	Water Quality
	EH-12	**Project Description and Water Use:** Question regarding which aquifer water will come from.	Project Description and Water Use

Name and Agency of Commenter (transcript pages)	Comment Number	Summary of Comments by Environmental Parameter or Topic	Where the Comments will be Addressed in the Environmental Document
	EH-13	**Biological Resources:** Comment that wastewater ponds should not be attractive to wildlife.	Biological Resources
	EH-14	**Project Description and Water Use:** Question regarding how much water will be used by project.	Project Description and Water Use
	EH-15	**Project Description and Air Quality:** Question on whether project roads will be paved; issue of dust generation.	Project Description and Air Quality
	EH-16	**Project Description:** Question regarding frequency of mirror washing.	Project Description
	EH-17	**Cultural Resources:** Concern regarding cultural resources, archaeological sites, historic trails in the area.	Cultural Resources
	EH-18	**Cultural Resources:** Concern that cultural studies are conducted by persons familiar with the desert and desert cultures.	Cultural Resources
	EH-19	**Cultural Resources:** Concern that Native American issues be handled appropriately and sensitively.	Cultural Resources
	EH-20	**Air Quality and Public Health and Safety:** Questions regarding airborne soil fungi and potential effects on prisoners at the State Prison and as a general public health issue.	Air Quality and Public Health and Safety
	EH-21	Wants the real estate appraisals to be public.	See Note 1
	EH-22	**Alternatives:** Look at alternative sites including Mesquite Lake, which is zoned for industrial uses.	Alternatives
	EH-23	**Alternatives:** Look at an alternative site that is already disturbed, such as for agriculture or feedlots.	Alternatives
	EH-24	**Cumulative Impacts:** Look at cumulative impacts of all solar projects on BLM lands.	Cumulative Impacts
	EH-25	**Alternatives:** Look at in-base and solar rooftop alternatives.	Alternatives
	EH-26	**Air Quality and Socioeconomics:** Address climate change and potential effects on demographics in San Diego.	Air Quality and Socioeconomics
	EH-27	**Project Description and Alternatives:** Disperse units to provide electricity to the prison, schools, hospitals, etc; or to IID; or to meet high daytime demand in the county.	Project Description and Alternatives
	EH-28	**Project Description:** Concerned that use of public land is solely to ensure profitability of the project.	Project Description

Name and Agency of Commenter (transcript pages)	Comment Number	Summary of Comments by Environmental Parameter or Topic	Where the Comments will be Addressed in the Environmental Document
	EH-29	**Visual and Aesthetics:** Assess visual resources impacts consistent with the BLM Visual Resources Management guidelines.	Visual and Aesthetics
	EH-30	**Project Description and Land Use:** Concern on how the plan amendment will be done.	Project Description and Land Use
	EH-31	**Project Description:** Will sources of funding include federal funding for a private profit-making company?	Project Description
	EH-32	**Project Description:** Comments from Dr. Butler on the downtime for the dishes.	Project Description
	EH-33	**Project Description:** Concerns regarding the reliability of the process and the ability to provide the number of solar dishes proposed for this and other projects.	Project Description
	EH-34	**Project Description:** Concerns about where the engines will be on the site.	Project Description
	EH-35	**Project Description and Biological Resources:** Concerns about the evaporation of water from the wastewater ponds; does not want the ponds to be attractive to birds.	Project Description and Biological Resources
	EH-36	**Biological Resources:** Concern regarding invasive plant species.	Biological Resources
	EH-37	**Cultural Resources:** Wants BLM to work closely with Native Americans.	Cultural Resources
Donna Tisdale (pp 88, 89, and 48–152) (see Note 2)	DT-37	Concerned that the Energy Commission/BLM should not depend on the Environmental Impact Report (EIR) for U.S. Gypsum because the commenter feels it was inadequate.	See Note 1
	DT-38	Concerned that government employees are subject to substantial political pressure.	See Note 1
	DT-39	Commented on approval of the Sunrise Powerlink project through the community of Boulevard.	See Note 1
	DT-40	**Project Description:** Concerned with winds on the site; will an anemometer be used?	Project Description
	DT-41	**Cumulative Impacts:** Wants cumulative visual impacts addressed, including several projects in the vicinity of the Solar Two project.	Cumulative Impacts
	DT-42	**Project Description:** Concerned that project is in early phases without details on funding and manufacturing of the project components.	Project Description

Name and Agency of Commenter (transcript pages)	Comment Number	Summary of Comments by Environmental Parameter or Topic	Where the Comments will be Addressed in the Environmental Document
	DT-43	**Project Description:** Concern about whether there is sufficient capacity in the Sunrise Powerlink project for the Solar Two project and other projects in line or proposed.	Project Description
Teri Weiner, Desert Protective Council (DPC) (pp 89–94, 123, and 137–139) (see Note 2)	DPC-1	**Project Description:** Questions regarding how the Solar Two energy generation process works.	Project Description
	DPC-2	**Biological Resources:** Concerned regarding effects on the burrowing owl.	Biological Resources
	DPC-3	**Biological Resource:** Concerned regarding effects on the flat-tailed horned lizard.	Biological Resources
	DPC-4	**Biological Resources and Project Permits:** Question regarding need for a Streambed Alteration Agreement from the California Department of Fish and Game.	Biological Resources and Project Permits
	DPC-5	**Project Description:** When would construction start? After the environmental process?	Project Description
	DPC-6	**Project Description and Land Use:** Question on when the draft land use amendment would be released.	Project Description and Land Use
	DPC-7	Requests an economic analysis comparing the Solar Two project with other renewable energy projects such as rooftop solar.	See Note 1
	DPC-8	**Alternatives:** Concern regarding use of public lands for so many projects, including renewable energy such as the Solar Two project, when there are alternative areas where those projects could be located.	Alternatives
	DPC-9	**Visual and Aesthetics:** Importance of visual resources in the desert.	Visual and Aesthetics
	DPC-10	**Socioeconomics:** What are the economic impacts of the project?	Socioeconomics
	DPC-11	**Public Health and Safety:** Concern regarding glare from mirrors to aircraft.	Public Health and Safety
	DPC-12	**Cultural Resources:** Engage Native American leaders to provide input on the cultural integrity of the area.	Cultural Resources
	DPC-13	**Water Use:** Concern regarding the demand for water to wash the mirrors.	Water Use
Marilyn Moskowitz (pp 152–154) (see Note 2)	MM-6	**Air Quality and Public Health and Safety:** Concerned regarding air quality in the area and health effects such as asthma.	Air Quality and Public Health and Safety
	MM-7	**Water Sources and Use:** Concerned regarding using drinking quality water from the aquifer.	Water Use
	MM-8	**Alternatives:** An alternative to Solar Two would be rooftop solar.	Alternatives

Name and Agency of Commenter (transcript pages)	Comment Number	Summary of Comments by Environmental Parameter or Topic	Where the Comments will be Addressed in the Environmental Document
	MM-9	**Project Description:** Concerned about technological obsolescence of the project and who will be financially responsible at that point. Wants a large bond posted for cleanup and restoration of the site.	Project Description
	MM-10	**Alternatives:** Shift from large mega stations to decentralized, localized, and alternative sources.	Alternatives
Steve Taylor, SDG&E (pp 155 and 156)	ST-2	Supportive of the Solar Two project	See Note 1

NOTE 1: This comment does not raise an issue under the National Environmental Policy Act (NEPA) or the California Environmental Quality Act (CEQA) relative to the proposed Solar Two project. All comments describing support for or opposition to the proposed project or asking for analyses not required under CEQA and NEPA will be considered by the decision-makers at the United States Department of the Interior, Bureau of Land Management and the Energy Commission.

NOTE 2: This commenter also provided written comments to the Energy Commission. Refer to Table 3.A for a summary of those comments. Comments from these parties are numbered consecutively, including the written comments in Table 3.A and the verbal comments in Table 3.B.

NOTE 3: Ms. Harmon also provided written comments to the Energy Commission, as summarized in Table 3.A, as a representative of the Sierra Club, San Diego Chapter. Ms. Harmon did not indicate that she was commenting on behalf of the Sierra Club in her verbal comments provided at the two scoping meetings. Therefore, her comments at the scoping meeting are numbered as comments from an individual and separately from her comments as a representative of the Sierra Club.

NOTE 4: Mr. Trafecanty also provided written comments to the Energy Commission, as summarized in Table 3.A, as an individual. In those written comments, Mr. Trafecanty did not indicate that he was commenting on behalf of the Protect Our Communities Fund (POCF) as he did in his verbal comments at the November 24, 2008, scoping meeting. Therefore, his verbal comments at the scoping meeting are numbered as comments from Mr. Trafecanty as a representative of POCF and separately from his written comments to the Energy Commission as an individual.

A.8 ORGANIZATION OF THE DOCUMENT

The SA/DEIS begins with an Executive Summary, Introduction, Proposed Action Alternative/Project Description, Alternatives, and Cumulative Scenario. The environmental, engineering, and public health and safety analyses of the proposed project are contained in 20 separate chapters. They include the following: Air Quality, Biological Resources, Cultural Resources and Native American Values, Hazardous Materials Management, Land Use Recreation and Wilderness, Noise and Vibration, Public Health and Safety, Socioeconomics and Environmental Justice, Soil and Water Resources, Traffic and Transportation, Transmission Line Safety and Nuisance, Visual Resources, Waste Management, Worker Safety and Fire Protection, Geology Soils and Paleontological and Mineral Resources, Geologic Stability, Facility Design, Power Plant Efficiency, Power Plant Reliability, and Transmission System Engineering. These chapters are followed by the general project conditions and a summary of agency and public comments. This is followed by a list of staff who contributed to the document and a reference list.

Each of the 20 technical area assessments includes a discussion of:

- laws, ordinances, regulations and standards (LORS);
- the regional and site-specific setting;
- project direct and indirect impacts;
- mitigation measures;
- closure and decommissioning impacts and mitigation;
- no project/no action alternative;
- cumulative impacts;
- noteworthy public benefits;
- response to public and agency comments on the PSA;
- conclusions and recommendations; and
- mitigation measures/conditions of certification for both construction and operation (as applicable).

B.1 - PROPOSED PROJECT

Christopher Meyer and Jim Stobaugh

B.1.1 INTRODUCTION

On June 30, 2008, Stirling Engine Systems Solar Two, LLC, (SES Solar Two, LLC) submitted an Application for Certification (AFC) to the California Energy Commission to develop the Stirling Engine Systems Solar Two Project (SES Solar Two Project) on both privately owned land and public land managed by the Bureau of Land Management (BLM) in Imperial County, California. On October 1, 2008, the Energy Commission accepted the AFC as complete. The applicant's development plans have been updated several times since filing its original right-of-way (ROW) and/or AFC applications with the most substantial revisions summarized as follows in **Project Description Table 1**.

Project Description Table 1
Summary of Applicant's Updates to the SES Solar Two Development Plans

Date	Reference Document	Revisions to Proposed Project
06/08/2008	AFC Section 1.4, page 1-3 (SES2008a)	The project site boundary was reduced from approx. 7,700 acres to 6,500 acres and the electrical output was reduced from 900 MW to 750 MW to avoid potentially significant impacts to cultural resources.
12/08/2008	Data Response #39 (SES2008f)	The main entrance was relocated to the east on Evan Hewes Highway to improve visibility for oncoming traffic and move the guard shack onto the project site.
03/26/2009	Data Response #53-110 (SES2008i)	The on-site road system was reduced to eliminate a majority of the east-west roads and minimize roads in washes.
06/12/2009	Supplement to the AFC, Section 1.2 (SES2009q)	The water supply for the project was changed from the potable water in the Westside Canal to reclaimed water from the Seeley Waste Water Treatment Facility, also requiring an extension of the proposed water pipeline.
06/12/2009	Supplement to the AFC, Section 1.3 (SES2009q)	The hydrogen supply for the project was changed from off-site reformation of natural gas to on-site production from electrolysis (from water). Environmental impacts related to hydrogen tank deliveries avoided.
11/23/2009	Additional Supportive Materials – Biology and Water	Following the completion of the 35% engineering design, SES Solar Two, LLC determined that SunCatchers would be located in washes.

B.1.2 PROJECT LOCATION

The SES Solar Two Project site is located primarily on public land managed by the BLM. The project site is approximately 100 miles east of San Diego, 14 miles west of El Centro, and 4 miles east of Ocotillo. The following sections or portions of sections in Township

16 of the San Bernardino Meridian identify the project site and the planned boundary for development of the SES Solar Two Project (see **Project Description Figure 1**).

Within Township 16 South, Range 11 East of the San Bernardino Meridian defined by:

- the portion of Section 7 south of the railroad ROW,
- the portion of the southwest quarter section and the north half of the southeast quarter section of Section 9 south of the railroad ROW,
- the southeast quarter-quarter section of the northeast quarter section and the east half of the southeast quarter section of Section 14 north of the I-8 ROW and east of Dunaway Road,
- the southwest, northwest, and southeast quarter-quarter sections of the southwest quarter section of Section 15, and the southwest quarter-quarter of the southeast quarter section of Section 15,
- the northwest quarter and southeast quarter of Section 16,
- all of Section 17,
- Section 18, excluding the southwest and southeast quarter-quarter sections of the northeast quarter section,
- the northwest quarter and the portion of the west half of the southwest quarter of Section 19 north of the I-8 ROW,
- the portion of Sections 20 and 21 north of the I-8 ROW, and
- the portion of the north half of the northwest quarter section and the northwest quarter-quarter section of the northeast quarter section of Section 22 north of the I-8 ROW.

Township 16 South, Range 10 East defined by:

- the portions of Sections 12, 13, and 14 south of the railroad ROW,
- the portions of Section 22 south of the railroad ROW,
- all of Sections 23 and 24, and
- the portions of Sections 25, 26, and 27 north of the I-8 ROW.

The proposed SES Solar Two Project also includes an electrical transmission line, water supply pipeline, and a site access road. The off-site 6-inch-diameter water supply pipeline would be constructed a distance of approximately 11.8 miles from the Seeley Waste Water Treatment Facility (SWWTF) to the project boundary. The water supply pipeline would be routed in the Evan Hewes Highway ROW, or adjacent to this ROW on public and private lands. Approximately 7.56 miles of the 10.3-mile double-circuit generation interconnection transmission line would be constructed off-site. The transmission line would connect the proposed SES Solar Two substation to the existing San Diego Gas & Electric (SDG&E) Imperial Valley Substation. A site access road would be constructed from Evan Hewes Highway to the northern boundary of the project site (see **Project Description Figure 2**).

B.1.3 PROCESS DESCRIPTION

The SunCatcher is a 25-kilowatt-electrical (kWe) 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 a 40-foot-high by 38-foot-wide 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 (see **Project Description Figure 3**)..

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 Solar Stirling Engine utilizing an internal working fluid of hydrogen gas that is recycled through the engine. The Solar 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, and this gas in turn powers the Solar Stirling Engine.

A generator is connected to the Solar Stirling Engine; this generator produces the electrical output of the SunCatcher. Each generator is capable of producing 25 kWe 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 glycol-water coolant.

B.1.3.1 SUNCATCHER COMPONENTS

The following section provides an overview of the three major SunCatcher components: the foundation/pedestal, the dish assembly, and the PCU.

Foundation/Pedestal

The solar dish would typically be mounted on a foundation consisting of a metal pipe that is hydraulically driven into the ground. This foundation is preferred because no concrete is required, no spoils are generated, and the foundations can be completely removed when the project is decommissioned. When conditions are not conducive to the use of the metal pipe foundation, the foundation would consist of rebar-reinforced concrete constructed below grade. Both of these foundation designs meet all applicable structural design requirements and applicable LORS.

The SunCatcher pedestal on which the SunCatcher Dish Assembly is secured is approximately 18 feet 6 inches in height and would be an integrated part of the metal pipe foundation or would be a separate structure fastened to the rebar-reinforced concrete foundation at ground level.

Dish Assembly

The SunCatcher Dish Assembly is fitted with a trunnion that attaches to the pedestal. Each Dish Assembly consists of a 38-foot by 40-foot steel structure that supports an array of curved glass mirror facets. These mirrors form a curved shape engineered to concentrate solar energy onto the solar receiver portion of the PCU. The Dish Assembly includes azimuth and elevation drives for tracking the sun and a PCU support boom.

The SunCatcher Dish Positioning Control System employs proprietary algorithms to track the sun. This system focuses the solar energy onto the solar receiver by controlling elevation and azimuth drives, and executes startup, shutdown, and de-track procedures. These procedures allow the dish to “wake up” from the night-stow position in the morning to focus the dish mirror facets on the solar receiver of the PCU, and then to track the sun during the daylight operating time of the project. The dish control system also communicates with and receives instructions from the central control room via the Supervisory Control and Data Acquisition (SCADA) system. The system is designed to place the dish into a “wind stow” position when sustained winds exceed 35 miles per hour to protect the system from wind damage. The system also places the dish into “wind stow” position on loss of communications with the central control room or on receipt of a fault signal from the PCU control system.

Power Conversion Unit

The SunCatcher PCU converts the solar energy into grid-quality electricity. Hydrogen gas is used in a closed-cycle heating/expansion – cooling/compression cycle to drive a high-efficiency, 380-cubic-centimeter displacement, 4-cylinder reciprocating Solar Stirling Engine. The Solar Stirling Engine powers an electrical generator that produces 25 kWe net output after accounting for on-board parasitic loads at 575-volt alternating current, 60 Hz of grid-quality electricity. The PCU attaches to the end of the PCU boom.

The dimensions of the PCU are approximately 88 inches (7 feet) long by 63 inches (5 feet) wide by 37 inches (3 feet) high. The PCU weighs approximately 1,400 pounds.

The PCU consists of six subsystems: solar receiver, Solar Stirling Engine, generator; cooling system, gas management system, and the PCU control system. Each subsystem is described below.

- **Solar Receiver:** The SunCatcher solar receiver consists of an insulated cavity with an aperture that allows the solar energy to enter. Within the cavity are 4 heater heads. Each heater head forms a tube network for one quadrant of the engine. The solar flux, radio energy from the sun, heats the metal tubes and the heat is then transferred through the tubes to the working hydrogen gas. The heat absorbed at the solar receiver drives the Solar Stirling Engine.
- **Solar Stirling Engine:** The kinematic Solar Stirling Engine has evolved from a Kockums kinematic Solar Stirling Engine design. Kockums, the world’s leader in kinematic Solar Stirling Engines, has invested significant development into the design, efficiency, and reliability of this type of Solar Stirling Engine since purchasing the technology in 1970. The Kockums kinematic Solar Stirling Engine is used as a propulsion source for submarines and is highly reliable, low maintenance, and highly

efficient. Solar Two has further developed and improved the engine design specifically for use in the SunCatcher.

- **Generator:** A generator is connected to the Solar Stirling Engine to produce the electrical output of the SunCatcher. The PCU generator attached to each Solar Stirling Engine is capable of producing up to 25 kWe at 575 VAC, 60 Hz of grid-quality electricity when operating with a solar input of between 250 and 1,000 W/m^2. The generator output is connected to the power collection system.
- **Cooling System:** Waste heat from the hydrogen gas within the engine is transferred to the ambient air via a radiator system similar to the type used in automobiles. The SunCatcher cooling system is made up of ethylene-glycol fluid, a cooler in the gas circuit, a radiator, a fluid circulation pump, and a cooling fan. The cooling fan and circulation pump are driven by electric motors.

  The system is used to cool the hydrogen gas before the compression portion of the cycle. The pump circulates the cooling fluid through the gas cooler and radiator. Waste heat from the hydrogen gas is transferred to the ethylene-glycol fluid in the cooler. The coolant is then pumped through the radiator where the fan forces ambient air over the cooling fins to remove heat. The heat is transferred to the atmosphere via the airflow over the radiator.
- **Gas Management System:** The gas management system controls the working pressure to ensure high efficiencies. The hydrogen gas is contained within a closed and sealed cycle, yet a very small amount of the hydrogen working fluid does leak (less than 200 cubic feet per dish per year) by the rod seals and is lost to the atmosphere. As a result, an on-site distributed hydrogen system has been proposed to replenish hydrogen lost to the atmosphere.
- **Control System:** The SunCatcher PCU control system monitors, controls, and communicates PCU performance. Thermal detectors are monitored by the PCU control system and the data are used to control the thermal balancing of the PCU. Alarms and faults monitored by the PCU control system are communicated to the Dish Positioning Control System and the Project SCADA system.

B.1.4 PROJECT DESCRIPTION

The proposed SES Solar Two Project would be a nominal 750-megawatt (MW) Solar Stirling Engine project, with construction originally planned to begin in either late 2009 or early 2010. Although construction would take approximately 40 months to complete, power would be available to the grid as each 60-unit group of Stirling Engine modules is completed. The primary equipment for the generating facility would include approximately 30,000, 25-kilowatt solar dish Stirling systems (referred to as SunCatchers), their associated equipment and systems, and their support infrastructure. Each SunCatcher 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 then driving an electrical generator to produce electricity. The 6,500-acre project site is located on approximately 6,140 acres of public land managed by the BLM and approximately 360 acres of privately owned land.

The applicant has applied for a right-of-way (ROW) grant for the project site from the BLM California Desert District. Although the project is phased, it is being analyzed in this SA/DEIS as if all phases would be operational at the same time.

Within the project boundary, the SunCatchers in Phase I require approximately 2,600 acres and those in Phase II require approximately 3,500 acres. The total area required for both phases, including the area for the operation and administration building, the maintenance building, and the substation building, is approximately 6,500 acres. The 230-kV transmission line required for Phase I would parallel SDG&E's existing Southwest Powerlink transmission line within the designated ROW. A water supply pipeline for the project would be built on the existing Evan Hewes Highway ROW.

B.1.4.1 PROJECT SITE ARRANGEMENT

The basic building blocks for the project are 1.5-MW solar groups consisting of 60 SunCatchers. The 1.5-MW groups would be connected in series to create 3-, 6-, and 9-MW solar groups. The 3-, 6-, and 9-MW groups would be connected to overhead collection lines rated at 48 MW or 51 MW. The typical solar groups would be arranged as necessary to fit the contours of the site.

The entire project would be fenced for security, however the design of the fencing is being determined in coordination with the regulatory and resource agency to protect sensitive ecological areas and address storm flows in washes. The project would have 2 laydown areas. One laydown area would be located on approximately 110 acres east of Dunaway Road and north of I-8. The other laydown area would be located on-site on approximately 11 acres adjacent to the Main Services Complex.

The fenced boundary of the project would encompass approximately 6,500 acres of land, not including the private parcels of land designated as not a part of the project. Access to the federal land managed by the BLM would be authorized under a ROW permit.

During project construction and operation, the main access to the project site would be from the north, off the Evan Hewes Highway. Secondary access would be from the east via Dunaway Road and I-8. The AFC proposed the development of the following roadways on the project site: approximately 27 miles of paved arterial roads, approximately 14 miles of unpaved perimeter roads, and approximately 234 miles of unpaved access routes. However, the applicant has committed to eliminating a number of the east-west roads on the project site. The paved arterial roads would reduce fugitive dust while allowing full access to all dishes and infrastructure. Polymeric stabilizers may 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.

B.1.4.2 SOLAR POWER PLANT EQUIPMENT AND FACILITIES

Project Description Table 2, Major Equipment List, and Project Description Table 3, Significant Structures and Equipment, list the major equipment and significant structures required for the SES Solar Two Project, respectively.

Project Description Table 2
Major Equipment List

Description	Quantity	Size/Capacity	Remarks
SunCatcher power generating system	30,000	25 kWe	Focuses solar energy onto a Power Conversion Unit to generate 25 kWe of electricity
Generator collection sub-panel; distribution panel, 42 circuit, with circuit breakers in a weatherproof enclosure	2,500	400 A, 600 V	Collects the output from 12 Stirling dish assemblies (one 300-MW solar group). Each dish assembly connects to a 40-A, 3-pole circuit breaker (36 poles).
Generator collection power center, distribution switchboard with 6 400-A circuit breakers	500	2,000 A Bus, 600 V	Collects 5 1.5-MW solar groups and connects one power factor correction capacitor group.
Collector group generator step-up unit (GSU) transformer, with taps	500	1,750 kVA, 575 V to 34.5 kV	Step up power from 1.5-MW solar group (60 Stirling dishes assemblies).
Power factor correction capacitor, switched in 5 each 200 kVAR steps	500	1,000 kVAR, 600 V	Provides power factor correction at the 1.5-MW solar group level.
Open bus switch rack, 5 1,200-A feeder breakers, 40-kA INT, with switches, insulators, and bus work	5	34.5 kV, 3,000A	Each switch rack lineup collects 150 MW at 34.5 kV.
Shunt capacitor bank, switched in 6 15-MVAR steps	5	34.5 kV, 90 MVAR	Provides power factor correction at the 150-MW solar group level.
Dynamic VAR (DVAR) compensation system in coordination with shunt capacitor banks; size to be determined by studies	1	34.5 kV, size to be determined	Provides active VAR compensation to maintain required power factor profile and to aid in meeting low-voltage ride-through requirements.
Disconnect switch, 35 kV, 200 kVBIL, group-operated	10	35 kV, 3,000 A	Provides capability to isolate power transformer from the 34.5-kV collection system.
Power transformer, 3-phase, oil filled	5	120/160/200 MVA, 230/132.8 to 134.5/19.9 kV, 750 kV BIL	Step up power from 34.5-kV collection voltage to 230-kV transmission voltage.
Power circuit breaker	7	242 kV, 2,000 A, 40-kA interrupting capacity	Transformer and line protection.

Description	Quantity	Size/Capacity	Remarks
Coupling capacitor voltage transformer	6	242 kV, 900 kV BIL, 60 Hz, PT Ratio 1,200/2,000:1	Voltage source for protection and control.
Disconnect switch, 242 kV, 900 kV BIL, group operated	10	242 kV, 2,000 A	For isolation of the power transformers, breakers and for isolating the substation from the interconnect transmission lines.
Diesel power generator set	1	250 kW, 480 V	Installed at Main Services Complex
Fire water pump, diesel	1	26 HP	Installed at Main Services Complex
Water Treatment	1	64,000 gpd	Automatic reverse osmosis system

Source: SES Solar Two AFC (SES 2008a).
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

Project Description Table 3
Significant Structures and Equipment

Description	Quantity	Length (feet)	Width (feet)	Height (feet)
SunCatcher power generating system	30,000	38	38	40
Main Services Complex administration building	1	200	150	14
Main Services Complex maintenance building	1	180	250	44
Main SunCatcher assembly building	3	211	170	78
Raw water storage tank, 175,000 gallons	1	40		20
Demineralized water tank, 175,000 gallons	2	40		20
Potable Water Tank, 17,000 gallons	1	18		10
230-kV transmission line towers, double-circuit with upswept arms	85 to 100	--	32	90 to 110

Description	Quantity	Length (feet)	Width (feet)	Height (feet)
Generator collection sub-panel; distribution panel, 42 circuit, 400 A, 600 V, with circuit breakers in a weatherproof enclosure	2,500	1	2.67	5
Generator collection power center, 2,000-A distribution panels with 6 400-A circuit breakers	500	2	3.33	7.5
Collector group generator step-up unit transformer (GSU), 1,750 kVA, 575 V to 34.5 kV, with taps	500	6.67	7.5	6.67
Power factor correction capacitor, 600 V, 1,000 kVAR, switched in 5, each 200 kVAR steps	500	2.5	6.67	7.5
Open bus switch rack, 35 kV, 7 bay with 5 35-kV, 1,200-A, 40-kVA INT, circuit breakers, insulators, switches, and bus work	5	105	20	30
Shunt capacitor bank, 34.5 kV, 90 MVAR switched in 6 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	4	60	12	16
Disconnect switch, 35 kV, 3,000 A, 200 kV BIL, group-operated	5	3	11	16*
Power transformer, 3-phase, 100/133/166.7 megavolt amp, 230/132.8-34.5/19.9 kV, 750 kV BIL, oil filled	5	15	35	23
Power circuit breaker, 242 kV, 2000A, 40 kilo amp interrupting capacity	7	12	20	16
Coupling capacitor transformer for metering, 242 kV, 900 kV BIL, 60 Hertz, Potential Transformer ratio 1,200/2,000:1	6	1	1	25*
Disconnect switch, 242 kV, 2000A	10	10	25	25*

Source: SES Solar Two, LLC, 2008.
Notes:
*Includes structure height to provide electrical safety clearances to ground.
-- = not applicable
A = ampere (amp)
BIL = basic impulse level
INT = international
kV = kilovolt
kVA = kilovolt amp
kVAR = kilovolt amp reactive
MVAR = megavolt amp reactive
v = volts

B.1.4.3 SITE GRADING AND DRAINAGE

The original layout for the SES Solar Two Project site was based on avoiding major washes and minimizing surface-disturbing activities. Following the completion of the 35% engineering in June of 2009, the applicant determined that it would be necessary to place some SunCatcher units in washes to attain the proposed 750 MW yield.

Brush trimming would be conducted between alternating rows and would consists 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 paved arterial roadways.

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. 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.

The layout of the proposed SES Solar Two Project would maintain the local pre-development drainage patterns where feasible, and water discharge from the site would remain at the eastern boundary. The paved roadways would have a low-flow, unpaved swale or roadway dip as needed to convey nuisance runoff to existing drainage channels/ swales. 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 unpaved roads would utilize low-flow culverts.

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.

Arizona Crossings (roadway dips) would be placed along the roadways or low-flow culverts consisting of a small-diameter storm drain with a perforated stem pipe, 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 (roadway dips) would 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. If asphalt is selected as a paving material, roadway protection would be provided by a concrete cut-off wall along the edges of the roadway with un-grouted (loose) riprap upstream and downstream of the concrete cut-off wall. Alternatively, if polymeric stabilizers are selected, no protection measures would be used or protection may be limited to un-grouted (loose) riprap at critical areas.

The proposed east-west on-site paved arterial roadway section between the Main Services Complex and Dunaway Road would be designed as a designated evacuation route. As such, the culverts for this roadway would be designed such that the roadway section shall have its driving surface constructed above the projected profile of a 25-year event.

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.

Building sites would be developed per county drainage criteria, with provision for soft bottom storm water retention basins. 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.

The retention basin 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.

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, the majority of the project site would remain 100 percent pervious, as 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.

B.1.4.4 BUILDINGS

All buildings would be constructed in accordance with the appropriate edition of the California Building Code (CBC) and other applicable LORS.

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 200 feet long by 150 feet wide by 14 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 180 feet wide by 250 feet long by 44 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 (see **Project Description Figure 4**).

A water treatment shade structure would be located next to the Main Services Complex and to the northeast side of the Main Services Complex. The water treatment structure would house water treatment equipment and safe storage areas for water treatment chemicals. A motor control center for the water treatment equipment and pumps would be located within this structure. Two wastewater evaporative ponds designed for water treatment wastewater containment would be located just north of the water treatment structure.

A control building would be located near the project substation. This building would 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 would be located adjacent to the operation and administration building on the north side.

Electric service for the Main Services Complex would be obtained from Imperial Irrigation District (IID). Electric power would be provided via overhead service from an IID overhead distribution line located on the north side of Evan Hewes Highway.

Communications service for the Main Services Complex would be obtained from L3 Communications Holdings, Inc. Communications service would be provided via an overhead service from existing underground communications lines located on the north side of the railroad located south of Evan Hewes Highway.

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 three assembly buildings would be located beside the Main Services Complex.

Each assembly building would be 170 feet wide by 211 feet long by 78 feet in height and would contain two assembly lines. Each assembly building would be located on a concrete pad for the storage of SunCatcher components and assembled SunCatcher staging before field installation.

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.

A concrete pad with the dimensions 50 feet by 510 feet would be located north of the assembly buildings for staging the assembled SunCatchers before field installation.

Transport trailer storage would be located south of the assembly bays. This storage facility would accommodate approximately 75 to 100 trailers, maintaining a supply of 3 to 5 days of inventory of SunCatchers parts during the assembly phase of construction.

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

B.1.4.5 WATER SUPPLY AND TREATMENT

The following types of water will be required for the project:

- equipment washing water,
- potable water,
- dust control water, and
- fire protection water.

When completed, the SES Solar Two Project would require a total of approximately 32.7 acre-feet of raw water per year. The applicant is working to reduce this consumption by developing alternative mirror washing methods and schedules; however, this SA/DEIS has analyzed the originally proposed 32.7 acre-feet. SunCatcher mirror washing and operations dust control under regular maintenance routines will require an average of approximately 23.3 gallons of raw water per minute, with a daily maximum requirement of approximately 39.2 gallons of raw water per minute during the summer peak months each year, when each SunCatcher receives a single mechanical wash.

Potable water to meet plant requirements would be delivered by truck and stored in a 5000 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.

The SES Solar Two Project water supply requirements are tabulated in Project Description Table 4, Water Usage Rates for Solar Two Project Operations. The table provides both the expected maximum water usage rates and the annual average usage rates.

Project Description Table 4
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	10.4[1]	17.4[2]	14.2[3]
Water Treatment System Discharge			
Brine to evaporation ponds	5.5	10.2[4]	7.5
Potable Water Use			
For drinking and sanitary water requirements	3.9[5]	4.7[6]	5.4[7]
Dust Control			
Raw water for dust control during operations	3.5[8]	6.9[9]	5.6[10]
Totals	**23.3**	**39.2**	**32.7**

Source: SES Solar Two, LLC, 2008.
Notes:
1 - Based on 30,000 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 3 times the normal wash of 14 gallons per SunCatcher. Therefore, the Daily Maximum usage rate is based on two-thirds 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 percent of system discharge.
5 - Assumes 30 gallons per person per day for 188 people.
6 - Maximum amount assumes a 20 percent contingency over the Daily Average.
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.

Water Supply Source

The following water service providers were originally considered by the applicant for the SES Solar Two Project:

- Imperial Irrigation District (IID),
- Ocotillo Mutual Water Company, and
- Coyote Valley Mutual Water Company.

Water studies showed that the aquifer is significantly overdrafted and that new well permits are not being granted. The use of potable water for operational uses was a topic of concern during the Informational Hearing/Scoping Meeting of the proposed project. Therefore, in July of 2009, the applicant expanded the range of possible water sources analyzed and proposed the use of secondary treated water from the Seeley Waste Water Treatment Facility as the new source of water for the project. This change in the proposed water source would extend the water supply pipeline needed to approximately 11.8 miles long. The applicant has proposed moving the alignment of the extended water pipeline from the railroad ROW to the shoulder of the Evan Hewes Highway. This

pipeline would be buried within the ROW of Evan Hewes Highway approximately 30" below the existing grade. The line would enter the SES property approximately 1000 yards east of Plaster City and then run due south to the Raw Water Storage Tank.

The Seeley Waste Water Treatment Facility is located at 1898 West Main Street in Seeley, California, approximately 13 miles east of the project site. It is operated by the Seeley County Water District (SCWD) and is designed to produce secondary treated water at the rate of 200,000 gallons per day (gpd) (139 gpm or 224 acre feet per year [afy]).

According to the current National Pollutant Discharge Elimination System (NPDES) Permit: The treatment system consists of a lift station, a drum screen, a bar screen, a "Clemson" aerated pond treatment system with surface aerators, pressure sand filters, and an ultraviolet (UV) disinfection system. The facility's "Clemson" system consists of 5 aerated ponds operated in series. Bio-solids are removed by draining the last 2 ponds, removing the sludge and storing it in the out of service treatment ponds of the replaced treatment system, prior to removal. Wastewater is discharged from Discharge Point 001 to the New River, a water of the United States, tributary to the Salton Sea, and within the Salton Sea Transboundary Watershed.

The applicant would finance an upgrade to the existing facility to allow it to meet Title 22 water quality standards and would fund the training of operators for the new facility. The SCWD would provide as much treated effluent water as needed to the proposed SES Solar Two Project. The current influent flow rate is approximately 150,000 gpd, or 168 afy. Improvements to the treatment facility would increase the Title 22 effluent capacity to 250,000 gpd. Any surplus water, not needed by the proposed SES Solar Two Project, will be used by SCWD for irrigation or discharged into the New River. The discharge rate is based on the population of the service area, not the annual rain fall.

The water from Seeley Waste Water Treatment Facility is characterized as secondary treated water and will require treatment to remove dissolved solids for SunCatcher mirror wash water applications.

B.1.4.5 WASTEWATER AND WASTE MANAGEMENT

The water treatment wastewater generated by the RO unit would contain relatively high concentrations of 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. 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.

B.1.4.6 HAZARDOUS WASTE MANAGEMENT

Hazardous materials used during facility construction and operations would include paints, epoxies, grease, transformer oil, and caustic electrolytes (battery fluid). 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.

B.1.4.7 DISTRIBUTED HYDROGEN SYSTEM

The project described the hydrogen use, supply and storage in the AFC, filed June 30, 2008. The hydrogen system was described as a k-bottle of hydrogen on each Power Conversion Unit (PCU). One hydrogen gas cylinder would contain approximately 195 cubic feet of hydrogen, used to replenish lost hydrogen gas within the gas circuit. Each k-bottle was to be supported from the base of the PCU boom. Each PCU's k-bottle would either need to be removed and replaced or refilled at each dish site as required (approximately two times per year). The applicant reconsidered the plan for providing hydrogen to the PCUs and has proposed an on-site hydrogen gas supply, storage and distribution system that would eliminate the need for the delivery of hydrogen k-bottles.

The June 12, 2009 Supplement to the AFC filed by the applicant modified the original project description to propose having the hydrogen gas supply produced through electrolysis by one on-site hydrogen generator. It is important to note that the hydrogen will not be generated from natural gas. The generator is capable of producing 1065 standard cubic feet of hydrogen per hour (scfh) and requires 146 watts/scf of electricity and 2.58 cubic inches of water/scf/hour during operation. Approximately 184 gallons of water per day, or 0.0133 acre feet per year would be required for this generator.

Reclaimed water would be obtained from the Seeley County Water District, processed through the on-site Water Treatment Plant to produce Demineralized Water and fed to the electrolyzer mounted on the hydrogen generator skid. The electrolyzer would eliminate any final impurities in the water prior to processing. The annual power consumption to meet the hydrogen production needs is 100KWper day, or 36.64 MW per year. Although the hydrogen generator could run full time if needed to support SunCatcher hydrogen requirements, the generator would normally be operated at off-peak electric hours using grid power. The hydrogen gas would be stored in a steel storage tank capable of storing approximately 2 days supply of hydrogen gas. It would be piped through a 1.5-inch stainless steel piping system to 87 individual compressor groups. Each compressor group will be electrically operated and consist of a compressor, delivering gas at approximately 2,900 psig, and a high pressure supply tank.

Initially, it would take 3.4 scf of hydrogen to charge the Stirling engine. Each Power Conversion Unit is estimated to lose about 200 scf per year. Each high pressure supply tank would supply hydrogen gas to 360 SunCatchers via a 0.25-inch stainless tubing. A low pressure dump tank would be installed with each compressor group utilizing a 0.25-inch stainless steel return line to recover hydrogen gas when the SunCatchers are

not in-service. This would reduce hydrogen leaks through fittings and seals on the Stirling Engine. In the event that the hydrogen generator fails, an unloading station designed to receive and transfer hydrogen gas to the storage tank would be installed to allow for the delivery of hydrogen gas to the site by an outside supplier. The hydrogen gas storage tank would provide a few days of hydrogen supply as a back-up system. SES would complete all scheduled maintenance to the hydrogen generator, when the gas supply is adequate.

B.1.4.8 TRANSMISSION SYSTEM INTERCONNECTION AND UPGRADES

This section describes the on-site substation and the transmission interconnection between the SES Solar Two Project and the existing electric grid.

The proposed project would include the construction of a new 230-kV substation approximately in the center of the project site. The applicant would need to build a 34.5-kV to 230-kV substation on 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 San Diego Gas and Electric (SDG&E) Imperial Valley Substation via an approximately 10.3-mile, double-circuit, 230-kV transmission line. Other than this interconnection transmission line, no new transmission lines or off-site substations would be required for the 300-MW Phase I construction.

For the 300-MW Phase I of the project, the first interconnection substation would initially consist of 2 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 5 120/160/200-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).

The power transformers would be protected by 230-kV power circuit breakers. Provisions would be made to expand the substation from 300 to 750 MW with the addition of 3 power transformers in Phase II of the proposed project. Each transformer would collect 150 MW of generation via 3 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.

Control, metering, and protection systems for the line, substation, and collection systems would be contained within a control building located adjacent to the substation. The control building would also contain the necessary communications equipment to meet owner, California ISO, and SDG&E 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.

The on-site portion of the interconnection transmission line would be installed in a 100-foot ROW from the SES Solar Two Project substation east and south to point

where the SDG&E Southwest Powerlink transmission line ROW crosses the southern boundary of the project. A portion of this transmission line would be routed in a surveyed linear ROW located at the north edge of the northeast quarter of Section 19. The routing was selected to minimize the distance required and to reduce the undercrossing of the line with assembled SunCatchers.

The off-site portion of the 230-kV interconnect transmission line would be routed in a 100-foot ROW parallel to the existing SDG&E 500-kV Southwest Powerlink transmission line on the southwest side until approximately the third tower from the SDG&E Imperial Valley Substation, where the line would cross under the existing 500-kV transmission line. This route was chosen to minimize effects on the flat-tailed lizard management area south of I-8 by using the existing access roads for the existing transmission line and by placing the disturbance for the interconnect transmission line immediately adjacent to an existing disturbance.

The interconnect transmission line would cross under the existing 500-kV transmission line and the proposed future second 500-kV transmission line (part of the Sunrise Powerlink project) at approximately the third tower from the SDG&E Imperial Valley Substation and will then continue due east and then due south to the point of interconnect. This crossing point is selected to maintain the routing along the existing corridor as long as possible. The transmission circuits are “rolled” between this tower and the SDG&E Imperial Valley Substation, which reduces overhead clearances for the crossing. The crossing could occur between the dead-end tower adjacent to the SDG&E Imperial Valley Substation and the SDG&E Imperial Valley Substation fence; however, a future 230-kV generator interconnect is anticipated by SDG&E from the south. SDG&E has requested that this space for crossing between the dead-end tower and the SDG&E Imperial Valley Substation fence be reserved for this future transmission line.

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 are provided for communication with SDG&E and the California Independent System Operator (California ISO).

Each set of overhead 230-kV transmission conductors to the physical connection with the existing Imperial Valley Substation 500-kV transmission line would be supported by a dead-end structure in the project’s substation and 85 to 100 double-circuit lattice steel transmission towers and/or steel poles.

B.1.5 RELATED FACILITIES

This section describes activities or projects related to the SES Solar Two Project, but outside the BLM ROW grant and Energy Commission Decision addressed in this SA/DEIS. These projects have undergone environmental review and permitting under a jurisdiction other than the BLM or Energy Commission.

B.1.5.1 SUNRISE POWERLINK PROJECT TRANSMISSION UPGRADES

The full Phase II expansion of the project, and delivery of the additional renewable power to the San Diego regional load center, would require the construction of the 500-kV Sunrise Powerlink transmission line project proposed by SDG&E. The CPUC is the lead agency for CEQA compliance and the BLM is the lead agency for National Environmental Policy Act compliance on the Sunrise Powerlink transmission line project. SDG&E received a Certificate of Public Convenience and Necessity from the California Public Utilities Commission (CPUC) for the Sunrise Powerlink project. Construction on the Sunrise Powerlink project is scheduled to begin in March 2010, with the majority of construction expected to start in June 2010 once the CPUC issues Notices to Proceed for each segment. Issuance of Notices to Proceed will be contingent upon SDG&E compliance with pre-construction requirements as specified by the approved mitigation measures.

The Sunrise Powerlink project consists of a 150-mile transmission line between Southern California's Imperial and San Diego counties. The major project components comprise:

- A new 91-mile, single-circuit 500 kV overhead electric transmission line linking SDG&E's existing Imperial Valley Substation (in Imperial County near the City of El Centro) with a new 500/230 kV Central East Substation to be constructed in the San Felipe area of central San Diego County, southwest of the intersection of County Highway S22 and S2; and
- A new 59-mile 230 kV double-circuit and single-circuit transmission line, running partly overhead and partly underground through San Diego County from the proposed new 500/230 kV Central East Substation to SDG&E's existing Peñasquitos Substation (in the City of San Diego).

Since the environmental review of the Sunrise Powerlink Project by the BLM and CPUC was completed prior to the completion of this SA/DEIS, staff did not independently review this related project.

B.1.5.2 SEELEY WASTE WATER TREATMENT FACILITY UPGRADES

After evaluating the currently available water supply options, the applicant concluded that the primary source of water for the project would be furnished by the Seeley Waste Water Treatment Facility (SWWTF). The applicant would finance upgrades to the existing treatment plant so its effluent meets Title 22 requirements for recycled water. In exchange SES Solar Two would have access to at least approximately 150,000 gallons and up to 200,000 gallons of reclaimed water per day for use in all construction and operation activities except for potable water.

SCWD serves customers in the town of Seeley, which is located in the unincorporated area of Imperial County, California, with certain utility services, including, without limitation, sewage collection and treatment services. Currently, sewage collected in Seeley's system is treated and, thereafter, flows into the New River. SCWD has signed a Will Serve Letter with the applicant to provide reclaimed water to the SES Solar Two

Project. An agreement between SCWD and SES Solar Two, LLC was signed at the Seeley Board Meeting scheduled for May 18, 2009. As a result of the terms of this Agreement, Seeley's sewage treatment facilities would be upgraded to treat 250,000 gpd and 200,000 gpd of treated effluent (Title 22 water) would be made available to SES Solar Two. This effluent level reflects SCWD's future influent levels expected due to population growth and would be provided to SES Solar Two if requested.

SCWD is the lead agency pursuant to CEQA, and is responsible for approving the upgrades to their existing wastewater treatment facility (SWWTF). The SCWD determined that a Mitigated Negative Declaration (MND) is the appropriate environmental document to be prepared in compliance with CEQA. This finding was based on the Initial Study/Environmental Impact Discussion prepared for SWWTF upgrade project. As provided for by CEQA §21064.5, an MND may be prepared for a project subject to CEQA when the project will not result in significant environmental impacts. The Draft MND was prepared by Seeley County Water District as the lead agency and in conformance with §15070, subsection (a), of the State CEQA Guidelines. The purpose of the MND and the Initial Study was to determine the potential significant impacts associated with the proposed project.

The SCWD Board of Directors approved publication of the MND for the proposed Wastewater Reclamation Facility Improvements on January 2, 2010. The public comment period was from January 2, 2010 to February 2, 2010 and a public hearing was held on February 8, 2010 at the District office in Seeley, California.

The SWCD and SES have identified an engineer, Dudek, to design the upgrade at the treatment plant. Following approval of the MND, Dudek would complete the necessary upgrades for the treatment plant to make it possible for them to supply up to 200,000 gpd of treated effluent. Seeley County Water District and the SES would bid the design improvements for completion in March 2010.

Since the environmental review of the SWWTP upgrade was completed prior to the completion of this SA/DEIS, staff did not independently review this related project.

B.1.6 CONSTRUCTION

The project would be constructed in two phases. Phase I of the project would consist of up to 12,000 SunCatchers configured in 200 1.5-MW solar groups of 60 SunCatchers per group and have a net nominal generating capacity of 300 MW. Phase II would add approximately 18,000 SunCatchers, expanding the project to a total of approximately 30,000 SunCatchers configured in 500-1.5-MW solar groups with a total net generating capacity of 750 MW (see **Project Description Figure 2)**..

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.

Project construction would be performed in accordance with plans and mitigation measures that would assure the project conforms with 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 of each technical area of this SA/DEIS.

B.1.7 OPERATION AND MAINTENANCE

The SES Solar Two Project would be an "as-available" resource. Therefore, the project would operate anywhere between a minimum of approximately 18 MW net when the first units are interconnected to the grid during the construction period to 750 MW on completion of construction. The capability for independent operation of all 30,000 units would give maximum flexibility in operations. The applicant expects that the project would have an annual availability of 99 percent.

The project would be dispatched by the California ISO, through day-ahead, hour-ahead, and real-time scheduling, as required to meet the demands of the Southern California market. The market would dictate unit operations and total power requirements. The SES Solar Two Project would operate approximately 3,500 hours per annum and is expected by the applicant to have an overall availability of 99 percent or higher. The number of available operating hours is determined by the availability of the sun's energy at greater than 250 watts per square meter. SunCatchers would be unable to generate electricity when the sun's energy is below 250 watts per square meter in the early morning or late evening hours and when cloud cover limits the sun's energy for power generation. Also, SunCatchers would be unable to generate electricity during daylight hours when the wind speed exceeds 35 miles per hour, as SunCatchers would be stowed in a safe de-track position at this wind speed to prevent damage. SunCatchers are designed to withstand wind speeds of 50 miles per hour in the operating mode and 90 miles per hour in the stowed position. Because the SunCatchers move slowly, they start moving into stow position once winds reach 35 miles per hour in order to be in stow position by the time winds reach 90 miles per hour. Because of the geographical size of the project, cloud cover and/or wind conditions may only affect a portion of the project at any given time.

It is expected that the SES Solar Two Project would be operated with a staff of approximately 164 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.

B.1.8 DECOMMISSIONING AND RESTORATION

Introduction

Project closure can be temporary or permanent. Temporary closure is defined as a shutdown for a period exceeding the time required for normal maintenance, including closure for overhaul or replacement of the major components, such as major transformers, switchgear, etc. 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.

Temporary Closure

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.

Permanent Closure

The planned life of the SES Solar Two 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.

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 will 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

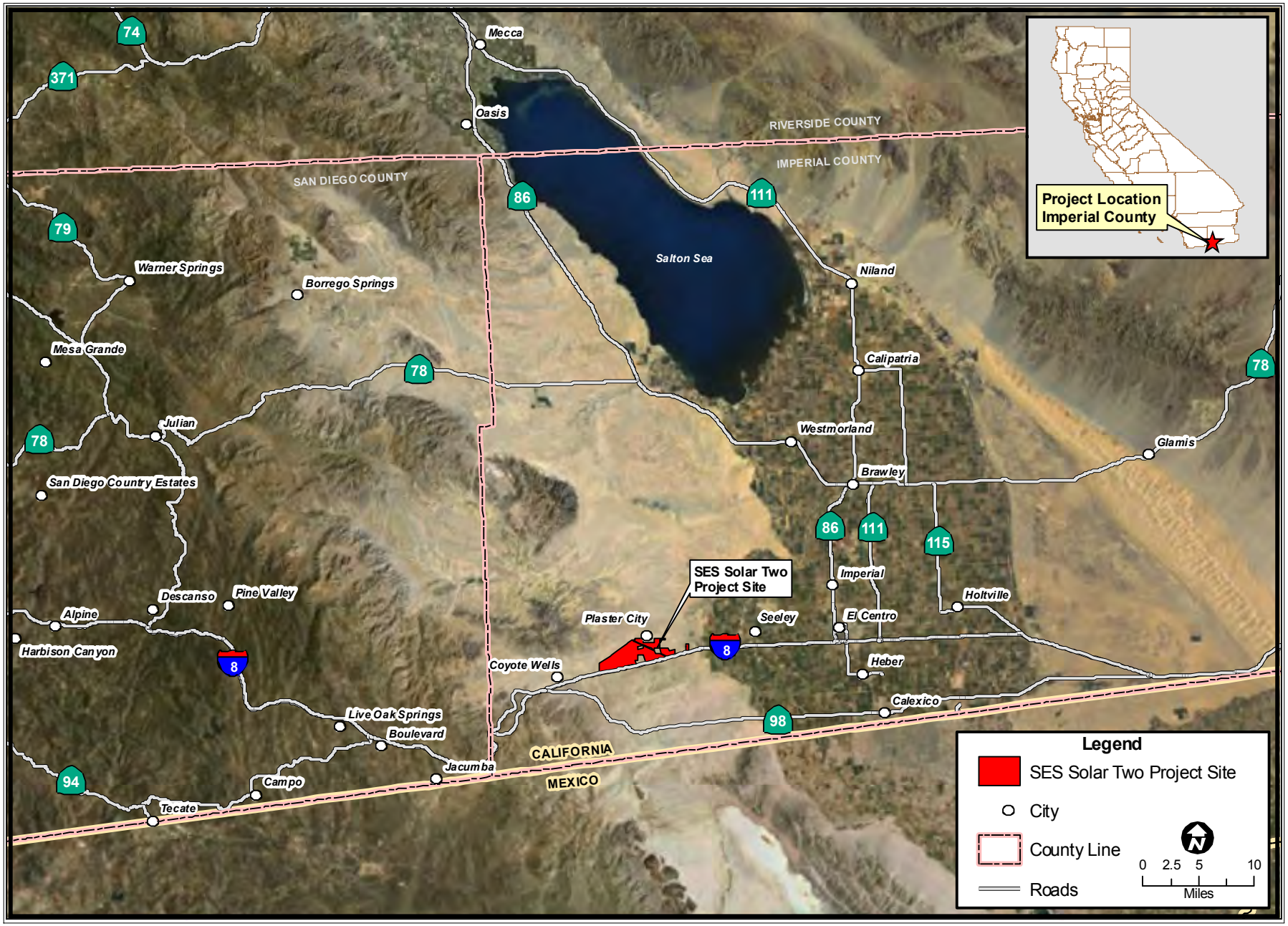
- associated costs of the proposed decommissioning and the source of funds to pay for the decommissioning.

In general, the decommissioning plan for the project will attempt to maximize the recycling of project components. SES Solar Two will attempt to sell unused chemicals back to the suppliers or other purchasers or users. Equipment containing chemicals will 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 SES Solar Two will provide periodic update reports to the Energy Commission, the BLM, and other appropriate parties.

Similar to project construction and facility operations, decommissioning would be performed in accordance with plans and mitigation measures that would assure the project conforms with 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 SA/DEIS.

PROJECT DESCRIPTION - FIGURE 1

SES Solar Two - Regional Overview Map

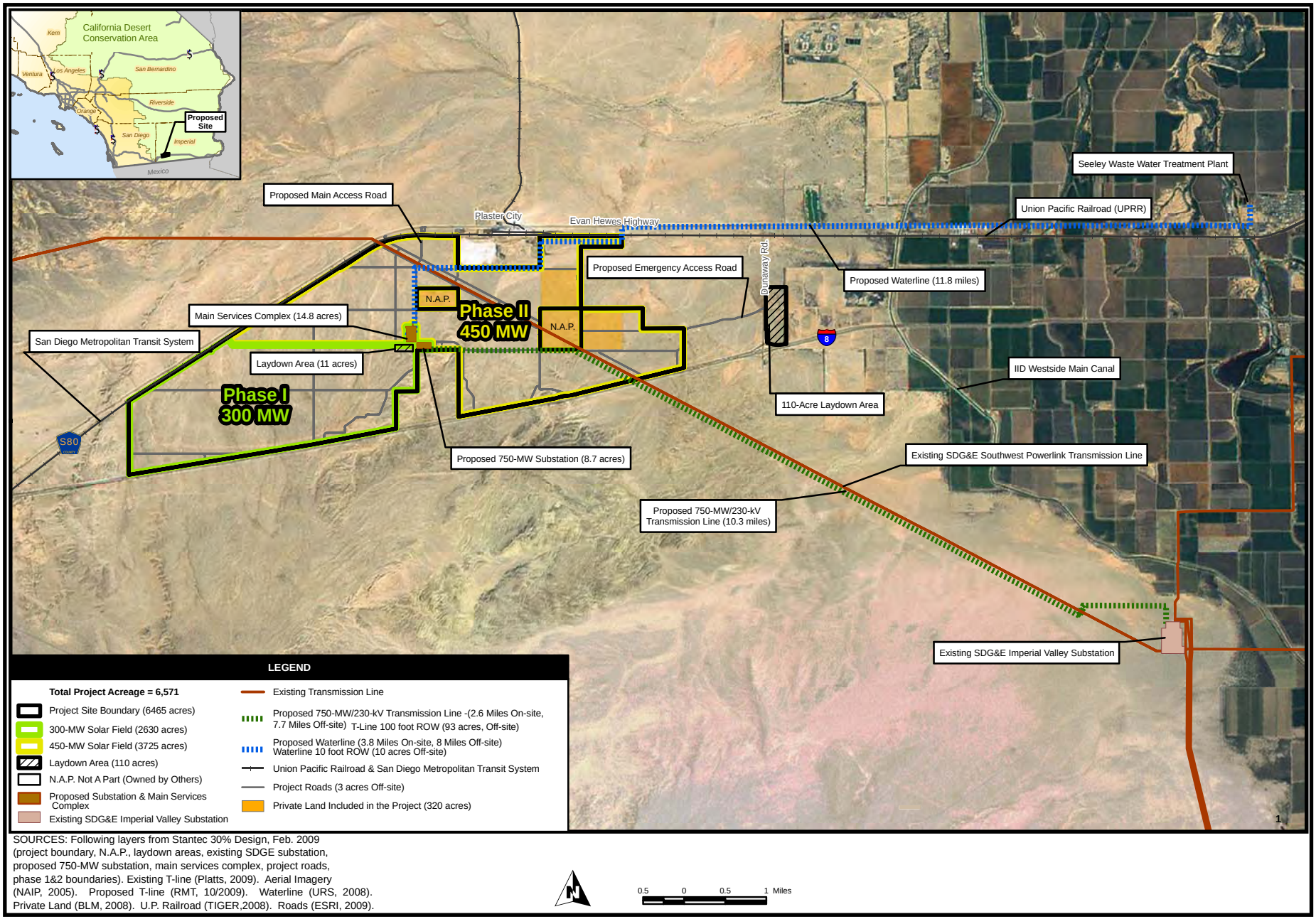


CALIFORNIA ENERGY COMMISSION, SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, FEBRUARY 2010

SOURCE: ESRI Image - Multinet 09 Roads- URS Corp.

PROJECT DESCRIPTION - FIGURE 2

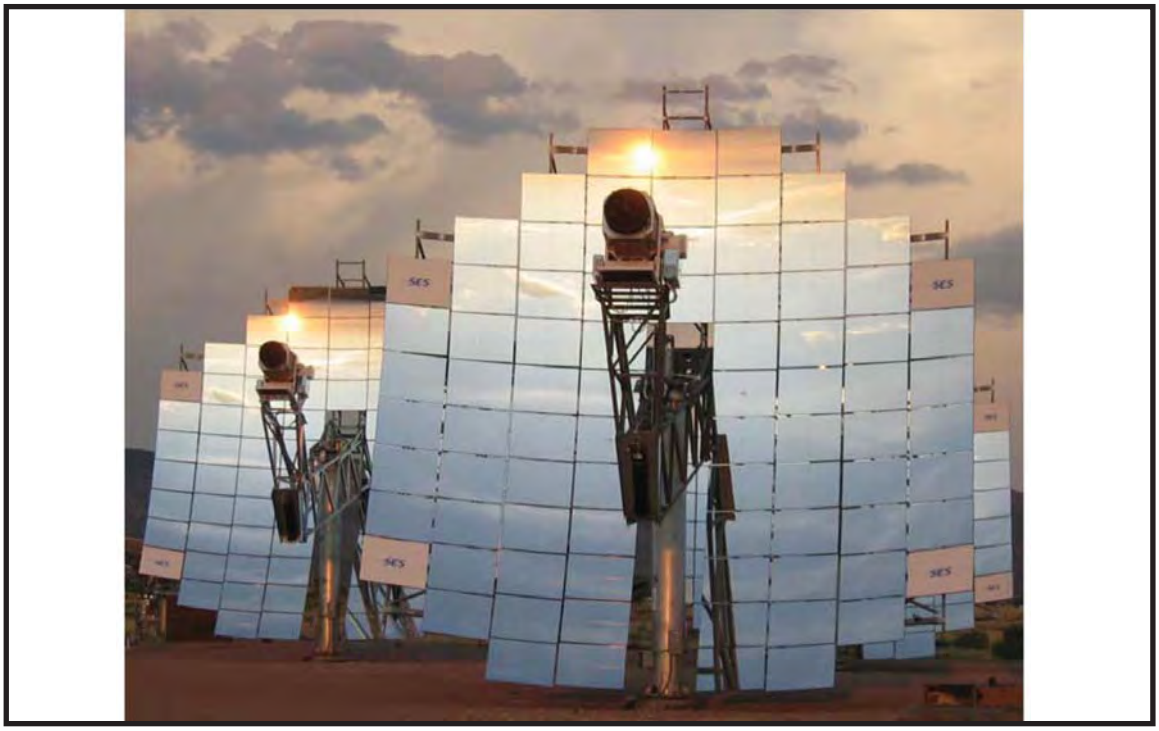
SES Solar Two - Project Overview Map

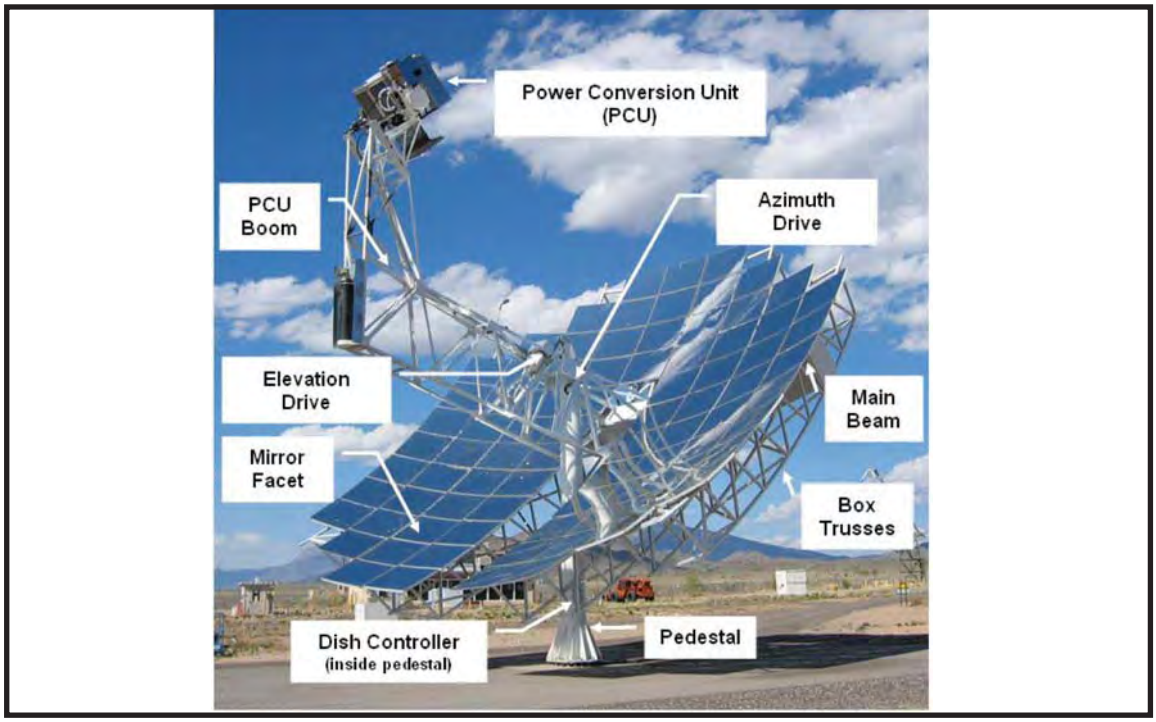


SOURCES: Following layers from Stantec 30% Design, Feb. 2009 (project boundary, N.A.P., laydown areas, existing SDGE substation, proposed 750-MW substation, main services complex, project roads, phase 1&2 boundaries). Existing T-line (Platts, 2009). Aerial Imagery (NAIP, 2005). Proposed T-line (RMT, 10/2009). Waterline (URS, 2008). Private Land (BLM, 2008). U.P. Railroad (TIGER,2008). Roads (ESRI, 2009).

SOURCE: 08-AFC-5, Figure 1

PROJECT DESCRIPTION - FIGURE 3
SES Solar Two - SunCatcher Details

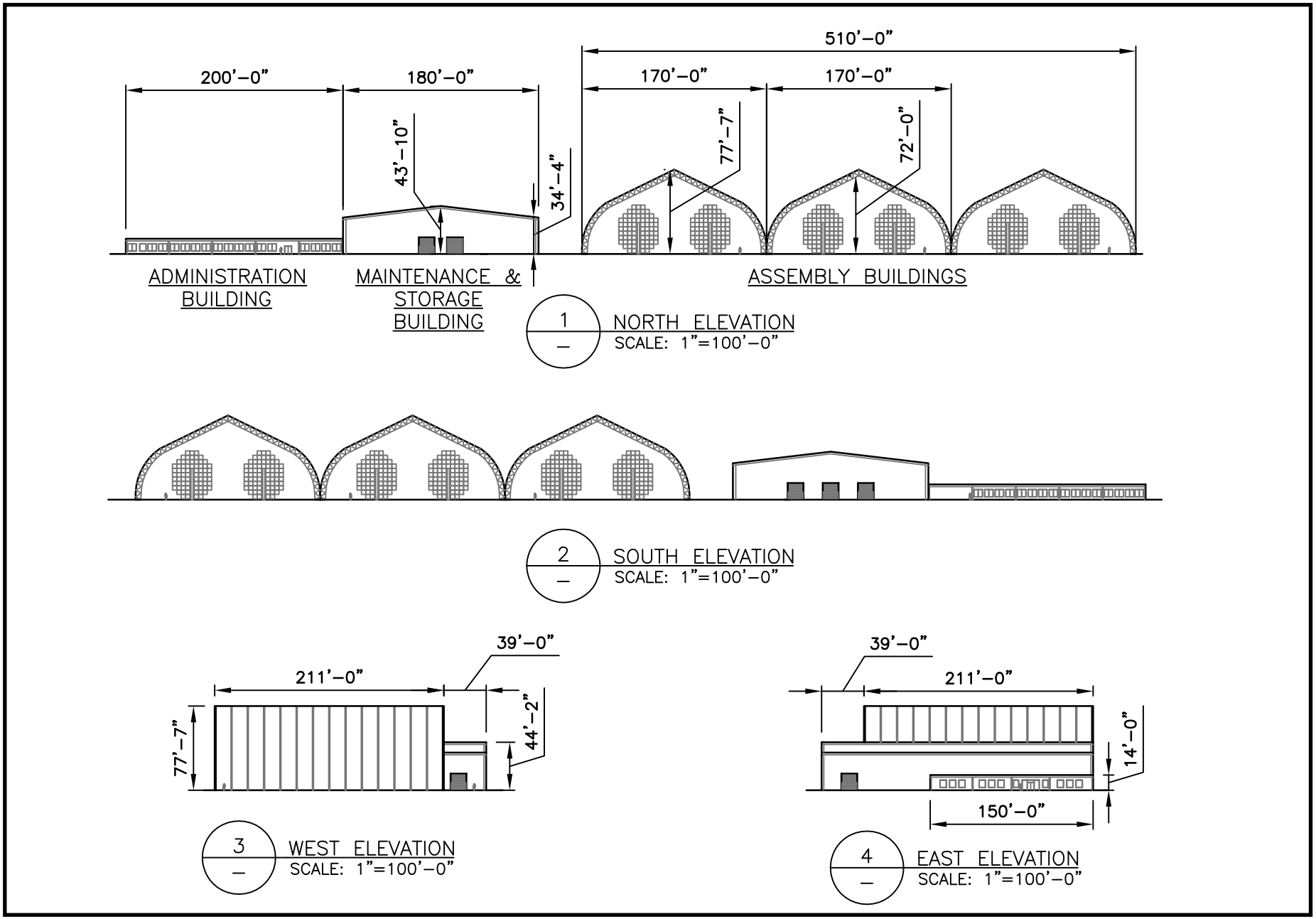




CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, FEBRUARY 2010
SOURCE: AFC Photograph 1-1 and 1-2

PROJECT DESCRIPTION - FIGURE 4

SES Solar Two - Main Services Complex Elevation View



SOURCE: AFC Figure 3-26

B.2 - ALTERNATIVES

Susan V. Lee

B.2.1 SUMMARY OF CONCLUSIONS

In this analysis of the Stirling Energy Systems Solar Two Project, 27 alternatives have been developed and evaluated in addition to the proposed project. These include eight alternative site locations, three alternatives that would reduce effects to jurisdictional waters of the United States, a range of solar and renewable technologies, generation technologies using different fuels, conservation/demand-side management, and a 300 MW Alternative to the proposed 750 MW proposed project.

Of the 27 alternatives, four alternatives were determined to be reasonable by the Bureau of Land Management and feasible by the Energy Commission and have the potential to result in reduced impacts in comparison with the proposed project: the 300 MW Alternative, two of the alternatives that would reduce effects to waters of the United States, and the No Project/No Action Alternative. The Bureau of Land Management would consider four alternatives including alternatives to issuance of the land use plan amendment.

CEC Staff have determined that the No Project/No Action Alternative is not superior to the proposed project because it would likely delay development of renewable resources or shift renewable development to other similar areas, and would lead to increased operation of existing power plants that use non-renewable technologies.

The 300 MW Alternative would substantially reduce impacts in comparison to the proposed project. The two drainage avoidance alternatives were developed to lessen impacts to waters of the U.S. and to be practicable. Three of the eight site alternatives are evaluated in detail by the Energy Commission and evaluated under the California Environmental Quality Act only: the Mesquite Lake Alternative, Agricultural Lands Alternative, and South of Highway 98 Alternative. While the impacts of these three sites would be similar to those of the proposed site in many resource elements, all three of these alternative sites are likely to have less severe cultural and visual impacts than the proposed site, and two of the three alternative sites (located on disturbed lands) would also have reduced impacts to biological resources.

The alternative sites evaluated under the California Environmental Quality Act only would present challenges not present at the proposed site. The alternative sites are all less than 6,500 acres. Because these alternative sites would have fewer environmental and engineering constraints and are more level than the proposed site, it is possible that a smaller site would still allow development of a 750 MW facility. If the project were not able to be constructed on less than 6,500 acres, the individual alternative site(s) considered here would not meet project requirements and a combination of two separate alternative sites would be anticipated to be necessary. This would increase the cost of the project due to the need for additional infrastructure (transmission, water, etc.).

The Mesquite Lake Alternative presents an additional challenge: it is made up of approximately 70 parcels with 52 separate landowners. Due to the number of parcels

that would have to be acquired, obtaining site control would be more challenging at this site. At the proposed site, BLM is the primary land management entity although there are some private parcels within the proposed project site.

All offsite alternatives are considered unreasonable by the Bureau of Land Management because, as discussed below, none would accomplish the purpose and need for the proposed action.

Alternative solar thermal technologies (parabolic trough, solar power tower, utility scale solar photovoltaics, and linear Fresnel) are also evaluated. As compared with the proposed Stirling technology, these technologies would not substantially change the severity of visual impacts, biological resources impacts and cultural impacts, though land requirements vary among the technologies. Distributed generation solar photovoltaic facilities (i.e., photovoltaic panels placed on surfaces such as rooftops and parking lots) would likewise require extensive acreage, although they would minimize the need for undisturbed open space. However, increased deployment of distributed solar photovoltaics faces challenges in manufacturing capacity, cost, and policy implementation.

Other generation technologies (wind, geothermal, biomass, tidal, wave, natural gas, and nuclear) are also examined as possible alternatives to the project. These technologies would either be infeasible at the scale of the Stirling Energy Systems Solar Two project, or they would create their own significant adverse impacts in other locations. For example, a natural gas plant would use substantially less land and avoid cultural and biological resources impacts, but it would contribute to greenhouse gas emissions and would not meet the project's renewable generation objective. Construction of new nuclear power plants is currently prohibited under California law.

Conservation and demand side management programs would likely not meet the state's growing electricity needs that would be served by the Stirling Energy Systems Solar Two project. In addition, these programs would not provide the renewable energy required to meet the California Renewable Portfolio Standard requirements.

Staff's analysis of renewable energy technology options indicates that contributions from each commercially available renewable technology will be needed to meet SDG&E's RPS requirements and to achieve the statewide RPS target for 2020 (between 45,000 GWhs to almost 75,000 GWhs according to the 2009 IEPR). Wave and tidal technologies are not yet commercially available in the United States. Therefore, the combined contribution of the alternatives of wind, distributed solar photovoltaic, geothermal, and biomass is needed to complement rather than substitute for SES Solar Two's solar thermal contribution to meeting SDG&E and statewide RPS requirements. The table below indicates that each of these four alternative technology options when considered individually, is insufficient to meet the project objectives related to the RPS.

Alternatives Table 1 lists the alternatives retained for analysis in this SA/DEIS and those eliminated, and summarizes the rationale for each conclusion.

Alternatives Table 1
Summary of Alternatives Retained and Eliminated

Alternative	Rationale for Retention or Elimination
Alternatives Retained for CEQA and NEPA Analysis	
Proposed Project/Action - 750 MW - 6,500 acres - 30,000 SunCatchers	Evaluated as the applicant's proposal.
300 MW Alternative - 300 MW - 2,600 acres (40% of proposed) - 12,000 SunCatchers	Evaluated in the SA/DEIS because it would substantially reduce impacts of the SES Solar Two Project and meet the purpose and need of the BLM's proposed action.
Drainage Avoidance #1 Alternative - 632 MW - 4,690 acres (72% of proposed) - 25,000 SunCatchers	Evaluated in the SA/DEIS because it would substantially reduce impacts to waters of the U.S. and meet the purpose and need of the BLM's proposed action.
Drainage Avoidance #2 Alternative - 423 MW - 3,153 acres (49% of proposed) - 10,240 SunCatchers	Evaluated in the SA/DEIS because it would substantially reduce impacts to waters of the U.S. and meet the purpose and need of the BLM's proposed action.
No Project/No Action Alternative	Required under CEQA and NEPA. Note that additional NEPA No Action Alternatives are described below under Land Use Plan Amendment Alternatives.
Land Use Plan Amendment Alternatives Evaluated Only under NEPA	
Authorize SES Solar Two project through a CDCA Land Use Plan amendment	Action required under the CDCA Plan of 1980, as amended.
Authorize a reduced size project within the proposed project's boundaries through a CDCA Land Use Plan amendment (300 MW Alternative, Drainage Avoidance #1 or #2 Alternatives)	A smaller project reduces impacts; site location is an action for which an amendment to the CDCA Plan of 1980, as amended, is required.
Do not approve the ROW grant and do not amend the CDCA Land Use Plan of 1980, as amended.	The first No Action Alternative: deny the ROW application and does not amend the CDCA Land Use Plan of 1980.
Do not approve the ROW grant and amend the CDCA Land Use Plan of 1980, as amended, to make the area unavailable for future solar development.	The second No Action Alternative: deny the ROW application and amend the CDCA Land Use Plan of 1980 to make the site unavailable for any future solar development.

Alternative	Rationale for Retention or Elimination
Do not approve the ROW grant and amend the CDCA Land Use Plan of 1980 to make the area available for future solar development.	The third No Action Alternative: deny the ROW application but amend the CDCA Land Use Plan of 1980 to make the site available for future solar development.
Site Alternatives Evaluated only under CEQA	
Mesquite Lake Alternative	Would substantially reduce impacts of the SES Solar Two Project while meeting most project objectives.
Agricultural Lands Alternative	Would substantially reduce impacts of the SES Solar Two Project while meeting most project objectives.
South of Highway 98 Alternative	Would substantially reduce impacts of the SES Solar Two Project while meeting most project objectives.
Alternatives Eliminated from Detailed Analysis	
Alternative Site #1	Would not substantially reduce impacts of the SES Solar Two Project; located in Department of Defense (DOD) “no fly” “no build” area therefore not a feasible alternative for the Stirling engine technology; pending right-of-way grant application for the site, therefore not considered a viable alternative.
Alternative Site #2	Would not substantially reduce impacts of the SES Solar Two Project; located in DOD “no fly” “no build” area therefore not a feasible alternative for the Stirling engine technology; pending right-of-way grant application for the site, therefore not considered a viable alternative.
Alternative Site #3	Would not substantially reduce impacts of the SES Solar Two Project; pending right-of-way grant application for the site, therefore not considered a viable alternative.
Wind Zero Site (Ocotillo)	Alternative site was eliminated as infeasible because of the pre-existing proposed use as a private military training facility. Currently undergoing environmental review.
Parabolic Trough Technology	Would not substantially reduce impacts of the SES Solar Two Project.
Solar Power Tower Technology	Would not substantially reduce impacts of the SES Solar Two Project.
Linear Fresnel Technology	Would reduce area required by about 40% but would not eliminate significant impacts of the SES Soar Two Project.
Solar Photovoltaic Technology – Utility Scale	Would not substantially reduce impacts of the SES Solar Two Project.

Alternative	Rationale for Retention or Elimination
Distributed Solar Technology	While it will very likely be possible to achieve 750 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 SES Solar Two project. Barriers exist related to interconnection with the electric distribution grid. Also, solar PV is one of the 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	While there are substantial wind resources in western Imperial and eastern San Diego Counties, environmental impacts could also be significant so wind would not reduce impacts in comparison to the SES Solar Two Project. Also, wind is one of the components of the renewable energy mix required to meet the California Renewable Portfolio Standard requirements, so additional technologies like solar thermal generation, would also be required.
Geothermal Energy	Despite the encouragement provided by Renewable Portfolio Standards and ARRA funding, few new geothermal projects have been proposed in the Imperial Valley and no geothermal projects are included on the Renewable Energy Action Team list of projects requesting ARRA funds. Therefore, the development of 750 MW of new geothermal generation capacity within the timeframe required for the SES Solar Two solar project is considered speculative.
Biomass Energy	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 75 and 250 facilities would be needed to achieve 750 MW of generation, creating substantial adverse impacts.
Tidal Energy	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 SES Solar Two Project.
Wave Energy	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	Would not attain the objective of generating renewable power meeting California's renewable energy needs
Coal	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	The permitting of new nuclear facilities in California is not currently allowable by law

Alternative	Rationale for Retention or Elimination
Conservation and Demand-side Management	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
Avoidance of Waters of the U.S.	Would not attain the objective of generating sufficient renewable power

B.2.2 INTRODUCTION

Stirling Energy Systems Solar Two, LLC[1] (SES) proposes to build the Stirling Energy Systems (SES) Solar Two solar facility on federal land under the administrative jurisdiction of the BLM. Since the Bureau of Land Management (BLM) is a federal agency, the SES Solar Two power plant is subject to review under the National Environmental Policy Act (NEPA) in addition to CEQA. The purpose of this alternatives analysis is to comply with State and Federal environmental laws by providing an analysis of a range of reasonable alternatives which, under CEQA, would feasibly attain most of the basic objectives of the project but would substantially lessen or avoid any potentially significant adverse impacts of the proposed project, or under NEPA, would inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment [40 CFR 1502.1]. This section summarizes the potentially significant adverse impacts of the proposed project and analyzes different technologies and alternative sites that may reduce or avoid some or all of those significant adverse impacts.

Of the 27 alternatives, three alternatives in addition to the proposed project were determined to be reasonable by both the BLM and Energy Commission: the 300 MW Alternative and two of the alternatives that would reduce effects to waters of the United States. These alternatives and the no project/no action alternative are analyzed in further detail within each of the technical sections of this document, and are considered for selection as the preferred alternative by both agencies.

This section presents analysis of three site alternatives that are evaluated under CEQA only and presents the plan amendment alternatives evaluated under NEPA only. The section also presents the discussion and analysis of all alternatives eliminated from consideration by both the Energy Commission and the BLM.

B.2.3 ALTERNATIVES DEVELOPMENT AND SCREENING PROCESS

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

SES proposes to build the SES Solar Two facility on federal land within the jurisdiction of the BLM. Since the BLM is a federal agency and the California Energy Commission

[1] The formal company name is now Tessera Solar, but the application was filed as Stirling Energy Systems.

has State authority to license thermal power plants, the SES Solar Two power plant is subject to review under both NEPA and CEQA.

California Environmental Quality Act Criteria

The *Guidelines for Implementation of the California Environmental Quality Act*, Title 14, California Code of Regulation, section 15126.6(a), provides direction by requiring 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 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 of which the effect cannot be reasonably ascertained and of which the implementation is remote and speculative (Cal. Code Regs., tit. 14, § 15125(d)(5)).

National Environmental Policy Act Criteria

NEPA requires that the decision-makers and the public be fully informed of the impacts associated with the proposed project. The intent is to make decisions based on an understanding of environmental consequences, and to take actions to protect, restore, and enhance the environment.

Regulations promulgated by the Council on Environmental Quality require that an EIS rigorously explore and objectively evaluate all reasonable alternatives to a proposed action. Reasonable alternatives are those for which effects can be reasonably ascertained, whose implementation is not remote or speculative, that are feasible, effective, are not remote from reality, and those that are consistent with the basic policy objectives for management of the area. (40 CFR 1502.14; CEQ Forty Questions, No. 1A; Headwaters, Inc. v. BLM, 914 F.2d. 1174 (9th Cir. 1990)). Reasonable alternatives are dictated by the nature and scope of the proposed action. To determine reasonable alternatives, an agency must define the purpose and need of the proposal. The purpose and need of the proposed action is to be evaluated under a reasonableness standard. CEQ regulations state that an agency should include reasonable alternatives not within the jurisdiction of the lead agency [40 CFR 1502.14(c)]. BLM interprets this to apply to exceptional circumstances and limits its application to broad, programmatic EISs that would involve multiple agencies. For most actions, the purpose and need statement should be constructed to reflect BLM's discretion consistent with its decision space under its statutory and regulatory requirements. Thus, alternatives that are not within BLM jurisdiction would not be considered reasonable. Further, "[i]n determining the scope of alternatives to be considered, the emphasis is on what is 'reasonable' rather than on whether the proponent or applicant likes or is itself capable of carrying out a particular alternative..." (CEQ Forty Questions, No. 2a.)

Consideration of a No Action Alternative is mandated by NEPA. As with the CEQA No Project Alternative, this is the scenario that would exist if the proposed project were not constructed and no land use plan amendment were undertaken. Under the first No

Action Alternative, the land would continue to be managed by BLM under the existing management plan as defined in the California Desert Conservation Area plan. This SA/DEIS also evaluates two other No Action Alternatives: one in which the project could be disapproved, but the plan amendment approved to allow other solar projects, and one in which the project would be disapproved and a plan amendment implemented to prohibit solar or renewable project development at the site.

U.S. Army Corps of Engineers Regulations

Federal regulations require that if waters of the U.S. are affected by a proposed project, alternatives must be considered that reduce effects on the waters of the U.S. These regulations are presented in CFR 40 Part 230 Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material, Subpart B--Compliance With the Guidelines, Sec. 230.10 Restrictions on discharge. Those regulations require that the Corps prepare a “404(b)1 Analysis” to evaluate alternatives.

Regarding the Corps’ required alternatives analysis, the regulations state the following:

> (a) Except as provided under section 404(b)(2), no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences.
>
> (1) For the purpose of this requirement, practicable alternatives include, but are not limited to:
>
> > (i) Activities which do not involve a discharge of dredged or fill material into the waters of the United States or ocean waters;
> >
> > (ii) Discharges of dredged or fill material at other locations in waters of the United States or ocean waters;
>
> (2) An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. If it is otherwise a practicable alternative, an area not presently owned by the applicant, which could reasonably be obtained, utilized, expanded or managed in order to fulfill the basic purpose of the proposed activity may be considered.
>
> (3) Where the activity associated with a discharge which is proposed for a special aquatic site (as defined in subpart E) does not require access or proximity to or sighting within the special aquatic site in question to fulfill its basic purpose (i.e., is not "water dependent"), practicable alternatives that do not involve special aquatic sites are presumed to be available, unless clearly demonstrated otherwise…

To meet these requirements, this alternatives analysis fully considers two alternatives within the boundaries of the proposed project, as described in Section B.2.4. In addition, a range of other alternatives that comply with the Corps’ guidelines are presented in Section B.2.6 (alternatives considered but eliminated from detailed analysis), and additional offsite alternatives are presented in Section B.2.5 (Site Alternatives Evaluated Under CEQA).

B.2.4 SCREENING METHODOLOGY

To prepare the alternatives analysis, the following methodology was used:

1. Develop an understanding of the project, identify the basic objectives of the project, and describe its potentially significant adverse impacts.
2. Identify and evaluate technology alternatives to the project such as increased energy efficiency (or demand-side management) and the use of alternative generation technologies (e.g., solar or other renewable or nonrenewable technologies).
3. Identify and evaluate alternative locations.
4. Evaluate potential alternatives to select those qualified for detailed evaluation. Under NEPA, explore and evaluate all reasonable alternatives, and of those reasonable alternatives, identify those that would avoid or minimize adverse impacts or enhance the quality of the human environment.
5. Evaluate the impacts of not constructing the project, known as the No Project alternative under CEQA and the No Action alternative under NEPA.

Based on this methodology, each potential alternative was evaluated according the following criteria for its ability to:

- for CEQA purposes, avoid or substantially lessen one or more of the potential significant adverse effects of the project as described above;
- for CEQA purposes, meet most or all of the project objectives;
- for NEPA purposes, be consistent with BLM's purpose and need, and be otherwise reasonable.

B.2.4.1 APPLICANT'S PROJECT OBJECTIVES

Two primary objectives are set forth by Stirling Energy Systems (SES 2008a):

- to provide clean, renewable, solar-powered electricity and to assist San Diego Gas & Electric (SDG&E) in meeting its obligations under California's Renewable Portfolio Standard Program (RPS);
- to assist SDG&E in reducing its greenhouse gas emissions as required by the California Global Warming Solutions Act.

Additionally, Stirling Energy Systems states the purpose of the project as:

- to provide up to 750 MW of renewable electric capacity under a 20-year power purchase agreement (PPA) to SDG&E;
- to contribute to the achievement of the 20% renewables RPS target set by California's governor and legislature;
- to assist in reducing greenhouse gas emissions from the electricity sector;
- to contribute to meeting California's future electric power needs, and

- to assist the California Independent System Operator (CAISO) in meeting its strategic goals for the integration of renewable resources, as listed in its Five-Year Strategic Plan for 2008-2012.

B.2.4.2 PROJECT OBJECTIVES OF THE ENERGY COMMISSION (CEQA)

After considering the objectives set out by the applicant, the Energy Commission has identified the following basic project objectives, which are used to evaluate the viability of alternatives in accordance with CEQA requirements:

- to construct and operate an up to 750 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 solarity with ground slope of less than 5%.

In addition, when considering retention or elimination of alternative renewable technologies, in addition to evaluating the likelihood of reducing or eliminating the potential impacts of SES Solar Two at its proposed site, staff evaluated whether alternative technologies could meet the following key project objectives:

- to provide clean, renewable electricity and to assist San Diego Gas & Electric (SDG&E) in meeting its obligations under California's Renewable Portfolio Standard Program (RPS);
- to assist SDG&E in reducing its greenhouse gas emissions as required by the California Global Warming Solutions Act; and
- to contribute to the achievement of the 33% RPS target set by California's governor and legislature.

B.2.4.3 PURPOSE AND NEED FOR PROPOSED PROJECT AND PLAN AMENDMENT (BLM)

Bureau of Land Management. Federal orders and laws require government agencies to expedite the review of energy related projects to the extent allowed by law, evaluate energy generation projects and facilitate the development of renewable energy sources. The Energy Policy Act of 2005 (EPAct) encourages the United States Department of the Interior (DOI), BLM's parent agency, to approve at least 10,000 MW of renewable energy on public lands by 2015. Executive Order 13212, dated May 18, 2001, mandates that agencies expedite their "review of permits or take other actions as necessary to accelerate the completion of such projects, while maintaining safety, public health, and environmental protections" in the "production and transmission of energy in a safe and environmentally sound manner."

Secretarial Order 3283, *Enhancing Renewable Energy Development on the Public Lands*, requires the BLM to ensure that processing and permitting of renewable energy projects complies with the requirements of the National Environmental Policy Act, Endangered Species Act, National Historic Preservation Act, and all other laws and regulations; improve efficiencies in the processing of renewable energy applications and the consistent application of renewable energy policies; and develop Best Management

Practices for renewable energy projects on public lands to ensure the most environmentally responsible development of renewable energy, among other things.

Secretarial Order 3285, *Renewable Energy Development by the Department of the Interior* requires BLM to encourage the development of environmentally responsible renewable energy generation. Both of these Secretarial Orders will be considered in responding to the SES application for the proposed Solar Two Project.

SES has filed an application with BLM for a land use right-of-way (ROW) grant pursuant to the Federal Land Policy and Management Act (FLPMA, 43 USC 1761). Under FLPMA Title V Section 501 (a)(4) (Rights-of-Way), the United States Secretary of the Interior, as delegated to the BLM, is authorized to grant ROW on lands under the jurisdiction of the BLM for the purpose of allowing systems for generation, transmission, and distribution of electric energy.

The BLM's purpose and need for the Solar Two project is to respond to the SES application under Title V of FLMPA for a ROW grant to construct, operate and decommission a solar thermal facility and associated infrastructure in compliance with FLPMA, BLM ROW regulations, and other applicable federal laws. The BLM will decide whether to approve, approve with modification, or deny issuance of a ROW grant to SES for the proposed Solar Two Project, BLM's actions will also include concurrent consideration of amending the California Desert Conservation Area (CDCA) Plan of 1980. The decision the BLM will make is whether or not to grant a ROW and, if so, under what terms and conditions, and whether or not to amend the land use plan.

As discussed in Section A, solar power facilities are an allowable use of lands under BLM jurisdiction in Multiple Use Class (MUC) L (limited use) areas. Since the site for the proposed Solar Two Project is currently classified within an MUC L area, solar power facilities are generally allowed. However, Chapter 3, the “Energy Production and Utility Corridors Element” of the CDCA Plan requires that newly proposed sites associated with power generation or transmission facilities not already identified in the Plan will be considered through the plan amendment process. The proposed SES Solar Two project site is not currently identified in the proposed power facility and transmission line element within the Plan. As such, a plan amendment is required in order to approve the site location consistent with the CDCA Plan.

Department of Energy. SES has also applied to the United States (U.S.) Department of Energy (DOE) for a loan guarantee pursuant to Title XVII of the EPAct. Title XVII of EPAct authorizes the United States Secretary of Energy to make loan guarantees for a variety of types of projects, including those that “avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases, and employ new or significantly improved technologies as compared to commercial technologies in service in the United States at the time the guarantee is issued.” The two principal goals of the loan guarantee program are to encourage commercial use in the United States of new or significantly improved energy-related technologies and to achieve substantial environmental benefits. The purpose and need for action by DOE is to comply with their mandate under EPAct by selecting eligible projects that meet the goals of the Act.

B.2.4.4 SUMMARY DESCRIPTION OF THE PROPOSED PROJECT AND PROJECT IMPACTS

Section B.1 of the SA/DEIS provides a detailed description of the proposed project, and a summary is presented here as context for the alternatives analysis. The proposed SES Solar Two project is a nominal 750 MW solar plant located on approximately 6,144 acres of public lands and 360 acres of private lands. The project is divided into two phases:

- Phase I would include 12,000 SunCatchers located on approximately 2,550 acres and would create 300 MW of solar energy; and
- Phase II would include 18,000 SunCatchers located on approximately 3,500 acres and would create 450 MW of energy.
- Additional acreage would be required for the operation and administration buildings, the maintenance building, and the substation building.

Each phase is divided into groups consisting of 60 SunCatchers that would create 1.5 MW and be connected in series of 3, 6, and 9 MW. These groups would be clustered and connected to overhead collection lines at 48 or 51 MWs.

The project also includes a new electrical substation, a 10.3-mile transmission line interconnection with San Diego Gas and Electric's (SDG&E) Imperial Valley Substation, and a water pipeline. The 10.3-mile transmission line is part of the application submitted to the BLM for this ROW grant and will be built, operated and owned by the applicant. The existing SDG&E's Imperial Valley Substation is not part of the application submitted to the BLM for a ROW grant.

Based on the analysis presented in the technical sections of this Staff Assessment/Draft Environmental Impact statement (SA/DEIS), the following impacts have been identified as issues of greatest concern for the proposed SES Solar Two project:

- **Cultural Resources**: Due to the undisturbed nature of the area, the extremely high frequency of identified cultural resources on or adjacent to the proposed project site, and the potential for unidentified cultural resource sites, the SES Solar Two project would create impacts to numerous cultural resources. The installation of 30,000 SunCatchers and associated facilities over the 6,500-acre project site would affect 328 known archaeological sites. Although the nature of the installation of the SunCatcher technology allows for reduced ground disturbance relative to other solar technologies and flexibility in the location of the individual units, the construction of the project would, nonetheless, lead to the whole and partial destruction of a number of cultural resources. Note that the cultural resources on the site are being evaluated under Section 106 of the National Historic Preservation Act.
- **Biological Resources**: The SES Solar Two site supports a diversity of mammals, birds, and reptiles, including some special-status wildlife species. Grading on the site will not directly or indirectly impact sensitive plant communities or wetlands, but will result in direct impacts to some special-status animal species and possibly special-status plant species and in the removal of vegetation that provides cover, foraging, and breeding habitat for wildlife to a 6,063.1-acre site. Implementation of Conditions of Certification required in the SA/DEIS would reduce impacts to less than significant

levels. The SES Solar Two project would impact ephemeral washes with the placement of the SunCatchers in the bed of the washes which would disrupt the hydrological and biological functions and processes of the ephemeral washes. Culverts will also be placed in the larger washes for the roads that cross the larger ephemeral washes. Though CDFG jurisdictional streambeds would be mitigated to less than significant levels, this would not be the case for the waters of the U.S., so alternatives must be considered to reduce these impacts.

- **Air Quality**: With the adoption of the Conditions of Certification discussed in the Air Quality Section of this SA/DEIS, the SES Solar Two project would comply with all applicable laws, ordinances, regulations, and standards and would not result in any significant air quality-related CEQA impacts. Additionally, the SES Solar Two project would emit substantially less greenhouse gas emissions per megawatt-hour produced than fossil fueled generation resources in California.
- **Soils and Water**: Stream morphology on the site could be affected through: a) increased production of sediment from the watershed surface; b) placement of obstructions in the flow path resulting in local scour and potential diversions; c) clearing of vegetation within channels and increasing sediment transport capacity; and, d) installing sediment basins throughout the site to mitigate for increased sediment production. The result could be excess sediment deposition at culverts and bridges along the Evan Hewes Highway and parallel railroad, and toward the east in the direction of the Westside Main canal. Other effects could occur as described above. The level of analysis developed in the AFC and supporting documents is not sufficient to resolve uncertainties regarding the ability of the proposed mitigation measures to reduce sedimentation and stream morphology impacts to a level less than significant. In the absence of a detailed, site-specific sediment transport analysis specifically addressing these issues, these stream morphology impacts are considered a significant adverse impact of the project.
- **Visual Resources**: The SES Solar Two project would substantially degrade the existing visual character and quality of the site and its surroundings, including views as seen by motorists on Highway I-8, from recreational destinations within the Yuha Desert Area of Critical Environmental Concern (ACEC), and from portions of the Juan Bautista de Anza National Historic Trail, resulting in significant impacts. Because effective, feasible mitigation measures could not be identified by staff, these impacts are considered to be unavoidable. The BLM's interim Visual Resources Methodology considers the project area to be Interim VRM Class Rating was determined to be Class III[2].
- **Cumulative Impacts**: Cumulative impacts to biological resources include contributions to the cumulative loss of habitat for native plant communities and wildlife, including special-status species. SES Solar Two would also contribute to the cumulative increase in avian and other predators in the area, increasing predation pressures on

[2] Interim VRM rating of Class III was defined in the Sunrise Powerlink Transmission Project EIR/EIS (CPUC, 2009). VRM Class III is defined as an area where the objective is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate or lower. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

FTHL. Cumulative impacts to land use would be considered significant and unavoidable because the cumulative land use conversion resulting from the proposed project, along with the impacts of past and foreseeable projects in the region would preclude numerous existing land uses including recreation, rangeland, and open space. The anticipated cumulative visual impacts of the SES Solar Two project in combination with past and foreseeable future local projects in the West Mesa/Yuha Desert region of southwestern Imperial County, and past and foreseeable future region-wide projects in the southern California desert are considered cumulatively considerable, potentially significant, and unavoidable.

The alternatives analysis focuses on the consideration of these impacts and the extent to which they could be reduced or eliminated by alternatives to the proposed project.

B.2.5 SUMMARY OF SCOPING AND SCREENING RESULTS

The public scoping comment period allowed the public and regulatory agencies an opportunity to comment on the scope of the SA/DEIS, comment on the alternatives considered, and identify issues that should be addressed in the SA/DEIS. The discussion below presents the key issues identified from the written and oral comments received during the scoping process on the SES Solar Two project. The specific issues raised during the public scoping process are:

- Concerns regarding the project's purpose and need and the project's relationship to the Sunrise Powerlink project
- Concerns regarding the viability of the proposed technology
- Concerns regarding alternatives, suggestions for project phasing, alternative sites and smaller sites, alternative technologies, and distributed rooftop solar
- Concerns regarding funding of the project
- Potential air quality impacts, requests to identify project emissions
- Potential impacts to rare, declining, and listed species and their associated desert habitat and water use;
- Potential impacts to the flat-tailed horned lizard, big horn sheep, and burrowing owl
- Cumulative and regional impacts including those of other renewable energy projects in the region and on BLM lands
- Potential impacts to cultural resources and the need for consultation with Tribal governments
- Potential environmental justice impacts
- Potential impacts of hazardous wastes
- Potential impacts to land use, conflicts with federal State, Tribal or local land use plans, recreation uses in the project area, and use of public/BLM lands
- Potential risk associated with soil fungi and risks for Valley Fever
- Concern regarding glare from mirrors to aircraft

- Potential damage/risks associated with seismic activity
- Need for information on skill levels for the kinds of job that will be created
- Need for a traffic study that includes the Centinela State Prison
- Potential visual impacts and effects on visual resources in the area
- Evaluate project need for water and impacts to water supply, direct and indirect effects on groundwater.

Scoping comments are also listed in **Introduction Table 1** of the **Introduction** section of this SA/DEIS and in the BLM's Final Scoping Report.

B.2.6 ALTERNATIVES EVALUATED UNDER NEPA AND CEQA

Section B.2.1 describes the requirements for evaluation of alternatives under NEPA, CEQA, and the Corps' requirements for 404(b)1 analyses. This section describes the three alternatives to the proposed project that are retained for analysis: the 300 MW (Phase 1) Alternative, the Drainage Avoidance #1 Alternative, the Drainage Avoidance #2 Alternative, as well as the No Project/No Action Alternative. The proposed project is described in Section B.1. The proposed project and the retained alternatives are evaluated under both NEPA and CEQA in Sections C and D (Environmental and Engineering Analysis).

B.2.6.1 300 MW ALTERNATIVE

The 300 MW Alternative would essentially be Phase 1 of the proposed 750 MW project as defined by SES. The boundaries of this alternative are shown in **Alternatives Figure 1A** (all figures are presented at the end of this section). The 300 MW Alternative would consist of 12,000 SunCatchers with a net generating capacity of approximately 300 MW occupying approximately 2,600 acres of land. This alternative would retain 40% of the proposed SunCatchers and would affect 40% of the land of the proposed 750 MW project.

Similar to the proposed project, the 300 MW Alternative would transmit power to the grid through the SDG&E Imperial Valley Substation and would require infrastructure including a water supply pipeline, transmission line, road access, operations facilities, substation, and hydrogen system (SES 2008a). This infrastructure would require approximately 40 acres.

The 300 MW Alternative is evaluated in this SA/DEIS because it is reasonable and would substantially lessen all of the impacts of the project. Additionally, the 300 MW Alternative would allow the applicant to demonstrate the success of the Stirling engine technology and construction techniques, while resulting in reduced impacts to the desert environment. Such a limited or phased alternative was suggested in numerous scoping comments.

Under the 300 MW Alternative, the Energy Commission and BLM would approve only the 300 MW facility, and not the 750 MW project that is proposed. While the proposed project would be phased (300 MW, then the remaining 450 phased), the 300 MW

Alternative would occur in one phase and would not include additional phases leading to the total 750 MW facility. Under this alternative a ROW grant for the appropriate acreage would be issued, and the CDCA plan would be amended to include the SES Solar Two project power generation facilities and transmission line as an approved site under the Plan.

This alternative is analyzed in section C and D, below, within each resource element subsection.

B.2.6.2 DRAINAGE AVOIDANCE #1 ALTERNATIVE

The first of two alternatives developed to reduce impacts to the waters of the U.S. would prohibit permanent impacts within the 10 primary drainages within the proposed project boundaries. This alternative is illustrated in **Alternatives Figure 1B**. This alternative would have the same outer project boundaries as the proposed project, but it would prohibit installation of permanent structures within the ten primary drainages, thereby reducing the available acreage for development from 6,500 to 4,690, and reducing the generation capacity from 750 MW under the proposed project to 632 MW (84% of the proposed generation capacity). Rather than the 30,000 SunCatchers included in the proposed project, there would be approximately 25,000 of them installed.

This alternative was developed by the Corps with the following intent:

- It would avoid permanent effects on all "Primary" Waters of the U.S. ("primary" streams are shown in **Alternatives Figure 1B**).
- Tributaries to these main stems are considered "secondary" streams and are not fully avoided in this alternative.
- This alternative would allow for limited road and transmission line crossings through "primary" streams, but not installation of sun catchers within the waters of the U.S.
- Transmission crossings below the existing grade would have temporary impacts and road crossings would be designed to have minimal impacts. Minimal impacts means that arch crossings, bottomless culverts, or bridges would be used that allow full conveyance of hydrology and sediment and if necessary wildlife movement).

Under this alternative a ROW grant for the appropriate acreage would be issued, and the CDCA plan would be amended to include the SES Solar Two project power generation facilities and transmission line as an approved site under the Plan. This alternative is analyzed in Sections C and D, below, within each resource element subsection.

B.2.6.3 DRAINAGE AVOIDANCE #2 ALTERNATIVE

The Drainage Avoidance #2 Alternative would eliminate both the eastern and westernmost portions of the proposed project, where the largest drainage complexes are located. This alternative is shown in **Alternatives Figure 1C**. It would reduce the overall size of the project area by over 50% (from 6,500 acres to 3,153 acres). It would also reduce the generation capacity from 750 MW to 423 MW (retaining only about 32% of the proposed number of SunCatchers). In this alternative, permanent structures (SunCatchers) would be allowed within all drainages inside the revised, smaller project

boundaries, but the only development allowed outside of the alternative boundaries would be access roads and transmission line crossings.

This alternative was developed by the Corps with the following intent:

- The alternative would avoid most severe effects on tributaries to the New River and the Salton Sea by avoiding the largest drainage complexes.
- It would avoid effects on all "primary" and "secondary" streams on both the western and eastern edge of the proposed project area with the exception of limited road and transmission line crossings required to serve the remaining center project segment (as described in Drainage Avoidance #1 Alternative, above.

Under this alternative a ROW grant for the appropriate acreage would be issued, and the CDCA plan would be amended to include the SES Solar Two project power generation facilities and transmission line as an approved site under the Plan.

This alternative is analyzed in Sections C and D, below, within each resource element subsection.

B.2.6.4 NO PROJECT/NO ACTION ALTERNATIVE

CEQA No Project Alternative

The No Project Alternative under CEQA defines the scenario that would exist if the proposed SES Solar Two Project were not constructed. The CEQA Guidelines state that “the purpose of describing and analyzing a ‘no project’ alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project” (Cal. Code Regs., tit. 14 § 15126.6(i)). The No Project analysis in this SA/DEIS considers existing conditions and “what would be reasonably expected to occur in the foreseeable future if the project were not approved…” (Cal. Code Regs, tit. 14 § 15126.6(e)(2)).

If the No Project Alternative were selected, the construction and operational impacts of the SES Solar Two project would not occur. There would be no grading of the site, no loss of resources or disturbance of approximately 6,500 acres of desert habitat, and no installation of power generation and transmission equipment. The No Project Alternative would also eliminate contributions to cumulative impacts on a number of resources and environmental parameters in Imperial County and in the Colorado Desert as a whole.

In the absence of the SES Solar Two project, however, other power plants, both renewable and non-renewable, may have to be constructed to serve the demand for electricity and to meet RPS. The impacts of these other facilities may be similar to those of the proposed project because these technologies require large amounts of land like that required for the SES Solar Two Project. The No Project/No Action Alternative may also lead to siting of other non-solar renewable technologies to help achieve the California RPS.

Additionally, if the No Project/No Action Alternative were chosen, additional gas-fired power plants may be built, or that existing gas-fired plants may operate longer. If the proposed project were not built, California would not benefit from the reduction in

greenhouse gases that this facility would provide, and SDG&E would not receive the 750 MW contribution to its renewable state-mandated energy portfolio.

NEPA No Action Alternatives

Under NEPA, the No Action Alternative is used as a benchmark of existing conditions by which the public and decision makers can compare the environmental effects of the proposed action and the alternatives. Like the No Project Alternative described above, under the No Action Alternative, the impacts of the SES Solar Two project would not occur.

BLM is considering two separate actions (whether to approve a plan amendment and whether to approve the proposed project or an alternative). BLM's "action alternative" would be to amend the CDCA Plan to include SES Solar Two project (750 MW), and to approve the project as proposed (750 MW). The SES Solar Two 750 MW project and ancillary facilities are approved, a ROW grant is issued, and the CDCA Plan is amended to include the SES Solar Two power generation facilities and transmission line as an approved site under the Plan. Similarly, BLM could amend CDCA Plan to include one of the alternatives fully analyzed in this Draft EIS (the 300 MW, Drainage Avoidance #1, or Drainage Avoidance #2 alternatives), and approve the construction and operation of those alternatives. The alternative and ancillary facilities would be approved, a ROW grant for the appropriate acreage would be issued, and the CDCA Plan would be amended to include the alternative power generation facilities and transmission line as an approved site under the Plan.

BLM's alternatives related to the No Action Alternative and the Plan amendment are the following:

- **No Action on project but amend the CDCA plan to make the area available for future solar development.** The SES Solar Two project is not approved (project denied), and no ROW grant is issued to SES, but the CDCA plan is amended to make the project area available for large scale renewable energy development under a future project.
- **No Action on project and amend the CDCA plan to make the area unavailable for future solar development.** The SES Solar Two project is not approved (project denied), and no ROW grant is issued to SES, and the CDCA plan is amended to make the project area unavailable for large scale renewable energy development.
- **No Action on project application and on land use plan amendment**. The SES Solar Two project is not approved (denied), no ROW grant is issued, and no CDCA Plan amendment is approved. There is no consideration of information that would allow approval of a CDCA Plan amendment that would make the land available for large scale energy development in the future.

Each of these No Action Alternatives is addressed under each resource element of Sections C and D.

B.2.7 SITE ALTERNATIVES EVALUATED ONLY UNDER CEQA

Three site alternatives are evaluated by the Energy Commission under CEQA only. BLM considers these alternatives in the category of "considered but eliminated from detailed analysis" because they would be inconsistent with BLM's purpose and need for the action under consideration or are otherwise unreasonable alternatives under NEPA. An unreasonable alternative under NEPA is one whose effects cannot be reasonably ascertained, whose implementation is remote or speculative, which is infeasible, ineffective, and remote from reality; which is inconsistent with basic policy objectives for management of the area. Reasonable alternatives are dictated by the nature and scope of the proposed action and are defined by the purpose and need. Because the offsite alternatives are not under BLM jurisdiction, BLM would have no discretionary approval authorities for those alternatives.

Two of the alternative sites evaluated in this section (Mesquite Lake and Agricultural Lands Alternatives) are located on private lands. The third alternative site evaluated under CEQA only (South of Highway 98 Alternative) is on land under the jurisdiction of the Bureau of Reclamation; it was withdrawn from the operation of the public land laws due to its proximity to the All American Canal. This site is within the area identified by BLM as a Solar Study Area for the Solar Programmatic EIS now being prepared.

The Energy Commission does not have the authority to approve an alternative or require SES to move the proposed project to another location, even if it identifies an alternative site that meets the project objectives and avoids or substantially lessens one or more of the significant adverse effects of the project. Implementation of an alternative site would require the applicant to submit a new Application for Certification (AFC), including revised engineering and environmental analyses. This more rigorous AFC-level analysis of any of the alternative sites could reveal environmental impacts; nonconformity with laws, ordinances, regulations, and standards; or potential mitigation requirements that were not identified during the more general alternatives analysis presented herein. Preparation and review of a new AFC for the SES Solar Two Project on an alternative site would require substantial additional time.

Alternatives sites for the SES Solar Two Project were suggested in scoping comments as a means to reduce the project impacts to undisturbed land and desert environments. The Mesquite Lake Alternative was suggested by scoping comments, and numerous scoping comments suggested consideration of a private/disturbed land alternative. Scoping comments stated that because the Stirling technology is developed in clusters, it is not necessary for the solar facility site to be on a single contiguous parcel. The South of Highway 98 Alternative was identified by the Renewable Energy Transmission Initiative (RETI) process as a proxy solar project. It is currently under consideration by the BLM and DOE in the Solar Programmatic EIS as a Solar Energy Study Area.

The three alternative sites considered in the analysis in this SA/DEIS are illustrated on **Alternatives Figure 2** at the end of this section:

- Mesquite Lake Alternative
- Agricultural Lands Alternative
- South of Highway 98 Alternative

Site Selection Criteria

The following site selection criteria identified in the SES Solar Two AFC were used to choose the proposed site (SES 2008a):

- facility should be located in an area of long hours of sunlight (low cloudiness), insolation should be at a level of seven kilowatt-hours per square meter per day;
- the site should be relatively flat, site grade may be up to 5%;
- wind speed of more than 35 miles per hour less than 2% of the time;
- land must be available for sale or use, landowner must be willing to negotiate a long-term option agreement so that site control does not require a large capital investment until license is obtained;
- project must be located in close proximity to high-voltage California Independent System Operator (CAISO) transmission lines with adequate capacity and should have an adequate water supply;
- site should have ease of access and close proximity to access roads;
- site should have few or no environmentally sensitive areas (particularly biological and cultural resources) and should allow development with minimal environmental impacts;
- proposed use should be consistent with existing laws, ordinances, regulations, and standards;
- site should be located on property currently available at a reasonable cost.

The site criteria do not state a minimum acreage required for a 750 MW Stirling engine system facility. Within the 6,500 acres for which SES has requested a ROW grant from BLM, approximately 3,000 acres would be graded for the project, including access roads and infrastructure (SES 2008a). It is assumed that additional acreage (above 3,000) would be required for project design and to avoid shading; however, the exact amount of total acreage required is unclear. Because the site alternatives do not contain major washes or sensitive habitat and cultural resources, it is possible that less than 6,500 acres would be required for a 750 MW facility at one or more of those sites. If the project were not able to be constructed on less than 6,500 acres, the individual alternative sites considered here would not meet project requirements and a combination of portions of two alternative sites would be necessary. This would increase the cost of the project due to the need for additional infrastructure (transmission, water, etc.).

In a June 2009 comment letter, Audubon California and other groups defined the following list of criteria for areas to avoid in siting renewable projects:

- Locations that support sensitive biological resources, including: federally designated and proposed critical habitat; significant populations of federal or state threatened and endangered species, significant populations of sensitive, rare and special status species, and rare or unique plant communities;
- Areas of Critical Environmental Concern, Wildlife Habitat Management Areas, proposed Habitat Conservation Plan and Natural Community Conservation Plan Conservation Reserves;

- Lands purchased for conservation including those conveyed to the BLM;
- Landscape-level biological linkage areas required for the continued functioning of biological and ecological processes;
- Proposed Wilderness Areas, proposed National Monuments, and Citizens' Wilderness Inventory Areas;
- Wetlands and riparian areas, including the upland habitat and groundwater resources required to protect the integrity of seeps, springs, streams or wetlands;
- National Register of Historic Places eligible sites and other known cultural resources;
- Locations directly adjacent to National or State Park units.

During the FLPMA ROW grant pre-application period, BLM worked closely with the project applicant to identify a feasible site without known environmental concerns. This effort resulting in a identification of the propose site, which does reflect many of the suggested criteria for siting presented by Audubon California as noted above. As a result of the pre-application activity (pre-scoping activity), and the scoping and public comment process, alternative sites considered in this SA/EIS were selected based on an attempt to meet as many of these criteria as possible.

Other Sites on BLM Land

The BLM has received a large number of utility-scale solar energy project proposals for BLM-administered lands throughout California. The BLM processes solar energy ROW grant applications under its Solar Energy Development Policy (Instructional Memorandum No. 2007-097) and addresses environmental concerns for the utility-scale energy projects on a case-by-case basis in conformance with its existing policies, manuals, and statutory and regulatory authorities. Under its existing regulations, BLM determines if competing applications exist for the same facility or system. Applications that are first in time are given priority in consideration and are not considered competing applications with those filed later in time.

In addition, another site with an active pending application (Site 2) is not a reasonable alternative to a proposed project, such as SES Solar Two. Site 2 is not a reasonable alternative because selection and approval of Site 2 in lieu of the proposed project (or one of its alternatives) is remote and speculative. If BLM were to consider Site 2 as an alternative to the proposed project, it would inherently be making a determination of reasonableness of the proposed alternative. However, an active pending application for Site 2 commands priority in consideration for that site location just as an active pending application for the SES Solar Two site commands priority for its site location. Unless and until the active pending application for Site 2 is eliminated from consideration, the BLM would not approve the Site 2 alternative over the proposed project, in this case SES Solar Two. Therefore, an alternative site on BLM land with an active pending application for another project is not considered a reasonable alternative to the proposed project for purposes of alternatives analysis.

The BLM and DOE are preparing a Programmatic Environmental Impact Statement (PEIS) on solar energy development in six states in the western U.S. (Arizona, California, Colorado, New Mexico, Nevada, and Utah) (USDOE 2008). As part of that PEIS, the

BLM and DOE identified 24 tracts of BLM-administered land for in-depth study for solar development, some or all of which may be found appropriate for designation as solar energy zones in the future. The public scoping period on the solar energy zone maps ended in September 2009. The Draft PEIS is anticipated to be published in 2010.

B.2.7.1 MESQUITE LAKE ALTERNATIVE

Scoping comments requested that the Mesquite Lake area be considered as an alternative site because it is disturbed land and is zoned for industrial use. The Mesquite Lake Specific Plan defines Mesquite Lake as an area that is bordered by Keystone Road to the north, Highway 86 to the west, Harris Road to the south, and approximately 2,250 feet east of Old Highway 111 to the east. **Alternatives Figure 3** shows the Mesquite Lake Specific Plan area.

This land was previously used primarily for agriculture. The Mesquite Lake Specific Plan Area encompasses approximately 5,100 acres of land; however, some of this land is already in use. However, approximately 2,150 additional acres may be available immediately north of the Mesquite Lake Specific Plan Area. This is because, in the 1993 General Plan, Imperial County designated a Specific Plan Area that consists of approximately 11.5 square miles (approximately 7,250 acres) extending between SR 86 on the west, SR 111 on the east and bordered by Harris Road on the south and Carey Road on the north as an area for new job-producing light, medium, and heavy industrial uses (Imperial County 2006). In 2006, the Mesquite Lake Specific Plan Area scaled back the Specific Plan Area to 5,100 acres and identifies the additional 2,150 acres as a future expansion zone.

The Mesquite Lake Alternative would require approximately 6,500 acres to construct the 750 MW solar facility and associated facilities. Because the layout for the SES Solar Two project at the proposed site is based on avoiding major washes and sensitive habitat and cultural resource areas whenever possible, it is possible that fewer than 6,500 acres would be required at the Mesquite Lake Specific Plan Area because it is flatter and does not include large washes as does the proposed SES Solar Two site.

The Mesquite Lake Specific Plan Area encompasses 5,100 acres. The Holly Sugar Plant is located in the northwest corner. One non-operational alternative-fuel-burning electric power plant, the Mesquite Lake Recovery Facility and one operational biomass facility, the Imperial Valley Resource Recovery Plant, are located within the plan boundaries (Imperial County 2006). Some crop production occurs at the site and there are several fish production ponds; however, due to the alkalinity of the soil, much of the agricultural land is currently fallow.

The Mesquite Lake Specific Plan Area is made up of approximately 70 parcels with 52 land owners. A number of these parcels have been advertised for sale on local realty websites. The land north of the Mesquite Lake Specific Plan Area, identified in the 1993 General Plan Specific Plan Area, includes additional separate parcels. Due to the number of parcels that would have to be acquired to accommodate a 750 MW alternative on this site, this alternative would make obtaining site control more challenging (in comparison to obtaining a right-of-way grant to use 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 suitable for solar development only if there were no more than 20 owners in a two-square-mile (1,280-acre) area.

The Mesquite Lake Specific Plan Area is located approximately one mile north of the City of Imperial and approximately four miles south of the City of Brawley. The Mesquite Lake region has a solar potential of between 6.75 and 8 kilowatt hours (kWh)/meter squared (m^2)/day (CEC 2008a). The elevation of the site is approximately 75 to 140 feet below mean sea level and severe tropical storms have been known to cause shallow inundation in the area (Imperial County 2006). The site would be accessed via SR 86, from the Keystone Road exit. Existing structures are located at the northwest and northeast corners of the plan area and existing fish ponds are located along part of the southern boundary.

Four projects have applied for use of land in the Mesquite Lake Specific Plan Area. According to the 2006 Master EIR for the area, the projects proposed for use of this land include:

- Liberty X Biofuels Power, LLC, a new 17.5 MW thermal electric plant located on a 38-acre site on Keystone Road, west of SR 111;
- Holly Sugar/Imperial Bioresources, LLC, proposes an upgrade to the existing Holly Sugar/Imperial Sugar Beet Factory which would include adding the processing of sugar cane to the existing sugar beet factory and would also include the production of ethanol from corn and sugar cane;
- Palo Verde Valley Disposal Service on a 25-acre site that would become a waste collection facility north of Harris Road and approximately 1,650 feet east of SR 111; and
- The NEAC, LLC, Compressed Hay Facility, a project on 142 acres located at the northeast corner of SR 111 and Harris Road.

The Union Pacific Railroad and Rose Canal run through the Mesquite Lake Alternative site. The Imperial Irrigation District (IID) is the energy supplier in the region, and there is currently a 92 kV transmission line located along the west side of Dogwood Road and two 34.5 kV sub-transmission lines located along the west side of SR 111 (Imperial County 2006). These lines have limited capacity to accommodate new development (Imperial County 2006). As with the proposed SES Solar Two project, the Mesquite Lake Alternative would include a water supply line, a hydrogen system, an onsite water treatment facility, and an evaporation pond.

Transmission Interconnection. The Mesquite Lake Alternative would require approximately 25 miles of new 230 kV transmission line to reach the Imperial Valley Substation. The transmission line would follow the existing IID 92 kV ROW. It would exit the alternative site just west of Dogwood Road. and continue south for approximately 4.5 miles until the intersection of Dogwood Road and West Aten Road. The transmission interconnection would parallel the existing IID 230 kV ROW from this intersection until reaching the Imperial Valley Substation. At the intersection of Dogwood Road and West Aten Road, the transmission route would turn west for approximately 7 miles, then turn south approximately 4.5 miles, crossing over I-8. Approximately 0.5 miles south of I-8, the transmission line would turn west for approximately 2 miles, then it turn south for 1.9

miles along County Hwy S29. The route would turn west for approximately 1.4 miles at West Wixom Road, then south for 1.4 miles along Liebert Road to enter the Imperial Valley Substation from the north.

Environmental and Engineering Assessment of the Mesquite Lake Alternative

Air Quality

Environmental Setting. Each local air quality district in California establishes its own significance criteria for environmental review of projects based on the specific conditions within each air basin. Like the proposed SES Solar Two project, the Mesquite Lake Alternative site is in the Salton Sea Air Basin, regulated by the Imperial County Air Pollution Control District, (ICAPCD). The pollutants of concern for Imperial County are ozone (O3) and particulate matter that is 10 microns or less in diameter or 2.5 microns or less in diameter (Imperial County 2006). More specific information regarding the Salton Sea Air Basin and ICAPCD can be found in the **Air Quality** section of this SA/DEIS.

Environmental Impacts. Air quality impacts would principally consist of exhaust emissions from on-site, off-road and gasoline-powered construction equipment (*e.g.,* ozone precursors, NOx and VOC; other criteria pollutants, such as CO and PM10; and toxic diesel particulate matter emissions) and fugitive particulate matter (dust) from travel on unpaved surfaces. These emissions are described in the **Air Quality** Section of the SA/EIS for the proposed project and would be essentially the same at any site.

Exhaust emissions would also be caused by workers commuting to and from the work sites, from trucks hauling equipment and supplies to the sites, and crew trucks (e.g., derrick trucks, bucket trucks, pickups). Because of the remoteness of the alternative site, workers and trucks hauling equipment and supplies would have to commute 8 miles (to El Centro) or 120 miles (to San Diego) to reach the Mesquite Lake Alternative. The proposed site for the SES Solar Two project is located approximately 15 miles from El Centro and 100 miles east of San Diego.

Emissions from the Mesquite Lake Alternative would need to be controlled to satisfy the air permitting requirements of the ICAPCD. As such, construction and operation of a 750 MW project at the Mesquite Lake Alternative site would be subject to permit requirements, and it would require Energy Commission mitigation, similar to that of the proposed SES Solar Two project, to avoid significant air quality impacts. Appropriate mitigation at the Mesquite Lake Alternative site would likely involve similar, locally oriented recommendations such as the Conditions of Certification presented in the **Air Quality** section of this SA/DEIS to reduce PM10 impacts.

Comparison to Proposed Project. The construction and operation emissions resulting from building a 750 MW solar power plant at the Mesquite Lake Alternative site would be similar to those of the SES Solar Two project at the Plaster City Region.

Biological Resources

The Mesquite Lake Alternative site is located in an agricultural area of Imperial County. The primary land cover is active and inactive agricultural land. Rose Canal traverses the west-central portion of the site from north to south. Several smaller unnamed irrigation

canals are also present on site. The Holly Sugar Corporation occupies the northwestern corner, and Memory Gardens Cemetery is located further south along the western site boundary. Surrounding lands are active and inactive agriculture. The New River is located approximately two miles to the west of the site.

A reconnaissance survey of the alternative site was conducted in December, 2009. Reconnaissance surveys included visiting representative samples of habitat throughout the proposed and alternative site, by driving roads in and adjacent to the SES Solar Two project site and each alternative, as applicable, as well as conducting brief habitat assessments on foot for parcels with public access. Plant and animal species observed were noted, as well as potentially jurisdictional features. A jurisdictional feature includes a feature that is under the jurisdiction of a local, State or federal agency such as the Waters of the United States (including wetlands) which are regulated by the U.S. Army Corps of Engineers (COE) under Section 404 of the Clean Water Act. Aerial interpretation also was used for areas with restricted access and/or time constraints. Sensitive species with potential to occur on each alternative were determined by a habitat-based analysis and by consulting the California Natural Diversity Database (CNDDB).

The majority of the Mesquite Lake Alternative site is active and inactive agriculture comprised of hay fields, fallow fields, cattle grazing, a fish farm, processing plant, and equipment staging areas. Small areas of highly disturbed Sonoran desert scrub occur in a scattered distribution on site and include creosote bush, alkali goldenbush, and desert-thorn (*Lycium* sp.) as typical species. Patches of tamarisk scrub occur along portions of some on-site irrigation canals, as well as in a stand north of the cemetery. The entire site is highly disturbed and degraded from ongoing agricultural activities.

The Mesquite Lake Specific Plan Area Master EIR identified three vegetation communities within the plan area: bush seepweed-iodine bush scrub, tamarisk scrub, and disturbed wetlands (Imperial County, 2006). These plant communities are described below. As noted earlier, the majority of the area is in agricultural uses or fallow agricultural uses.

<u>Bush Seepweed-Iodine Bush Scrub.</u> Bush seepweed-iodine bush scrub is a community dominated by shrubs in the Chenopodiaceae family. This community occurs on moist valley bottoms and lake beds. The sites supporting this community have poorly drained soils with extremely high alkalinity and/or salt content. A total of 729.7 acres of bush seepweed-iodine bush scrub, of which 562.2 acres are disturbed, occur within the Mesquite Lake Specific Plan Area (Imperial County, 2006).

<u>Tamarisk Scrub</u>. Irrigation drains and canals, low-lying areas, and berms surrounding some old drainage ponds support tamarisk scrub, freshwater marsh and/or exotic, herbaceous wetland species. Most of the concrete-lined drains and canals do not support vegetation. Vegetation is restricted to the earthen facilities (Imperial County 2006). Tamarisk scrub occurs along sandy or gravelly braided washes or intermittent streams, often in areas where high evaporation increases the stream's salinity. Within the specific plan area, this community occurs sporadically along the drains and canals, along the berms of agriculture ponds, and in low-lying areas with a high water table. A total of 287.5 acres of tamarisk scrub occurs within the Specific Plan area. Included in this total are approximately 64.5 acres of disturbed tamarisk scrub (Imperial County 2006).

Disturbed Wetlands. Many of the earthen drains and canals within the study area are periodically cleared of vegetation to improve water flow and reduce evapotranspiration losses from the vegetation. Areas classified as disturbed wetlands support herbaceous species such as salt grass and Mexican sprangletop (*Leptochloa uninervia*), with an occasional small woody species such as tamarisk. A total of 6.6 acres of disturbed wetlands occurs in the specific plan area (Imperial County 2006).

Agriculture. The majority of the specific plan area consists of agricultural lands. This includes fields in active cultivation, and fields that have been fallow only a short period of time and have not yet been colonized by the bush seepweed community species discussed above. A total of 2,244.3 acres of active and fallow agricultural land, including the aquaculture facility, occur within the specific plan area (Imperial County 2006).

Alternatives Table 2 lists the sensitive species found in CNDDB records between one and five miles of the alternative site. These records are primarily associated with native habitat areas along the New River, rather than agricultural lands. No critical habitat occurs on or near the site.

Alternatives Table 2
California Natural Diversity Database Records for Sensitive Species Within 5 Miles of the Mesquite Lake Alternative

Common Name / *Scientific Name*	Status State/Fed/CNPS/BLM	Occurrence Within 5 Miles of Agricultural Lands Alternative
Abrams' spurge *Chamaesyce abramsiana*	--/--/2.2/--	Occurs 5 miles north of the site.
Flat-tailed horned lizard *Phrynosoma mcallii*	SSC/--/--/BLMS	Occurs in 2 locations, 5 miles west and 5 miles north of site.
Yuma clapper rail *Rallus longirostris yumanensis*	ST/FE/--/--	Occurs 5 miles east of site.
Western yellow bat *Lasiurus xanthinus*	SSC/--/--/--	Occurs in 2 locations, 5 miles north and 2 miles south of site.
Burrowing Owl *Athene cunicularia*	SSC/--/--/BLMS	Occurs in 3 locations, 3 miles southwest of site.
Gila Woodpecker *Melanerps uropygialis*	SE/--/--/--	Occurs approximately 5 miles north of site.
Crissal thrasher *Toxostoma crissale*	SSC/--/--/--	Occurs approximately 5 miles north of site.

Source: SES 2009n.

STATUS CODES

Federal FE = Federally listed endangered: species in danger of extinction throughout a significant portion of its range
FT = Federally listed, threatened: species likely to become endangered within the foreseeable future
BCC: Fish and Wildlife Service: Birds of Conservation Concern: Identifies migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent highest conservation priorities <www.fws.gov/migratorybirds/reports/BCC2002.pdf>

State SE = State listed, endangered
ST = State listed as threatened
SSC = Species of special concern
WL = State watch list

California Native Plant Society
List 1B = Rare, threatened, or endangered in California and elsewhere
List 2 = Rare, threatened, or endangered in California but more common elsewhere
List 3 = Plants which need more information

List 4 = Limited distribution – a watch list
0.1 = Seriously threatened in California (high degree/immediacy of threat)
0.2 = Fairly threatened in California (moderate degree/immediacy of threat)
0.3 = Not very threatened in California (low degree/immediacy of threats or no current threats known)

BLM: Sensitive: Bureau of Land Management
BLM Manual § 6840 defines sensitive species as "…those species that are (1) under status review by the FWS/NMFS; or (2) whose numbers are declining so rapidly that federal listing may become necessary, or (3) with typically small and widely dispersed populations; or (4) those inhabiting ecological refugia or other specialized or unique habitats." <www.blm.gov/ca/pdfs/-pa_pdfs/biology_pdfs/SensitiveAnimals.pdf>

Following are descriptions of the sensitive species in the vicinity of this alternative site (SES, 2009n).

- **Flat-Tailed Horned Lizard (FTHL)** habitat includes windblown desert sand deposits within several vegetative associations. In California, the FTHL has been recorded in sandy flats and hills, badlands, salt flats and gravelly soils characterized by the Lower Colorado River Valley Subdivision of Sonoran Desert Scrub (CPUC 2008). Areas identified as especially important to the species in California encompass approximately 210,000 acres found in four regions with management areas (MA) established as the core areas for maintaining self-sustaining populations of the FTHL in perpetuity. Prescriptions that guide management within MAs are designed to reduce surface disturbance and to promote habitat reclamation.
- **Yuma clapper rail** habitat includes fresh-water marshes dominated by cattail or bulrush. Early successional marshes with little residual vegetation may be preferred. Most individuals do not migrate, but have minor seasonal changes in their activity areas. Juveniles do disperse to nearby habitats.
- **Western Yellow Bat** habitat includes wooded areas and desert scrub. Roosts in foliage, particularly in palm trees.
- **Burrowing owl** is a year-long resident of open, dry grassland and desert habitats. It is also found as a resident in grass, forb, and open shrub stages of pinyon-juniper and ponderosa pine habitats as well as agricultural lands. This small owl is found the length of the State of California in appropriate habitats and has been found at elevations as high as 5,300 ft in Lassen County. They are not found in the humid northwest coastal forests. Outside California, this bird is found in southwestern Canada, the western U.S., Florida, and northern Alaska (CPUC 2008). The burrowing owl is migratory over much of its range even in southern California.
- **Gila woodpecker** is a permanent Sonoran desert dweller found in southeast California, southwest Nevada, southern Arizona, southwest New Mexico and south into central Mexico.
- **Crissal thrasher** is an inhabitant of desert washes and riparian thickets of the American Southwest and central Mexico.
- **Abrams' spurge**, an annual herb, occurs in Mojave desert scrub and Sonoran desert scrub in sandy areas.

No sensitive species sightings occurred within the Mesquite Lake Alternative site. During the reconnaissance survey, access to this site was restricted to public roads, making it difficult to look for animal sign. Species observed on site include black phoebe (*Sayornis nigricans*), western meadowlark, and American kestrel (*Falco sparverius*). No sensitive species were documented on site during the biological reconnaissance, and no CNDDB records exist for the site. However, a single northern harrier (SSC) was

observed foraging over agricultural lands south of the site and is likely to use the alternative site as well. Although not considered a sensitive habitat, the agricultural fields on site support potential habitat for several sensitive animal species, including burrowing owl (moderate potential; SSC), California horned lark (moderate potential; SSC), and northern harrier (high potential), which may use the fields for foraging. The site is unlikely to support the flat-tailed horned lizard. Sensitive plants are unlikely to occur on site due to extensive disturbance from agriculture and development activities.

Environmental Impacts – Construction

Approximately 6,500 acres of active and fallow agricultural land would be permanently lost as a result of vegetation clearing, grading, and construction of the solar facilities, potentially affecting special status animal species such as the burrowing owl which uses agriculture lands for habitat. Impacts to listed or sensitive plant species would result from direct or indirect loss of known locations of individuals or direct loss of habitat. Indirect loss of individual plants may occur in instances such as sediments transported (e.g., from cleared areas during rain events) that cover adjacent plants or changes in a plant's environment that cause its loss (e.g., adjacent shrubs that provided necessary shade are removed). Additional impacts would occur due to the construction and operation of linear facilities associated with a solar facility at the Mesquite Lake Alternative, including a transmission line approximately 25 miles long.

Impacts/Mitigation to Wildlife. Building a solar facility at the Mesquite Lake Alternative site would primarily impact active and fallow agricultural lands. Impacting agricultural lands would potentially have an adverse effect on listed and sensitive wildlife species and their habitats either directly or through habitat modifications, especially on the burrowing owl which is known to use agricultural land for habitat. Any wildlife residing on this site would potentially be displaced, injured, or killed during project activities. Animal species in the project area could fall into construction trenches, be crushed by construction vehicles or equipment, or be harmed by project personnel. In addition, construction activities may attract predators or crush animal burrows or nests.

Burrowing Owl. The burrowing owl's numbers have been markedly reduced in California for at least the past 60 years. Conversion of grasslands, other habitat destruction, and poisoning of ground squirrels have contributed to the reduction in numbers in recent decades, which was noted in the 1940s, and earlier. Within the past 20 years, however, and particularly within the past five years, the decline of burrowing owls in California appears to have greatly accelerated. Apparently, this has resulted because of habitat loss caused by increased residential and commercial development (CPUC 2008). Although the CNDDB database does not show any record of the burrowing owl at the Mesquite Lake Alternative site, it has been observed nearby and could move onto the alternative site at any time. Burrowing owl survival can be adversely affected by human disturbance and foraging habitat loss, even when impacts to individual owls and burrows are avoided.

Migratory/Special Status Bird Species. Agriculture lands and fish ponds at the Mesquite Lake Alternative site provide foraging, cover, and/or breeding habitat for migratory birds, including special-status bird species that may be present at the site. Project construction and operation could impact nesting birds in violation of the

Migratory Bird Treaty Act. Preconstruction surveys and avoidance of nesting birds would reduce such impacts.

Spread of Noxious Weeds. Construction of a solar facility at the Mesquite Lake Alternative site could result in the introduction and dispersal of invasive or exotic weeds. The permanent and temporary earth disturbance adjacent to native habitats increases the potential for exotic, invasive plant species to establish and disperse into native plant communities, which leads to community and habitat degradation. A weed reduction program would potentially reduce and mitigate impacts.

Noise. Noise from construction activities could temporarily discourage wildlife from foraging and nesting immediately adjacent to the alternative site. Many bird species rely on vocalization during the breeding season to attract a mate within their territory. Noise levels from certain construction, operations, and demolition activities could reduce the reproductive success of nesting birds.

Operational Impacts

Operation of a 25-mile transmission line could result in increased avian mortality due to collision with new transmission lines. Mitigation could include installing the transmission line in accordance with the Avian Powerline Interaction Committee (APLIC) Guidelines designed to minimize avian-power line interactions.

Comparison to Proposed Project. Definite conclusions about the potential for significant adverse impacts of a 750 MW project on the Mesquite Lake Alternative site to biological resources cannot be made in the absence of site-specific surveys and project design information. Overall, development of a solar project at the Mesquite Lake Alternative site would likely impact fewer biological resources compared to those impacted by the proposed SES Solar Two project. The Mesquite Lake Alternative consists primarily of agricultural land, which is not a sensitive habitat. Rose Canal, its tributaries, and a few small areas of tamarisk scrub may be considered jurisdictional by the Corps and/or CDFG. The agricultural fields provide potential foraging habitat for the burrowing owl, California horned lark, and loggerhead shrike, but do not support habitat suitable for the flat-tailed horned lizard or Le Conte's thrasher. Due to the high level of land alteration and disturbance (i.e., continual tilling and grading), rare plant species are not expected to occur. This alternative has fewer biological constraints than the proposed SES Solar Two project site, since it is mainly agricultural land with some development (i.e., cemetery, sugar factory).

Cultural Resources

Environmental Setting. The Mesquite Lake Alternative site is located on a combination of agricultural land, undeveloped land, and disturbed, industrial land in Imperial County. The alternative site is located in the ancient Lake Cahuilla bed, formed when the Colorado River flowed north into the Salton Trough before shifting and flowing south to the Gulf of Mexico (Imperial County 2006). There appear to have been between three and five filling episodes of Lake Cahuilla between 100 B.C. and A.D. 1700 (Imperial County 2006). When full, this vast freshwater lake was over 100 miles long and about 35 miles wide. There are numerous recessional shorelines. These high levels and recessional shorelines, down to approximately 40 feet below sea level, contain large

numbers of archaeological sites (Imperial County 2006). Recessional shorelines at elevations below 40 feet below sea level have a much lower potential for archaeological materials. The large number of Late Prehistoric archaeological sites along Lake Cahuilla shorelines suggests that large groups of people harvested fish, waterfowl, and plant resources along its shorelines when the lake was full. Further details regarding Lake Cahuilla can be found in the **Cultural Resources** section of this SA/DEIS.

From a 1908 USGS topographic map, Mesquite Lake was known to exist as a relatively large ephemeral lake near the west side of the Alamo River about half-way between the current towns of Imperial and Brawley (Imperial County 2006). From an examination of the 1908 map, it would appear that Mesquite Lake was fed by two ephemeral streams leading from the Alamo River. Today, Mesquite Lake is most evidenced by a depression adjacent to Keystone Road in the northeast portion of the project area. Nearly the entire Mesquite Lake Special Plan Area has been utilized for agriculture in the past, although large areas have been left fallow for some time (Imperial County 2006).

Native American cultural history in the Mesquite Lake region is believed to date to 12,000 years ago, the period referred to as San Dieguito, distinguished by assemblages of varnished choppers, scrapers, and other core-based tools found on old desert pavement areas (Imperial County 2006). The materials suggest a mobile group focused on big game hunting (Imperial County 2006). From about 7,000 to 4,000 years ago there is an apparent shift to a more generalized economy and an increased emphasis on the exploitation of plant resources (Imperial County 2006). The refinement of tool types and milling equipment suggest a more effective adaptation to conditions in the greater southwest deserts (Imperial County 2006).

The Late Prehistoric period in the Colorado Desert begins approximately 1,500 years ago and is characterized by changes in economic and settlement systems. Along the Colorado River there was a shift from hunting and gathering to floodplain horticulture (Imperial County 2006). Culture traits generally associated with this period include increasingly elaborate kinship systems, rock art, and expanded trading networks (Imperial County 2006).

The Mesquite Lake region was settled by the Kamia, whose territory included the southern Imperial Valley from the southern half of the Salton Sea to well south of the United States/Mexico border (Imperial County 2006). The Kamia hunted, gathered, and used floodplain horticulture along the New and Alamo Rivers (Imperial County 2006). The Mesquite Lake Specific Plan Area includes the Kamia *Saxnuwai* settlement, which began at the general latitude of Brawley and continued south including the Mesquite Lake and French Lake regions (Imperial County 2006).

In the late 1800s, Imperial Valley's agricultural and water resource development began. Historical resources include roads, canals, drains, powerlines and the Niland-Calexico rail line (Southern Pacific Railroad). The majority of these historic resources have been continuously modified, maintained and improved (Imperial County 2006).

A cultural records search was conducted for the Mesquite Lake Specific Plan Master EIR which resulted in a total of two historic and two prehistoric sites that had been recorded within one mile of the study area (Imperial County 2006). A cultural research record

search was conducted in 2009 for the Mesquite Lake Alternative site which identified a total of 13 previously recorded cultural resources sites. This research search was limited to the data located within the boundaries of the Mesquite Lake Alternative site. Based on the two database searches, a total of 15 recorded resources were identified (SES 2009n; Imperial County 2006), as shown in **Alternatives Table 3**, including:

- 2 lithic scatters
- 3 temporary campsites
- 1 ceramic scatter
- 4 historic sites
- 2 cave sites
- 1 combination trail, lithic scatter, and sleeping circles
- 1 large temporary camp (site form missing from URS search)
- 1 ethnographic village site

Alternatives Table 3
Cultural Resources – Mesquite Lake Alternative Site

Resource	Description	Resource	Description
IMP-4678	Large temporary camp with 17 loci	IMP-1003	Lithic Site – Cores and flakes
IMP-670/831/370	Temporary camp	IMP-295	Ceramics – isolated ceramic scatter
IMP-301	Temporary campsite	IMP-8682 (P-13-008682)	Historic – Southern Pacific Railroad
IMP-87	Cave site	IMP-88	Cave site
IMP-2881	Lithic – Single artifact	IMP-1020	Historic – Irrigation canals
IMP-177	Trails, lithics, sleeping circles	IMP-301	Temporary campsite
IMP-441	Historic wagon road	IMP-1698	Ethnographic village site
IMP-5979H	Historic Imperial Cemetery		

Source: SES 2009n; Imperial County 2006.

Environmental Impacts. Fifteen known archaeological, architectural, or historical sites would potentially be affected by construction and operation of a solar facility at the Mesquite Lake Alternative site. Conditions of Certification such as those required for the SES Solar Two Project at Plaster City provided in the **Cultural Resources** section of this SA/DEIS may reduce this impact; however, specific site surveys would be required to be certain.

Currently unknown, unrecorded cultural resources may be found at the Mesquite Lake Alternative site associated with the lower elevation recessional shorelines of Lake Cahuilla. As they are discovered, resources would be recorded and information retrieved. If the nature of the resource requires it, the resource would be protected. When discovered, cultural resources would be treated in accordance with applicable federal and state laws and regulations as well as the mitigation measures and permit requirements applicable to a project. As with the SES Solar Two Plaster City location, resources discovered during construction of current and future projects would be subject to legal requirements designed to protect them. Areas within the Mesquite Lake Alternative site where intensive cultivation for agricultural use has occurred would have a low probability for the presence of significant cultural resources due to deep excavation for drainage tiles and recurring surface disturbance (Imperial County 2006).

Comparison to Proposed Project. Development of a solar project at the Mesquite Lake Alternative site would likely impact fewer cultural resources than at the SES Solar

Two project at Plaster City as a significant portion of the alternative site has been previously disturbed for agricultural and other purposes. As such, the Mesquite Lake Alternative is preferred to the proposed SES Solar Two site for impacts to cultural resources.

Hazardous Materials

Environmental Setting. The topography of the Mesquite Lake Alternative site is essentially flat, as are the immediately surrounding areas. One caretaker residence is located within the Mesquite Lake Alternative site, and other caretaker dwellings may be present (Imperial County 2006). Rural residences are located one mile north of the site, at Brawley. The Mesquite Lake Specific Plan does not allow residential uses other than caretakers or security personnel, nor does it allow schools or hospitals in the specific plan area. No schools, hospitals or other vulnerable land uses exist within a two-mile radius of the site (Imperial County 2006).

Access to the Mesquite Lake Alternative site would likely be via SR 86 from El Centro to the Keystone exit. Transport would likely turn east onto Keystone Road from SR 86 to arrive at the site; however, internal access roads would be required. The exit off of SR 86 has been improved and includes a turning lane onto Keystone Road reducing traffic conflicts.

Environmental Impacts. Hazardous materials use at the Mesquite Lake Alternative site, including the quantities handled during transportation and disposal, would be the same as those of the proposed SES Solar Two project. As stated in the **Hazardous Materials** section in this SA/DEIS, hazardous materials used during the construction phase of the SES Solar Two project would include gasoline, diesel fuel, motor oil, lubricants, and small amounts of solvents and paint. No acutely toxic hazardous materials would be used on site during construction, and none of these materials pose a significant potential for off-site impacts as a result of the quantities on site, their relative toxicity, their physical states, and/or their environmental mobility.

Hydrogen gas would be produced on site through electrolysis by one hydrogen generator. Hydrogen is identified as a hazardous substance based on its flammable characteristics. Although the project would not be subject to State or federal requirements for hydrogen storage, SES conducted an Offsite Consequence Analysis for the project and considered four worst-case scenarios. In the event of the worst case scenario induced from cumulative releases at the site, the maximum impacted distance is 0.13 mile (SES 2009q). Because the Mesquite Lake Alternative site would have at least one sensitive receptor in the specific plan area, the release of hydrogen could pose a significant impact. Conditions of Certification and compliance with applicable laws, ordinances, regulations, and standards (LORS) would reduce this impact to less than significant.

Transportation of hazardous materials to the Mesquite Lake Alternative site would require passing near residences located in El Centro and the City of Imperial. The transportation would be primarily on I-8, SR 86 or SR 111 and would avoid smaller roads with residences.

Comparison to Proposed Project. The hazardous materials used at the Mesquite Lake Alternative site would be the same as those used at the proposed SES Solar Two site and both the Mesquite Lake Alternative site and the proposed site have sensitive subgroups within a five-mile radius. With adoption of the proposed Conditions of Certification, the Mesquite Lake Alternative would comply with all applicable LORS and result in no significant impacts to the public.

Land Use

Environmental Setting. The Mesquite Lake Alternative site would be located on private agricultural and industrial land containing at least one residence and potentially other caretaker residences. The County General Plan designated an area of approximately 11.5 square miles extending between SR 86 on the west and SR 111 on the east, and bordered by Harris Road on the south and Carey Road on the north as the Mesquite Lake Specific Plan in 1993. Imperial County designated the site an area for new job-producing light, medium, and heavy industrial uses (Imperial County 2006). The county performed an environmental review of a portion of this special plan area in 2005, the Mesquite Lake Specific Plan Area. The Mesquite Lake Specific Plan Area is zoned Heavy Industrial, Medium Industrial, Light Industrial, Agriculture and Aquaculture, and Government/Special Public (Imperial County 2006).

Existing land uses at the Mesquite Lake Specific Plan Area include the Holly Sugar plant located in the northwest corner, the Imperial Valley Resource Recovery Co., LLC (operational) and the Mesquite Lake Cattle Manure Power Plant (non-operational) adjacent to SR 111. Proposed uses for the land include the Palo Verde Valley Recycling Center, NEAC Hay Compression, Liberty X Biofuels Power, and improvements to the existing Holly Sugar plant to become the Holly Sugar Imperial Bioresources facility.

Land uses on the Mesquite Lake Alternative site include approximately 1,420 acres of crop production and approximately 1,905 acres of fallow land as well as a fish farming operation located on approximately 640 acres in the eastern portion of the site. The northern portion of the fish farm does not appear to be operational. Approximately 347 acres of this land has been designated as Prime Farmland, 1,425 acres as Farmland of Statewide Importance, 213 acres as Unique Farmland, and 718 acres as Farmland of local importance by the California Department of Conservation (Imperial County 2006).

Approximately 1,600 acres of the Mesquite Lake Specific Plan Expansion Area are designated as Farmland of Statewide Importance. The Mesquite Lake Specific Plan Expansion zone is actively farmed. Additionally, while the transmission interconnection would follow existing ROW, it would be located on agricultural land and would permanently convert some agricultural land to non-agriculture uses.

The Union Pacific Railroad and IID Rose Canal cross the site from southwest to northeast.

Sensitive Land Uses. Approximately two households are located within 2,500 feet of this alternative site. No other sensitive receptors are located within 2,500 feet of the site. A number of sensitive receptors would be located within 2,500 feet of the transmission interconnection because it would follow existing IID ROW which traverses several residential communities on West Aten Road on the southern side of the City of Imperial.

Transmission Interconnection. As stated above, the Mesquite Lake Alternative site would require approximately 25 miles of new 230 kV transmission line to reach the Imperial Valley Substation. The transmission line would follow the existing IID 92 kV ROW until the intersection of Dogwood Road and East Villa Road. The transmission interconnection would then parallel the existing IID 230 kV ROW southwest from this intersection until reaching the Imperial Valley Substation. The route would cross approximately 0.4 mile of BLM land before entering the substation from the north. This land is within the area covered by the CDCA Plan. The Energy Production and Utility Corridor Element of the CDCA Plan established a network of joint-use planning corridors intended to meet the projected utility service needs at the time the Plan was written. The transmission line would be developed on BLM land within the CDCA planning area designated utility corridor N; therefore a Plan Amendment would not be required for this transmission line.

Environmental Impacts. The Mesquite Lake Alternative site is within areas of the Mesquite Lake Specific Plan and Specific Plan Expansion zone. The Mesquite Lake Specific Plan identifies renewable electric generation facilities (primarily biomass, biogas, and geothermal) as a permitted use with a Conditional Use Permit after CEQA requirements are met. In addition, the existing Geothermal Overlay Zone is retained on the specific plan area which permits the development of geothermal resources for the production of energy or other geothermal products by conditional use permit in accordance with Division 17 of the Imperial County Land Use Ordinance.

Use of the entire Mesquite Lake Specific Plan Area and Future Expansion area for the SES Solar Two power plant would prevent any other potential uses of this area. The Mesquite Lake Specific Plan identifies beneficial uses of the land including government facilities and special public zones, heavy manufacturing, storage and distribution, transportation facilities such as heliports and railroad spurs/ yards, communication and public utilities, semi-public and institutional uses such as water and sewage treatment facilities and flood control facilities. Imperial County anticipated that the Mesquite Lake Specific Plan Area would result in new job creation in employment sectors such as manufacturing, fabrication, processing, wholesale and others. If the land were used for the SES Solar Two power plant, no other use would be viable**.**

The construction and operation of a 750 MW Solar Two project at the Mesquite Lake Alternative site would result in the removal of up to 3,660 acres of farmed and fallow agricultural land and the permanent conversion of approximately 6,500 acres of farmland to renewable energy production. The construction and operation of the solar power plant would eliminate existing agricultural operations and foreseeable future agricultural use. However, this loss of agricultural lands is likely to be a less than significant impact because the County has determined, since the 1970s, that the project area's highest and best use would be for medium and heavy industrial uses that would provide for more diversified employment opportunities and has rezoned the land for industrial use (Imperial County 2006). According to the Mesquite Lake Specific Plan Master EIR, the conversion of the project site to industrial uses would result in a minor reduction in countywide lands designated as important farmlands. However, in conjunction with other planned projects in the vicinity, particularly those in the Cities of Imperial and Brawley, as well as future anticipated development of each city's Urban

Area, the proposed project, would cumulatively reduce the amount of land designated in the farmland categories and would also cumulatively reduce the area of farmed land.

The Mesquite Lake Alternative site has at least one caretaker residence. However, because the Mesquite Lake Alternative design would avoid impacting the existing infrastructure on the land this residence would be avoided.

The nearest group of residences is the City of Imperial approximately one mile south of the Mesquite Lake Alternative site. Other rural residences, primarily farm houses are located within one mile of the site. Construction activities for the alternative would create temporary disturbance at these residential areas (i.e., heavy construction equipment on temporary and permanent access roads and moving building materials to and from construction staging areas). Conditions of Certification to reduce noise and air quality impacts are presented in the Noise and Air Quality sections of this SA/EIS for the proposed SES Solar Two project. Because this disturbance would be temporary at any one location and because of the distance between the Mesquite Lake Alternative site and the residential uses, the impacts would likely be less than significant.

Comparison to Proposed Project. The Mesquite Lake Alternative site would eliminate use of BLM land, and eliminate the need for a CDCA Plan amendment. The Mesquite Lake Alternative site would remove agricultural land from productivity, including Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of local importance. However, according to the Imperial County Mesquite Lake Specific Plan Master EIR, conversion of the farmland to primarily industrial uses is consistent with the specific plan area designation of the County General Plan (1993) which acknowledges that the project site is “predominantly affected by soils that are high alkaline which reduces agriculture production.” Because of the soil alkalinity and because the specific plan area has been designated for industrial use, the impact caused by the conversion of agricultural land at the Mesquite Lake Alternative site would be reduced in severity.

Recreation and Wilderness

Environmental Setting. The Mesquite Lake Alternative site would be located on primarily agricultural land that is zoned Heavy, Medium, and Light Industrial and Agriculture and Aquaculture. No recreational land is located on or adjacent to the Mesquite alternative site. The nearest parks are located in the City of Imperial, approximately one mile south of the Mesquite Lake Alternative site. The only recreational use in the region is the periodic flooding of fallow farmlands during the duck hunting season for use by hunting clubs (Imperial County 2006).

Environmental Impacts. Due to the distance between the Mesquite Lake Alternative site and the nearest recreational facility or wilderness, no impacts to these resources would occur at this site. While conversion of the property from fallow farmland to industrial uses would preclude flooding properties during duck hunting season for duck hunting, numerous other sites suitable for duck hunting occur throughout Imperial County and are actively used.

Comparison to Proposed Project. No recreational lands are located adjacent to the Mesquite Lake Alternative site. The SES Solar Two project site is characterized by diverse recreational opportunities on BLM lands, including areas for off-road vehicle (ORV)

use, camping and backpacking. As such, recreational impacts at the proposed Plaster City site would be greater than at the Mesquite Lake Alternative site.

Noise and Vibration

Environmental Setting. The Mesquite Lake Alternative site and its associated 230 kV transmission line would be located on private farmed and fallow agricultural lands. Low noise levels under 50 dBA generally currently occur on these agricultural lands. Holly Sugar Imperial Bioresources, located at the northwest corner of the Mesquite Lake Alternative site, increases the ambient noise levels due to the sugar plant and biomass facility operations. Existing noise levels have not been measured near the plant because the area is unpopulated. Noise levels would be elevated along the western and eastern boundaries of the Mesquite Lake Alternative site due to the presence of SR 86 and SR 111 and existing industries near that part of the site.

Nearby sensitive receptors include the caretaker's residence on the project site and potentially other nearby caretaker residences.

Environmental Impacts. As discussed in the **Noise** section of this SA/DEIS, the construction of the SES Solar Two plant would create noise, or unwanted sound. The character and loudness of this noise, the times of day or night at which it is produced, and the proximity of the facility to sensitive receptors combine to determine whether the facility would meet applicable noise control laws and ordinances and whether it would cause significant adverse environmental impacts.

The Mesquite Lake Specific Plan does not propose residential uses. Only a few single family residences exist within or adjacent to the project site that could be potentially affected by noise at the Mesquite Lake Specific Plan Area (Imperial County). Imperial County designated the Mesquite Lake area as industrial in part because it would avoid potential nuisance conflicts such as noise impacts to sensitive receptors.

Comparison to Proposed Project. Building the SES Solar Two project at the Plaster City site or the 750 MW project at the Mesquite Lake Alternative site would not create noise impacts.

Public Health and Safety

Environmental Setting. As with the SES Solar Two site, the Mesquite Lake Alternative site is located in an isolated area. The nearest city, City of Imperial, is located approximately one mile south of the southwest corner of the Mesquite Lake Alternative site. Scattered rural residences occur within one mile of the Mesquite Lake Alternative. The Mesquite Lake Alternative is zoned for industrial use.

Environmental Impacts. While the meteorological conditions and topography at the site are not exactly the same as at the applicant's proposed site, they are similar, and the results of air dispersion modeling and a human health risk assessment for the Mesquite Lake Alternative site would be similar to that of the proposed site. The cancer risk and hazard indices are much below the level of significance at the point of maximum impact, so the project would be unlikely to pose a significant risk to public health at the Mesquite Lake Alternative site. See the **Public Health and Safety** section

of the SA/DEIS for details of the cancer risk and hazard indices study for the SES Solar Two project.

Comparison to Proposed Project. There is no significant difference between this location and the proposed site for public health.

Socioeconomics and Environmental Justice

Environmental Setting. Like the proposed SES Solar Two site, the Mesquite Lake Alternative site is located in Imperial County. The demographic characteristics of Imperial County are described in the **Socioeconomics and Environmental Justice** section of the SA/DEIS.

Environmental Impacts. Because of the limited population in the Cities of Imperial and Brawley, construction workers would most likely be from larger nearby cities such as El Centro and San Diego. While there is limited housing in the Cities of Imperial and Brawley, workers could commute from El Centro, approximately eight miles south of the Mesquite Lake Alternative site. An option would be to construct temporary housing in the immediate area of the Mesquite Lake Alternative site; however, this would increase the construction impacts and require provision of additional services such as electricity, water, waste removal, and food. Because it is unlikely that the construction workers would relocate to the City of Imperial or Brawley, the Mesquite Lake Alternative would not cause a significant adverse socioeconomic impact on the area's housing, schools, police, emergency services, hospitals, and utilities.

The Imperial County Sheriff's Department commented on the Mesquite Lake Specific Plan Master EIR and stated that the development of the Mesquite Lake Specific Plan area would potentially impact the Sheriff's Office due to calls for service during construction and operation of the Specific Plan land uses. Use of this site for a 750 MW project may require mitigation that would provide for fees to offset the cost of providing additional deputies for this service. The inclusion of mitigation fees would reduce this impact to less than significant.

There would be no adverse socioeconomic impacts because most of the construction and operation workforce is within the regional labor market area, and construction activities would be short-term. Benefits from the 750 MW SES Solar Two project, should it be built at the Mesquite Lake Alternative site, are likely to be similar to the benefits from the SES Solar Two project in the Plaster City region. These include increases in sales taxes, employment, and income for Imperial County. Increased job creation would be consistent with the Imperial County specific plan for Mesquite Lake, which included establishment of an area for new job-producing light, medium, and heavy industrial uses.

Comparison to Proposed Project. The socioeconomic impacts of the 750 MW SES Solar Two project at the Mesquite Lake Alternative site would be similar to building and operating the SES Solar Two project at the proposed site.

Soil and Water Resources

Environmental Setting. Soils in the Mesquite Lake Alternative site are primarily Imperial Silty Clay, Imperial-Glenbar Loams, with a small amount of Holtville Silty Clay, Indio Loam, Meloland Very Fine Sandy Loam, and Vint and Indio very fine sandy loams

(USDA 2009). Some of these soil types are considered Prime Farmland and Farmland of Statewide Importance when irrigated. However, much of this area also contains alkaline soils.

The Mesquite Lake Alternative site lies within the Imperial Subregion of the Colorado River Basin Region 7. The site lies between the New and Alamo Rivers which are the major local flows into the Salton Sea.

Imperial Valley's agriculture drainage system provides over 1,450 miles of surface drains that discharge directly into the Alamo and New Rivers, and the Salton Sea. One of these canals, the Rose Canal, runs through the site from south to north. The Imperial Valley portion of the Colorado River Basin region faces several water quality issues, including increasing salinity, selenium, and eutrophication in the Salton Sea; and silt, nutrient, and pesticide pollution caused by the agricultural drains (Imperial County 2006).

There are no major watercourses on the site. The site area is flat with some minor drainage ways and sinks on the property. Existing drainage systems in the project area are designed to carry irrigation runoff to the Alamo River via Imperial Irrigation District drains, primarily utilizing the Rose Outlet. Evaporation ponds exist for the Holly Sugar plant operations (Imperial County, 2006). The area is classified by FEMA as Zone X, meaning the area is outside the 500-year floodplain. Some local minor flooding could occur in the area due to the flat terrain. The Mesquite Lake Specific Plan Area contains a depressed "sink" area adjacent to Keystone Road which retains water during rainstorms and can make Keystone Road impassible (Imperial County 2006).

The Mesquite Lake site lies above the Imperial Valley Groundwater Basin described in the setting for the proposed project.

Water can be provided to the site by the Imperial Irrigation District from the Colorado River via the All-American Canal, which imports water by gravity flow at an annual rate of approximately 3.1 million acre-feet. The project area is served from the Rose Canal.

The project is not within the service area of any water treatment plant, the nearest being the City of Imperial plant approximately three miles to the southwest. Raw water from IID can also be used for many industrial processes. Each 160-acre quarter section of land in the Imperial Valley includes the right to use up to 326,000 gallon per day of Colorado River water (Imperial County, 2006).

Environmental Impacts

Soil Erosion Potential by Wind and Water. As discussed in the **Soils and Water** section of this SA/DEIS, construction activities can lead to adverse impacts to soil resources including increased soil erosion, soil compaction, loss of soil productivity, and disturbance of soils crucial for supporting vegetation and water-dependent 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 loading to nearby receiving waters. Although access to the site would be from existing roads, construction of the solar dish array would require a substantial construction of local access roads as in the proposed project. While the volume of earth movement

required at the alternative site is unknown, the topography and slope of the Mesquite Lake Alternative site are less severe than at the proposed SES Solar Two site.

The Mesquite Lake Alternative site is not crossed by desert washes as is the proposed site, and would not have the erosion-related impacts related to placement of SunCatcher arrays within drainage ways as described for the proposed project. Soil erosion impacts would be relatively minor and likely mitigated by the Storm Water Pollution Prevention Plan (SWPPP), and Drainage Erosion and Sediment Control Plan (DESCP) that would be required. Due to the flat terrain and existing disturbed condition of this site, the SWPPP and DESCP would likely be sufficient to mitigate soil erosion impacts to a level less than significant.

Water Supply. The specific source of water supply for the Mesquite Lake Alternative site is unknown. The most likely source would be water supplied by the Imperial Irrigation District via the Rose Canal, which crosses the alternative site. Water rights of 326,000 gpd for each 160 acres would be more than sufficient to supply the project with water for mirror washing and dust control. Potable water would be from the same source as for the proposed project.

Wastewater/Storm Water Quality. Storm water runoff from the site during construction and operation could have similar impacts as proposed for the proposed project. The site construction will require a SWPPP which will specify Best Management Practices (BMPs) to minimize or eliminate water contamination. Water quality impacts would likely not be significant.

Sanitary waste disposal could be through existing wastewater infrastructure, or through on-site facilities as for the proposed project. No significant adverse impact is anticipated.

Comparison to Proposed Project. The level, disturbed terrain lacking in existing drainage ways on the Mesquite Lake site, results in a lesser Hydrology, Water Use and Water Quality impact for the Mesquite Lake Alternative than for the proposed project in the area of soil erosion and stream morphology. This alternative would avoid the significant impact identified for the proposed project in this regard. Water supply to the Mesquite Lake Alternative would most likely be from the IID Rose Canal.

Traffic and Transportation

Environmental Setting. The Mesquite Lake Alternative site is east of SR 86 and west of SR 111. SR 86 and SR 111 are four-lane divided highways that provide at-grade connections to Harris Road and Keystone Road. The Keystone Road intersections at SR 86 and SR 111 are signalized; the other State highway intersections are stop sign controlled for access from the local roads. Dogwood Road crosses the site from north to south. SR 111 provides a direct connection to the International Border Crossing at Calexico, California, and Mexicali, Baja California, approximately 15 miles south of the project site. All roads in the project area currently operate at a level of service C or better (Imperial County, 2006).

Transportation facilities serving the project area include the Countywide Transit System, Union Pacific Railroad, the Imperial County Airport and Brawley Municipal Airport. Daily service on the Countywide Transit System is provided along SR 86 and SR 111 between

El Centro and Brawley. The Union Pacific Railroad line passes through Mesquite Lake Alternative site and provides a through freight link between Arizona and points east, and to Los Angeles and points north. SR 86 is designated as a bicycle route in the Imperial County Bicycle Master Plan (Imperial County 2006).

Workers employed to construct the project at this alternative site would most likely commute from El Centro (eight miles).

Environmental Impacts. During the 40-month construction period, approximately 731 workers would commute to the site on a daily basis in addition to an estimated 274 truck trips daily. The worst case scenario estimates a total of 1,736 peak car and truck trips per day (SES 2008a). Before construction could occur at the Mesquite Lake Alternative site, a construction traffic control and transportation demand implementation program would need to be developed in coordination with Caltrans. This analysis may result in the need to limit construction-period truck and commute traffic to off-peak periods to avoid or reduce traffic and transportation impacts.

According to Caltrans (Imperial County 2006), extensive improvements to both SR 86 and SR 111 would be required to accommodate the increased use of the Harris Road and Keystone Road. However, a turning lane has been recently constructed at the intersection of SR 86 and Keystone Road. Caltrans may also require that the intersections continue to operate at a LOS C or better and any increase in delay at these intersections from project-related traffic would need to be analyzed (Imperial County 2006). Funding for the necessary improvements of SR 86 and SR 111 other than developer-installed improvements and impacts fees have not been identified by Imperial County and as such, the impacts would not be fully mitigated until funding were established to accommodate the improvements (Imperial County 2006).

The project would potentially impact the Union Pacific right-of-way because it would be located adjacent to an active railroad. Impacts to rail operations would be less than significant based on proper coordination with local agencies and the railroad operator. This rail line could also potentially be used to transport materials required for the project.

Glare. Similar to the proposed project, there is the potential for highly distracting diffuse glare from the project to affect nearby motorists. Existing uses at the site along both SR 86 (Holly Sugar Plant) and SR 111 (Mesquite Lake Recovery Facility and Imperial Resource Recovery Plant) would offer some physical screening for motorists. Staff developed **CONDITION OF CERTIFICATION VIS-6**, which requires mitigation in the form of physical screening (berms, fencing, landscaping, or similar means) along the length of the project adjacent to Interstate 8. That measure would be adapted to this alternative and would apply to adjacent roadways.

Comparison to Proposed Project. Impacts to traffic and transportation at the Mesquite Lake Alternative site would likely be greater than those at the proposed SES Solar Two site. Construction of the Mesquite Lake Alternative site would require improvements to both SR 86 and SR 111 to avoid impacting the LOS on these highways and without mitigation would likely cause a greater impact to traffic than the project at the Plaster City site.

Transmission Line Safety and Nuisance

Environmental Setting. The Mesquite Lake Alternative site would require approximately 25 miles of a new 230 kV transmission interconnection, compared to 10.3 miles required at the proposed project site. An existing IID 92 kV line crosses the Mesquite Lake site heading south. An additional 230 kV IID transmission line ROW could be followed from the intersection of Dogwood Road and West Aten Road until reaching the Imperial Valley Substation. This 230 kV ROW would require crossing the southern boundary of the City of Imperial within 500 feet of several residential neighborhoods located on West Aten Road.

Environmental Impacts. Similar to the proposed project, this alternative would be unlikely to cause transmission line safety hazards or nuisances with implementation of Conditions of Certification Such as those described in the **Transmission Line Safety and Nuisance** section of the SA/DEIS. The potential for nuisance shocks would be minimized through grounding and other field-reducing measures that would be implemented in keeping with current standard industry practices, and the potential for hazardous shocks would be minimized through compliance with the height and clearance requirements of CPUC's General Order 95. Compliance with Title 14, California Code of Regulations, Section 1250, would minimize fire hazards, while the use of low-corona line design, together with appropriate corona-minimizing construction practices, would minimize the potential for corona noise and its related interference with radio-frequency communication in the area around the route.

The public health effects of any related field exposures cannot be characterized with certainty. The only conclusion to be reached with certainty is that the proposed lines' design and operational plan would be adequate to ensure that the generated electric and magnetic fields are managed to an extent the CPUC considers appropriate.

Comparison to Proposed Project. The Mesquite Lake Alternative site would require a longer transmission line interconnection with the SDG&E transmission system. While the electric and magnetic fields would be managed to an extent the CPUC considers appropriate, the transmission line would be located near a number of residential neighborhoods along West Aten Road. Because the transmission interconnection for the proposed site would not be located within 500 feet of any residential properties, the potential impact associated with transmission lines would be greater for the Mesquite Lake Alternative than for the proposed site.

Visual Resources

Environmental Setting. The Imperial Valley is a flat, low-lying desert area primarily covered with a patchwork of irrigated farmland in the vicinity of the Mesquite Lake Alternative. A series of open canals extend across the valley both north-south and east-west. The New River, approximately two miles west of the Mesquite Lake Specific Plan Area, meanders toward the northeast and drains into the Salton Sea. The City of Brawley lies about three miles north of the Mesquite Lake Alternative, and the Cities of Imperial and El Centro are located approximately one and five miles south of the alternative, respectively. Much of the development in the vicinity of the Mesquite Lake Alternative site is confined to these three cities.

There is one known residence within the alternative site and one south of the site on Dogwood Road. Other scattered residences would have views of the facility site from the north and west. Viewer concern, as defined in the **Visual Resources** section of the SA/DEIS, of the project should it be developed at the Mesquite Lake Alternative site would be moderate. The number of residential viewers represented in this view is low, and their focus on scenic values in this agriculture- and industrially-oriented context is considered moderately low. There are no parks or recreation areas in the immediate area. Several mountain ranges border the valley, particularly to the south and northeast, but these hills are relatively far away and provide a generally hazy, low, and uneven view horizon.

Much of the Mesquite Lake Alternative site is currently occupied by farmland or farm-related auxiliary structures. The principal buildings at the site are associated with heavy industrial use. Silos at the Holly Sugar plant can be seen from surrounding areas. The factory site has a large mound of lime, used to process the sugar beets and sugar cane, southeast of the main facility that appears as a white mesa. Other buildings and sheds are scattered throughout the specific plan site including those associated with the existing Mesquite Lake Cattle Manure Power Plant, which is currently inactive, and the Liberty X Biofuels plant. These structures are functional and have an industrial look. A screened chain link fence and a masonry wall partially block views of the power plants.

Environmental Impacts. As discussed in the Visual Resource section in this SA/DEIS, the Energy Commission staff, in coordination with BLM, applied the BLM Visual Resource Management (VRM) system of visual assessment to the proposed SES Solar Two site at Plaster City. These delineated areas were then assigned a VR Class (from I through IV). VR Classes are analogous to Overall Sensitivity ratings under the Energy Commission method and are used to determine an area's visual objective, that is, the level of project-caused contrast that is acceptable, above which contrast could constitute a potentially significant adverse impact.

For the Mesquite Lake Alternative site, a visual impact analysis would be based on a comparison of the area's visual sensitivity with the industrial features added by the solar project. With the addition of a 750 MW project, views of the rural landscape would be increasingly industrial. Views would be dominated by roughly ten square miles of engine mirror-arrays, graded areas, and retention ponds, as well as light rays reflected off ambient atmospheric dust. There would be no natural features to block the view of the solar facilities on any side of the site, although other industrial facilities on the site like the Holly Sugar plant would block some of the views.

The site would be prominently visible from SR 86 and SR 111, for both northbound and southbound traffic. Travelers would see the site from a distance and there is little elevation or natural contouring that would block the solar facilities on the alternative site. According to the Mesquite Lake Specific Plan Master EIR, the visual experience of motorists on SR 86 and SR 111 is generally consistent throughout the project area, with no unique topographic features, and a utilitarian function and design to the few existing structures in the area. Views of the project would be short term and the viewer expectation of motorists driving through the area is generally low due to the disturbed nature of the area (Imperial County 2006).

The linear facilities associated with the Mesquite Lake Alternative site would include a 230 kV transmission line approximately 25 miles long. The transmission line would follow existing utility corridors and would roughly parallel existing IID transmission lines until reaching the Imperial Valley Substation. By following existing rights-of-way, the impact of a new transmission line would be minimized, as seen by travelers along SR 86 and SR 111. However, because the transmission line would follow West Aten Road and traverse a number of residential neighborhoods, a large number of residences would view the transmission line.

Comparison to Proposed Project. The Mesquite Lake Alternative site is preferred over the proposed SES Solar Two site for visual resources, because fewer viewers would see the solar facility at this alternative site and because the visual concern at the Mesquite Lake Alternative site would be lower than at the proposed site. Existing industrial and agricultural facilities at the site would reduce the visual contrast of the solar project at the Mesquite Lake Alternative site. As a result, a large solar project on the SES Solar Two area would create a more dramatic change to the visual environment than would occur at the Mesquite Lake Alternative site.

The interconnection transmission line at the Mesquite Lake Alternative site would be longer than at the proposed Plaster City site, but both interconnections would be located adjacent to existing line(s) in existing corridors. However, the Mesquite Lake Alternative transmission line would traverse residential neighborhoods along West Aten Road. As such, a greater number of visual receptors would be subject to increased industrial views and the visual impact of the transmission line would be greater at the Mesquite Lake Alternative site.

Waste Management

Environmental Setting. A leaking underground fuel tank is located approximately one mile north of the alternative site (Envirostor 2010). Additionally, a Federal Superfund Site is located east of Dogwood Road approximately half way between Keystone and Harris Roads. The 0.6-acre contamination site underwent a preliminary assessment by the EPA and has not been placed on the National Priorities List (Envirostor 2010). The potential contaminants of concern include pesticides from rinse water and from wastes from production (Envirostor 2010).

As discussed in the Waste Management section of this SA/DEIS, hazardous (estimated at 2 cubic yards per week) and nonhazardous (estimated at 80 cubic yards per week) solid and liquid wastes, including wastewater, would be generated at the SES Solar Two project site during construction and operation of the solar power plant. Waste would be recycled where practical and nonrecyclable waste would be deposited in a Class III landfill. The nearest waste disposal facilities that could potentially accept the nonhazardous construction and operation wastes generated by the project are the Imperial Solid Waste Site and the Allied Imperial Landfill in Imperial, California. The remaining capacity for the disposal facilities are 184,000 cubic yards and 2.1 million cubic yards respectively. Additional disposal facilities are located in proximity to the Mesquite Lake Alternative site.

The hazardous waste generated during project construction could include waste paint, spent construction solvents, waste cleaners, waste oil, oily rags, waste batteries, and

spent welding materials. (SES 2008a). The two Class I landfills that accept hazardous wastes in California are the Clean Harbor Landfill (Buttonwillow) in Kern County and the Chemical Waste Management Landfill (Kettleman Hills) in Kings County (SES 2008a). The Kettleman Hills facility also accepts Class II and Class III wastes. In total, there is in excess of 11 million cubic yards of remaining hazardous waste disposal capacity at these landfills, with approximately 30 years of remaining operating lifetimes (SES 2008a).

Environmental Impacts. Construction at the Mesquite Lake Alternative site would require excavation of fill material that underlies the site similar to that of the proposed project. Both nonhazardous and hazardous wastes would be created by the construction of the 750 MW Solar Two project at the Mesquite Lake Alternative site in similar quantities as at the proposed site and would be disposed of at appropriate facilities. The applicant would be required to obtain a unique hazardous waste generator identification number for the site prior to starting construction and would be required to comply with Conditions of Certification similar to those identified for the proposed site. The project at either the SES Solar Two or Mesquite Lake Alternative sites would produce minimal maintenance and plant wastes.

All nonhazardous wastes would be recycled to the extent possible, and nonrecyclable wastes would be regularly transported off site to a local solid waste disposal facility. Generation plant wastes include oily rags, broken and rusted metal and machine parts, defective or broken electrical materials, empty containers, and other miscellaneous solid wastes, including the typical refuse generated by workers. All construction and operation activities would need to be conducted in compliance with regulations pertaining to the appropriate management of wastes. The total amount of nonhazardous waste generated from the project is estimated to be 80 cubic yards of solid waste per week from construction, and approximately 10 cubic yards per week from operation. The disposal of the solid wastes generated by the SES Solar Two facility can occur without significantly impacting the capacity or remaining life of any of the probable disposal facilities that would be used.

Like nonhazardous wastes, hazardous wastes would be recycled to the extent possible. The 2 cubic yards per week of hazardous waste from the SES Solar Two site requiring off-site disposal would be far less than staff's threshold of significance and would therefore not significantly impact the capacity or remaining life of the Class I waste facilities. Similar to the proposed SES Solar Two project, the 750 MW project at the Mesquite Lake Alternative site would need to implement a comprehensive program to manage hazardous wastes and obtain a hazardous waste generator identification number (required by law for any generator of hazardous wastes).

Comparison to Proposed Project. The environmental impacts of waste disposal at the Mesquite Lake Alternative site would be similar to those at the proposed SES Solar Two site at Plaster City. However, the Mesquite Lake Alternative site would be closer to the Imperial Solid Waste Site and the Allied Imperial Landfill than the proposed site.

Worker Safety and Fire Protection

Environmental Setting. The Mesquite Lake Alternative site would be located within an area that is currently primarily agricultural. The area is currently served by the Imperial County Fire Department located at the airport in the City of Imperial, approximately two

miles south of the site. Mutual aid service for police and fire emergencies is available from Brawley and El Centro. The Worker Safety and Fire Protection section in this SA/EIR provides more information regarding the Imperial County Fire Department. The fire risks of this alternative site would be similar to those of the proposed Plaster City site as both have desert conditions and both sites are adjacent to heavily used transportation corridors.

Environmental Impacts. A solar plant at the Mesquite Lake Alternative site would require a Project Demolition and Construction Injury and Illness Prevention Program and a Project Operations Safety and Health Program in order to ensure adequate levels of industrial safety. The applicant would also be required to provide safety and health programs for project construction, operation, and maintenance, similar to the requirements for the proposed project site. The Imperial County Fire Department would be contacted to assure that the level of staffing, equipment, and response time for fire services and emergency medical services are adequate.

Comparison to Proposed Project. The environmental impact of worker safety and fire protection at the Mesquite Lake Alternative site would be similar to that at the proposed Plaster City site.

Engineering Assessment for Mesquite Lake Alternative

Facility Design

The design of a 750 MW project at the Mesquite Lake Alternative would be similar to that of SES Solar Two at the proposed project Plaster City site. The project design at the Mesquite Lake Alternative site would have to avoid some existing structures and proposed projects; however, it would not be constrained by the desert washes like the Plaster City site. Staff-recommended measures may be appropriate to ensure compliance with engineering laws, ordinances, regulations, and standards applicable to the design and construction of the project.

Geology, Paleontology and Minerals

Environmental Setting. The Cahuilla Lake Beds underlie the Mesquite Lake Alternative. The Cahuilla Lake Beds are generally composed of thinly bedded, poorly sorted, fine-grained, light grayish-brown fluvial sediments intervening with a lacustrine sequence of tan and gray fossiliferous clay, silt, sand, and gravel. These sediments are widespread and were deposited during the last seven high stands of the ancient Lake Cahuilla, believed to have existed intermittently from 270 years ago to at least 6,000 years ago. Fossil remains discovered in the Cahuilla Lake Beds include freshwater diatoms, sponges, terrestrial plants, mollusks, fish, ostracodes, and small terrestrial vertebrates. The Cahuilla Lake Beds are determined to have a high potential for paleontological resources (CPUC 2008b).

The Imperial Fault passes through Mesquite Lake, generally on a north-south alignment. In accordance with the Alquist-Priolo Earthquake Fault Zoning Act (Chapter 7.5 of Division 2, California Public Resources Code), the Office of the State Geologist has delineated Special Study Zones, which encompass potentially and recently active traces of major faults, including the Imperial Fault (Imperial County 2006).

The Imperial Valley, including the Mesquite Lake region, experiences natural subsidence at a rate of nearly two inches per year at the center of the Salton Sea and decreasing toward zero near the United States/Mexico border (Imperial County 2006). This includes gradual, local settling of the earth's surface with little or no horizontal motion. It is generally uniform but local depressions have formed such as the Mesquite Sink (Imperial County 2006).

The Salton Trough is an area underlain with geothermal water of sufficient temperature to be suitable for electrical generation. The Mesquite Lake Specific Plan Area is included in the South Brawley Known Geothermal Resource Area, encompassing approximately 12,640 acres (Imperial County 2006).

There are no known mineral resources at the site.

Environmental Impacts. Seismic ground shaking is probable at the alternative site because the Imperial Fault crosses that site. The severity and frequency of ground shaking associated with earthquake activity at the Mesquite Lake Alternative site is higher than at the proposed Plaster City site. As such, more stringent design criteria may be required for the Mesquite Lake Alternative in accordance with a design-level geotechnical report and California Building Code (2007) standards. Adequate design parameters for the facility would need to be determined through a site-specific evaluation by a Certified Engineering Geologist or Geotechnical Engineer. Impacts due to seismic hazards and soil conditions, such as subsidence, would be addressed by compliance with the requirements and design standards of the California Building Code. The potential for liquefaction exists in Imperial County in areas where relatively loose, sandy soils exist with high groundwater levels during long duration, high seismic ground shaking. There is potential for liquefaction along the Mesquite Lake Specific Plan Area due to the occasional flooding of this region.

The paleontological sensitivity and potential to encounter significant paleontological resources in Lake Cahuilla Beds at the alternative site is similar to that of the proposed SES Solar Two site. Construction of the proposed project will include grading, foundation excavation, utility trenching, and possibly drilled shafts. There exists the probability of encountering paleontological resources. As with the Plaster City site, the proposed Conditions of Certification are designed to substantially mitigate paleontological resource impacts at either site.

Comparison to Proposed Project. The Mesquite Lake Alternative site is subject to a greater risk of geologic hazards because of the stronger ground shaking and potential for liquefaction. In addition, this area experiences subsidence and potential flooding. Strong ground shaking could be effectively mitigated through facility design. The potential to encounter geologic resources and significant paleontological resources at the alternative site is similar to the Plaster City site. The Conditions of Certification provided in the Geology, Paleontology and Minerals section in this SA/DEIS would be applicable to the Mesquite Lake Alternative site.

Power Plant Efficiency

The plant configuration and Stirling Engine technology that would be employed at the Mesquite Lake Alternative would be similar to the proposed SES Solar Two project,

which means it would result in similar consumption of fuel, and it would result in a similar level of efficiency.

Power Plant Reliability

The plant configuration at the Mesquite Lake Alternative site would be similar to the proposed SES Solar Two project, which means it would result in similar levels of equipment availability. Plant maintainability, fuel and water availability, and reliability of the plant in relation to natural hazards would each be similar at the Mesquite Lake Alternative site to the proposed project.

Transmission System Engineering

As with the SES Solar Two site, the Mesquite Lake Alternative would interconnect with the Imperial Valley Substation through a new 230 kV transmission line dedicated to this project. As such, the transmission system evaluation for the Mesquite Lake Alternative site would be similar to that of the SES Solar Two project at the Plaster City site.

Summary of Impacts – Mesquite Lake Alternative

The Mesquite Lake Alternative site would have impacts similar to the proposed SES Solar Two site at Plaster City for 11 of the 20 environmental and engineering resource elements discussed above: air quality, hazardous materials, noise, public health, socioeconomics, waste management, worker safety and fire protection, facility design, power plant efficiency, power plant reliability, and transmission system engineering.

The SES Solar Two site is preferred over the Mesquite Lake Alternative site in three resource elements: traffic and transportation; geology, paleontology and minerals; and transmission line safety and nuisance. The Mesquite Lake Alternative site would require a significantly longer transmission interconnection that would be adjacent to residences in the City of Imperial for several miles.

The Mesquite Lake Alternative site is preferred over the proposed SES Solar Two site at Plaster City for six resource elements: land use, recreation, soils and water, biology, cultural resources, and visual resources. Impacts to biological and cultural resources are anticipated to be reduced at the Mesquite Lake Alternative site compared to at the SES Solar Two site because the Mesquite Lake Alternative site would be located on disturbed land. This would lessen the amount of sensitive species habitat that would be lost due to the construction of the project and would potentially lessen impacts to cultural resources. However, without having completed detailed site surveys of biological and cultural resources at the Mesquite Lake Alternative site, a detailed comparison is not possible.

Finally, as stated above, the Mesquite Lake Specific Plan Area is made up of approximately 70 parcels with 52 land owners. Due to the number of parcels that would have to be acquired, this alternative would make obtaining site control more challenging in comparison to obtaining a right-of-way grant for use of BLM administered land at the SES Solar Two site.

B.2.7.2 AGRICULTURAL LANDS ALTERNATIVE

The proposed SES Solar Two project is described above. Multiple scoping comments requested that an alternative site be considered on disturbed land, 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.

The RETI Phase 2A Draft Final Maps (9/01/09) highlight the Imperial Valley as a location of disturbed land with solar potential. A large amount of disturbed land occurs in the Imperial County; however, the majority of this land is active and viable farmland. In order to avoid impacting active agricultural land, no longer productive land or land that would not be economically viable for agriculture was considered. This land must also achieve most of the site selection criteria defined by SES and provided earlier in this section.

Local agencies were contacted in the Imperial County region and a representative of the Imperial Irrigation District (IID) Real Estate Division stated that land just west of the Westside Canal had been used for agricultural purposes in the past but that it was no longer economically viable for agricultural uses. As such, approximately 1,700 acres of this land had been put up for sale (Kelley 2009; confirmed by site visit August 2009).

Additionally, the IID advertised a surplus land sale in November 2009 that included up to 2,900 acres of agricultural land near the United States/Mexico border. This land, the Border Properties, had been advertised as “currently income producing agricultural use, but has excellent potential for renewable energy development or other commercial/ industrial use” (IID 2008). Bidding on the Border Properties closed on November 12, 2009. No additional information regarding the sale has been published by the IID.

This land would be within the Sonoran desert with appropriate slope and solarity requirements and would consist of nine ranches and twenty-three parcels. The land would be located approximately seven miles west of Calexico, adjacent to the Wisteria and Wormwood Canals.

Alternatives Figure 4 shows the Agricultural Lands Alternative sites. This alternative is made up of seven separate and unconnected parcels totaling 4,600 acres. The total acreage of the components of this alternative is 1,450 acres smaller than that of the proposed Plaster City site. As stated above, approximately 3,000 acres of the Plaster City site would be graded for the SES Solar Two project, including access roads, and infrastructure (SES 2008a). While it is assumed that additional acreage would be required for project design and to avoid shading, the exact acreage requirements are unknown at this time. If the project were not able to be constructed on 4,600 acres, the Agricultural Lands Alternative site considered here would not meet the project requirements and a combination of two alternative sites would be necessary. This would increase the cost of the project due to the need for additional infrastructure (transmission, water, etc.).

Because the parcels are not contiguous, the individual site areas in this alternative were numbered, as shown on the figure, to facilitate their description and analysis. Non-

contiguous parcels are considered to be viable as part of the Agricultural Lands Alternative because the SES project defines construction of separate groups of SunCatchers.

Parcel BL-1 contains approximately 1,700 acres and is located east of the proposed SES Solar Two site, and west of the Westside Main Canal, both north and south of I-8. Parcels BL-2, BL-3, BL-4, BL-5, BL-6 and BL-7 comprise approximately 2,900 acres just north of the United States/Mexico Border. Because this alternative would not be on contiguous land parcels, additional major equipment, transmission lines and substations, would be required for this alternative, increasing the cost of the project.

The BL-1 parcel is located on private land, north and south of Interstate 8 (I-8), approximately 0.5 mile south of the Ewan Hewes Highway. Property BL-1 has appropriate insolation and minimal slope and has been previously graded for agriculture. The elevation of the site is between sea level and 20 feet below sea level. The site would be accessed via I-8 at the Dunaway Road exit. There are no structures on this land although a windbreak of trees has been planted on the western side of the property.

Parcels BL-2 through BL-7 are located on private land north and south of Highway 98. BL-2, BL-3, and BL-4 would be accessed via Drew Road; BL-5 and BL-7 would be accessed via Brockman Road; BL-6 would be accessed via George Road. No structures are located on this land although there are some rural residences and farm structures adjacent to the land. This land is actively farmed.

Within the seven parcel groups identified on **Alternatives Figure 4**, the Agricultural Lands sites would be made up of approximately 25 separate parcels with two or three land owners. The Final Phase 2a Report published by the Renewable Energy Transmission Initiative (RETI) and updated in September 2009 identified private land areas for solar development only if there were no more than 20 owners in a two-square-mile (1,280-acre) area.

Parcel BL-1 is located immediately west of the IID Westside Canal and BL-2 through BL-7 are located east of the IID Westside Canal and west of the Wisteria Canal. Parcels BL-4 and BL-5 are traversed by the Greeson Wash. In order to avoid impacts to the wash, permanent structures (the SunCatchers) would not be allowed to be placed within the wash. Additionally, transmission crossings below the existing grade would have temporary impacts and road crossings would be designed to have minimal impacts. Minimal impacts means that arch crossings, bottomless culverts, or bridges would be used that allow full conveyance of hydrology and sediment and if necessary wildlife movement along this wash. All of the Agricultural Lands parcels have supported agricultural operations in the past, and many are currently in agricultural production.

Transmission Interconnection. The Agriculture Lands Alternative would require two separate transmission interconnections because the parcels are separated by about six miles. The existing Southwest Powerlink (SWPL) 500 kV transmission line passes between the two groups of parcels, providing a major corridor that could be used for this alternative.

The transmission interconnection for Parcel BL-1 would exit the parcel along the southwest corner and parallel the existing Southwest Powerlink (SWPL) corridor southeast for approximately 4.5 miles to reach the Imperial Valley Substation.

Parcels BL-2, BL-3, and BL-4 are contiguous and could share transmission facilities. Parcels BL-5, BL-6, and BL-7 are approximately 1 to 1.5 miles from those contiguous parcels. For purposes of the analysis, it is assumed that one 230 kV substation would be required on the north side of Parcel BL-2. Parcels BL-5, BL-6, and BL-7 would interconnect with Parcel BL-2 at a lower voltage. The 230 kV transmission interconnection would exit the new substation and head north for approximately 0.75 mile to reach the existing SWPL corridor. Here the 230 kV line would head west for approximately 1.75 miles to reach the Imperial Valley Substation. Because the alternative would likely require two interconnections with the Imperial Valley Substation (one for parcel BL-1 and one for parcels BL-2 through BL-7), it is possible that the transmission lines could be at a voltage lower than 230 kV.

Environmental and Engineering Assessment of the Agricultural Lands Alternative

Air Quality

Environmental Setting. Each local air quality district in California establishes its own significance criteria for environmental review of projects based on the specific conditions within each air basin. The Agricultural Lands Alternative site is located within the Salton Sea Air Basin, regulated by the Imperial County Air Pollution Control District (ICAPCD). The Agricultural Lands Alternative would be located approximately seven miles from Calexico and two miles from the U.S./Mexico border. The California-Mexico border region is characterized by air quality conditions that tend to be worse than elsewhere in the County. Imperial County (Calexico) persistently violates ambient air quality standards for PM10 and CO. Calexico is the only area of the State that does not meet the CO standards, apparently due to motor vehicle emissions and pollution transported from Mexico (CARB, 2006a). More specific information regarding the Salton Sea Air Basin and ICAPCD can be found in the Air Quality section of this SA/DEIS.

Environmental Impacts. Air quality impacts would principally consist of exhaust emissions from heavy-duty diesel and gasoline-powered construction equipment (*e.g.,* ozone precursors, NOx and VOC; other criteria pollutants, such as CO and PM10; and toxic diesel particulate matter emissions) and fugitive particulate matter (dust) from travel on unpaved surfaces. These emissions are described in the Air Quality section for the proposed project and would be essentially the same at any site.

Exhaust emissions would also be caused by workers commuting to and from the work sites, from trucks hauling equipment and supplies to the sites, and crew trucks (e.g., derrick trucks, bucket trucks, pickups). Because of the remoteness of the site, workers and trucks hauling equipment and supplies would have to commute 15 miles (to El Centro) or 120 miles (to San Diego) to reach the Agricultural Lands Alternative site.

Emissions from the construction and operation of a 750 MW solar project at the Agricultural Lands Alternative site would need to be controlled to satisfy the air permitting requirements of the ICAPCD. As such, construction and operation of the SES Solar Two

project at the Agricultural Lands Alternative would be subject to permit requirements, and it would require Energy Commission mitigation, similar to that of the proposed project, to avoid significant air quality impacts. Appropriate mitigation at the Agricultural Lands Alternative site would likely involve similar, locally oriented recommendations such as the Conditions of Certification presented in the **Air Quality** section of this SA/DEIS to reduce PM10 and CO impacts.

Comparison to Proposed Project. The construction and operation emissions resulting from building a 750 MW solar power plant at the Agricultural Lands Alternative site would be similar to the construction emissions for the SES Solar Two project at the proposed location. Both the Agricultural Lands Alternative site and the SES Solar Two site are located in somewhat remote areas with the potential for commuting from 20 to 120 miles, or local camping. Assuming implementation of similar Conditions of Certification, operational emissions from the Agricultural Lands Alternative site would be similar to those of the proposed SES Solar Two site.

Biological Resources

Environmental Setting. Imperial Valley is located in the Colorado Desert bioregion, encompassing all of Imperial County, the southeastern portion of Riverside County, the eastern end of San Bernardino County, and the eastern portion of San Diego County. This agriculturally rich bioregion is semi-arid and heavily irrigated (California Environmental Resources Evaluation System [CERES] 2009).

The Colorado Desert is the western extension of the Sonoran desert, which covers southern Arizona and northwestern Mexico. Much of the Colorado Desert land lies below 1,000 feet in elevation. Mountain peaks rarely exceed 3,000 feet. Common habitats include sandy desert, scrub, palm oasis, and desert wash. Summers are hot and dry, and winters are cool and moist (CERES 2009).

The Colorado Desert supports a diverse array of plant and wildlife species including the Yuma antelope, ground squirrels, white-winged doves, muskrats, southern mule deer, coyotes, bobcats, and raccoons. Rare animals include desert pupfish, flat-tailed horned lizard (FTHL), prairie falcon, Andrew's dune scarab beetle, Coachella Valley fringe-toed lizard, Le Conte's thrasher, black-tailed gnatcatcher, and California leaf-nosed bat. Rare plants include Orcutt's woody aster, Orocopia sage, foxtail cactus, Coachella Valley milk vetch, and crown of thorns (CERES 2009).

The Agricultural Lands Alternative would be located on disturbed lands. Parcel BL-1 was used for agriculture until the cost of irrigation made this site no longer profitable. BL-1 is located on Sonoran mixed salt desert scrub and Colorado desert wash scrub; however, this is also considered disturbed non-native vegetation (SES 2009n; CPUC 2008). Parcels BL-2 though BL-7 are located on cultivated cropland and hay/pasture land, with some desert riparian woodland adjacent to the washes and canals (SES 2009n).

The Westside Main Canal runs north-south along the east side of BL-1 and further south along the west sides of BL-2 and BL-3. Greeson Wash cuts diagonally through BL-4 and BL-5, while the Wistaria Canal crosses BL-6. The All American Canal parallels the south side of BL-7. BL-1 is just north of the BLM’s Yuha Basin Area of Critical

Environmental Concern (ACEC), which was established to conserve the flat-tailed horned lizard. The remaining parcels (BL-2 through BL-7) are surrounded by agricultural lands. Several bee boxes were observed on BL-1, which also is used by ORVs.

This alternative consists almost entirely of active and fallow agricultural lands, interspersed with irrigation canals and desert washes. BL-1 supports limited areas of Sonoran desert scrub, dominated by widely spaced creosote bush and four-wing saltbush (*Atriplex canescens*). A few small stands of desert dry wash woodland dominated by smoke tree (*Psorothamnus spinosus*) occur in the west-central portion of BL-1 in association with a small wash. Although subject to historical agricultural uses, BL-1 has remained fallow for at least a few years and native habitat is recovering.

The remaining parcels, BL-2 through BL-7, are active agricultural lands with little or no native habitat. BL-2, BL-3, BL-6, and BL-7 consist entirely of agricultural lands. BL-4 supports tamarisk/disturbed riparian scrub along the Greeson Wash. Undeveloped lands also occur along Greeson Wash through BL-5, but are disturbed and sparsely vegetated.

A total of five washes are thought to occur on site; access to this site was restricted to public roads, thus aerial interpretation was used to identify washes. All of these washes are jurisdictional to CDFG and likely to the Corps as well. In addition, the irrigation canals on site are potentially jurisdictional to the Corps and CDFG.

A reconnaissance survey of the Agricultural Lands Alternative was conducted in December 2009 (see the Mesquite Lake biological analysis for details of the survey procedure). Species detected on site include harvester ants (*Pogonomyrmex* sp.), desert cottontail, coyote, American kestrel, Say's phoebe (*Sayornis saya*), European starling (*Sturnus vulgaris*), western meadowlark, Gambel's quail, cattle egret (*Bubulcus ibis*), red-tailed hawk (*Buteo jamaicensis*), northern harrier, and burrowing owl. Numerous small rodent burrows also were observed in areas with native vegetation or fallow agriculture, as well as in disturbed habitat adjacent to canals. Riparian scrub areas along Greeson Wash provide nesting/foraging habitat for birds.

The Agricultural Lands Alternative would be located on sites that support burrowing owl and FTHL (SES 2009n). BL-1 is north of the Yuha Basin ACEC and provides additional potential habitat for flat-tailed horned lizard and other wildlife known from the ACEC, although I-8 acts as a barrier to wildlife movement between the northern and southern portions of this parcel. However, wildlife are able to cross below the interstate on a dirt road adjacent to the Westside Main Canal along the eastern boundary of BL-1.

Alternatives Table 4 lists sensitive species on and in the vicinity of the Agricultural Lands Alternative site.

Alternatives Table 4
California Natural Diversity Database Records for Sensitive Species Within Five Miles of the Agricultural Lands Alternative Sites

Common Name / *Scientific Name*	Status State/Fed/CNPS/BLM	Occurrence Within 5 Miles of Agricultural Lands Alternative Site

Common Name / *Scientific Name*	Status State/Fed/CNPS/BLM	Occurrence Within 5 Miles of Agricultural Lands Alternative Site
Chaparral sand verbena *Abronia villosa var. Aurita*	--/--/L1B/--	Occurs approximately 5 miles east of Parcel BL-1.
Brown turbans *Malperia tenuis*	--/--/L2/	Occurs approximately 1.5 miles southwest of Parcel BL-3.
Pink fairy-duster *Calliandra eriophylla*	--/--/2.3/--	Occurs within a 5-mile radius southwest of Parcel BL-2 and BL-3 site.
Hairy stickleaf *Mentzelia hirsutissima*	--/--/L2/--	Occurs within a 1-mile radius of Parcel BL-4.
Abrams' spurge *Chamaesyce abramsiana*	--/--/2.2/--	Occurs 5 miles northeast of Parcel BL-6.
Annual rock-nettle *Eucnide rupestris*	--/--/2.2/--	Occurs on Parcel BL-3 and BL-5.
Baja California ipomopsis *Ipomopsis effusa*	--/--/2.1/--	Occurs within a 5-mile radius southwest of Parcel BL-2 and BL-3.
Le Conte's thrasher *Toxostoma lecontei lecontei*	SSC/BSS/S	Occurs 2 miles west of Parcel BL-1.
Flat-tailed horned lizard *Phrynosoma mcallii*	SSC/--/--/BLMS	Occurs on Parcel BL-3 and BL-5 and within 5 miles of all parcels.
Yuma clapper rail *Rallus longirostris yumanensis*	FE/ST/--/--	Occurs approximately 5 miles northeast of BL-1.
Vermilion flycatcher *Pyrocephalus rubinus*	SSC/--/--/--	Occurs 2 miles north of Parcel BL-4.
Western yellow bat *Lasiurus xanthinus*	SSC/--/--/--	Occurs 2 miles north of Parcel BL-4.
Burrowing Owl *Athene cunicularia*	SSC/--/--/BLMS	Occurs adjacent to Parcels BL-2 through BL-7, potential habitat at site.
Barefoot banded gecko *Coleonyx switaki*	--/ST/--/--	Occurs 5 miles east of Parcel BL-1.
American badger *Taxidea taxus*	SSC/--/--/--	Occurs 5 miles north of Parcel BL-4.

Source: CNDDB 2009.

STATUS CODES:

Federal
FE = Federally listed endangered: species in danger of extinction throughout a significant portion of its range
FT = Federally listed, threatened: species likely to become endangered within the foreseeable future
BCC = Fish and Wildlife Service: Birds of Conservation Concern: Identifies migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent highest conservation priorities <www.fws.gov/migratorybirds/reports/BCC2002.pdf>

State
SE = State listed, endangered
ST = State listed as threatened
SSC = Species of special concern
WL = State watch list

California Native Plant Society
List 1B = Rare, threatened, or endangered in California and elsewhere
List 2 = Rare, threatened, or endangered in California but more common elsewhere
List 3 = Plants which need more information
List 4 = Limited distribution – a watch list
0.1 = Seriously threatened in California (high degree/immediacy of threat)
0.2 = Fairly threatened in California (moderate degree/immediacy of threat)
0.3 = Not very threatened in California (low degree/immediacy of threats or no current threats known)

BLM: Sensitive: Bureau of Land Management
BLM Manual § 6840 defines sensitive species as "…those species that are (1) under status review by the FWS/NMFS; or (2) whose numbers are declining so rapidly that federal listing may become necessary, or (3) with typically small and widely dispersed populations; or (4) those inhabiting ecological refugia or other specialized or unique habitats." <www.blm.gov/ca/pdfs/pa_pdfs/biology_pdfs/SensitiveAnimals.pdf>

Sensitive Species. Following are descriptions of the sensitive species habitat in the vicinity of the alternative site (CNDDB, 2009). Only the FTHL, burrowing owl, and annual rock-nettle occur on the alternative site. The descriptions of species provided earlier for the Mesquite Lake Alternative site are not repeated here.

- Chaparral sand verbena occurs in sandy areas within coastal sage scrub and chaparral from 80 to 1600 meters. Occurs in the central and southern south coast, and western Sonoran Desert.
- Brown turbans occurs in Sonoran desert scrub on arid slopes with shallow soils, rocky surface rubble with few large boulders, and little competition from shrubs.
- Pink fairy-duster is a deciduous shrub that occurs in Sonoran desert shrub, sandy or rocky.
- Hairy stickleaf is an annual herb that occurs in rocky Sonoran desert shrub in Imperial and San Diego Counties and Baja California.
- Abrams' spurge: see Mesquite lake alternative biological setting for details.
- Annual rock-nettle is an annual herb that is found in the Sonoran desert shrub at elevations between 500 and 600 meters.
- Thurber's pilostyles is a perennial herb that occurs in the Sonoran desert at elevations between sea level and 365 meters.
- Baja California ipomopsis is an annual herb that occurs in Imperial County and Baja California in chaparral and Sonoran desert scrub at elevations between sea level and 100 meters.
- Le Conte's thrasher habitat includes open desert scrub, washes, alkali desert scrub, and desert succulent shrub habitats.
- Flat-Tailed Horned Lizard (FTHL): see Mesquite Lake Alternative biological setting for details.
- Yuma clapper rail: see Mesquite Lake Alternative biological setting for details.
- Vermilion flycatcher range from southwestern United States to central Argentina and Uruguay. Breeding birds in colder regions such as the Mojave Desert withdraw at least partially in the winter; in the Mojave Desert the breeding distribution is known to extend as far west as the Morongo Valley in San Bernardino County.
- Western Yellow Bat: see Mesquite Lake Alternative biological setting for details.
- Burrowing owl: see Mesquite Lake Alternative biological setting for details.
- Barefoot banded gecko inhabits the eastern edge of the Peninsular Ranges from Palms to Pines Highway (SR 74) to the Baja California border. It occupies arid, rocky areas on flatlands and in canyons and thornscrub, especially where there are large boulders and rock outcrops and the vegetation is sparse. This species is known only from five localities in eastern San Diego County and western Imperial County. Anza-

Borrego Desert State Park (ABDSP) affords protection for some gecko habitat (CPUC 2008).

- American Badger occupies habitat that is dry in open treeless areas, grasslands, and coastal sage scrub.
- Pallin bat are common in grasslands and desert regions in the southwestern United States and most abundant in the Sonoran life zones. It is less abundant in evergreen and mixed forests than in vegetation assemblages characteristic of lower elevations.
- Townsend's big-eared bats' roosting sites are restricted to caves and cave-type dwelling such as tunnels, mines, and bridges. Big-eared bats are found in all habitats except subalpine and alpine. The bat is found only along the inland half of the west coast.

Two sensitive species were observed during the site reconnaissance: a single northern harrier was observed in BL-4, and two burrowing owls were observed in a burrow on a canal berm west of BL-6. Burrowing owls also have been documented on BL-1, and could potentially occur on any of the other BL parcels, as they are known from the vicinity. BL-1 supports approximately 500 acres of suitable habitat for flat-tailed horned lizard, and is located north of the Yuha Basin ACEC. No critical habitat occurs on or near the site. Sensitive plants are unlikely to occur on site due to extensive disturbance (ongoing and historical) from agriculture and development activities.

The following five animal species have high potential to occur on the BL-1 parcel: burrowing owl, prairie falcon, northern harrier, Le Conte's thrasher, and American badger. Three of these (burrowing owl, northern harrier, and prairie falcon) have high potential to occur in the remaining parcels (BL-2 through BL-7).

Environmental Impacts – Construction

Approximately 4,600 acres of agricultural land would be permanently lost as a result of vegetation clearing, grading, and construction of the solar facilities, potentially affecting special status animal species. Few, if any, impacts to listed or sensitive plant species would be expected because the site is active agricultural land.

Additional impacts would occur due to the construction of linear facilities associated with the project facilities at the Agricultural Lands Alternative site, including a transmission line approximately 7.5 miles long that would cross 6 miles of FTHL habitat.

Impacts/Mitigation to Wildlife. Building a solar facility at the Agricultural Lands Alternative site would primarily impact agricultural lands. As such, the project would impact few listed and sensitive wildlife species and their habitats at this site. The potential effect would likely be greatest for the burrowing owl, which is known to use agricultural land for foraging.

Any wildlife residing on this site would potentially be displaced, injured, or killed during project construction activities. Animal species in the project area could fall into construction trenches, be crushed by construction vehicles or equipment, or be harmed by project personnel. In addition, construction activities may attract predators or crush animal burrows or nests.

Burrowing Owl. The burrowing owl's numbers have been markedly reduced in California for at least the past 60 years. Conversion of grasslands, other habitat destruction, and poisoning of ground squirrels have contributed to the reduction in numbers in recent decades, which was noted in the 1940s and earlier. Within the past 20 years, however, and particularly within the past five years, the decline of burrowing owls in California appears to have greatly accelerated. Apparently, this has resulted because of habitat loss caused by increased residential and commercial development (CPUC 2008). Although the CNDDB does not show any record of the burrowing owl at the Agricultural Lands Alternative site, it has been observed nearby and could move onto the alternative site at any time. Burrowing owl survival can be adversely affected by human disturbance and foraging habitat loss, even when impacts to individual owls and burrows are avoided.

Migratory/Special Status Bird Species. The Agriculture Lands alternative site provides foraging, cover, and/or breeding habitat for migratory birds, including special-status bird species that may be present at the site. Project construction and operation could impact nesting birds in violation of the Migratory Bird Treaty Act. Preconstruction surveys and avoidance of nesting birds would reduce such impacts.

Spread of Noxious Weeds. Construction of a solar facility at the Agricultural Lands Alternative site could result in the introduction and dispersal of invasive or exotic weeds. The permanent and temporary earth disturbance adjacent to native habitats increases the potential for exotic, invasive plant species to establish and disperse into native plant communities, which leads to community and habitat degradation. A weed reduction program would potentially reduce and mitigate impacts.

Noise. Noise from construction activities could temporarily discourage wildlife from foraging and nesting immediately adjacent to the project area. Many bird species rely on vocalization during the breeding season to attract a mate within their territory. Noise levels from certain construction, operations, and demolition activities could reduce the reproductive success of nesting birds.

Operational Impacts

Operation of up to 7.5 miles of transmission line could result in increased avian mortality due to collision with new transmission lines. Mitigation would include installing the transmission line in accordance with the Avian Powerline Interaction Committee (APLIC) Guidelines designed to minimize avian-power line interactions.

Comparison to Proposed Project. This alternative consists primarily of active and fallow agricultural lands, although riparian habitat does occur along Greeson Wash as well as along an unnamed wash in BL-1. Several smaller washes are present on BL-1. The extensive agricultural fields provide foraging habitat for the burrowing owl, and berms adjacent to the canals provide locations for potential owl burrows. Suitable habitat for the flat-tailed horned lizard occurs only in BL-1. The biological constraints for this alternative are similar to that of the proposed project site, (owl and lizard habitat, presence of washes); though this alternative supports substantially less potential lizard habitat since approximately 68% (2,800 acres of the 4,105-acre site) are active agriculture (BL-2 through BL-7). Apart from bird species that may use the agricultural lands for foraging, general wildlife use of this alternative also would be expected to be less than for the proposed project site since much of it is actively farmed, while the

proposed SES Solar Two site supports primarily native desert scrub habitat. In summary, the Agricultural Lands Alternative site is preferred over the proposed Solar Two site for impacts to biological resources.

Cultural Resources

Environmental Setting. The Agricultural Lands Alternative site is located in the ancient Lake Cahuilla region. Detailed information regarding the formation of Lake Cahuilla and its history is provided in the **Cultural Resources** section of this SA/DEIS above for the Mesquite Lake Alternative.

The predominant evidence of human occupation in Imperial County during the Late Prehistoric Period is located along the ancient shoreline at approximately 12 meters (40 feet) above mean sea level and is exemplified by ceramic and lithic artifact scatters associated with rock rings and fish traps (CPUC 2008). Trails used by Native Americans as well as Spanish, Mexican, and American Period explorers are still evident in portions of the Imperial Valley and are typically associated with known water sources. During the historic period, agriculture was made possible through the development of a system of canals that directed water from the Colorado River to farmlands. The Imperial Irrigation District (IID) was formed in 1911 to acquire properties of the bankrupt California Development Company and its Mexican subsidiary (IID, 2009c). By 1922, the IID had acquired 13 mutual water companies, which had developed and operated distribution canals in the Imperial Valley (IID, 2009c). By the mid-1920s, the IID was delivering water to nearly 500,000 acres.

A cultural research records search was conducted in 2009 for the Agricultural Lands Alternative site which identified a total of 14 previously recorded cultural resources sites as shown in **Alternatives Table 5**, including:

- 6 lithic scatters
- 2 temporary campsites
- 3 historic sites
- 1 prehistoric sleeping circle site
- 2 sites located on the map but with the site forms missing.

The lithic scatters did not include temporally diagnostic artifacts or features, and the ceramics could not be attributed to specific, identifiable, temporal or cultural affiliation beyond association with the Late Prehistoric (SES 2009n).

Alternatives Table 5
Cultural Resources – Agricultural Lands Alternative Project Site

Resource	Description	Resource	Description
P-13-009541	Lithic scatter, 1 volcanic debitage	IMP-3400H	Historic, wagon road
P-13-009542	Lithic scatter, 1 fine grained debitage	P-13-009543	Lithic scatter, 1 volcanic debitage
IMP-2481	Lithic, 1 metate fragment	IMP-1413	Lithics, 5 lithic reduction loci with flakes, cores, hammerstone
IMP-301	Temporary campsite	IMP-8923	Historic, irrigation canal
P-13-008983	Historic, Wormwood Canal built around 1911	IMP-698/708	Lithic scatter, unknown
IMP-7661	Site form missing, unknown	IMP-1045/170	Temporary camp
IMP-408	Prehistoric house sites	IMP-1057	Site form missing, unknown

Source: SES 2009n.

Environmental Impacts. Fourteen known archaeological, architectural, or historical sites would potentially be affected by construction and operation a solar facility at the Agricultural Lands Alternative site. Conditions of Certification such as those required for the SES Solar Two project at Plaster City in the Cultural Resources section of this PSA/DEIS may reduce this impact; however, specific site surveys would be required to be certain.

Currently unknown, unrecorded cultural resources may be found at the Agricultural Lands Alternative site associated with the lower elevation recessional shorelines of Lake Cahuilla. As they are discovered, resources would be recorded and information retrieved. If the nature of the resource requires it, the resource would be protected. When discovered, cultural resources would be treated in accordance with applicable federal and state laws and regulations as well as the mitigation measures and permit requirements applicable to a project. As would be done during construction at the SES Solar Two Plaster City location, should resources be discovered during construction of current and future projects, they would be subject to legal requirements designed to protect them. The Agricultural Lands Alternative site would have a lower probability for the presence of significant cultural resources due to deep excavation for drainage tiles and recurring surface disturbance because of the intensive cultivation for agricultural use. The Imperial County General Plan EIR identifies most of the Agricultural Lands as having zero to rare cultural resources although some of Parcel BL-6 is located in an area identified as very sensitive for cultural resources (Imperial County 1993).

Comparison to Proposed Project. Development of a solar project at the Agricultural Lands Alternative site would likely have fewer impacts to cultural resources than the SES Solar Two site at Plaster City because the Agricultural Lands Alternative has been intensely disturbed for agricultural purposes. Additionally, most of the Agricultural Lands Alternative has been identified as having zero to rare cultural resources. As such, the Agricultural Lands Alternative is preferred to the proposed SES Solar Two site for impacts to cultural resources.

Hazardous Materials

Environmental Setting. The topography of the Agricultural Lands Alternative sites is essentially flat, as are the immediately surrounding areas. Sensitive receptors which in this case are single family residences, are located immediately adjacent to Parcels BL-2, BL-4, and BL-6. Additional rural residences are located 0.5 mile north of the BL-1, immediately north of Evan Hewes Highway.

Access to Parcel BL-1 would likely be via I-8 from El Centro to the Dunaway Road exit. At Dunaway Road, transport would turn north to Reynolds Road for 0.25 mile adjacent to open space. Access to Parcels BL-2 through BL-7 would likely be via Highway 98. From Highway 98, travel to BL-2, BL-3 and BL-6 would be via Drew Road, to BL-4 and BL-7 would be via Brockman Road, and to BL-5 would be via George Road. Transport would be adjacent to agricultural land.

Environmental Impacts. Hazardous materials use at the Agricultural Lands Alternative, including the quantities handled during transportation and disposal, would be the same as those of the proposed project. As stated in the Hazardous Materials section for the proposed project, hazardous materials used during the construction phase of the project would include gasoline, diesel fuel, motor oil, lubricants, and small amounts of solvents and paint. No acutely toxic hazardous materials would be used on site during construction, and none of these materials pose a significant potential for off-site impacts as a result of the quantities on site, their relative toxicity, their physical states, and/or their environmental mobility.

Hydrogen gas would be produced on site through electrolysis by one hydrogen generator. Hydrogen is identified as a hazardous substance based on its flammable characteristics. Although the project would not be subject to State or federal requirements for hydrogen storage, SES conducted an Offsite Consequence Analysis for the project and considered four worst-case scenarios. In the event of the worst case scenario induced from cumulative releases at the site, the maximum impacted distance is 0.13 mile (SES 2009q). As the Agricultural Lands Alternative site would have sensitive receptors within 0.13 miles, the release of hydrogen could pose a significant impact. Conditions of Certification and compliance with applicable LORS would reduce this impact.

Transportation of hazardous materials to the Agricultural Lands Alternative site would require passing by rural residences located along Drew Road, Fisher Road, Brockman Road, and Kubler Road. After exiting I-8, transportation of hazardous materials would be on smaller roads with some residences.

Comparison to Proposed Project. The hazardous materials that would be used at the Agricultural Lands Alternative site would be the same as those used at the proposed SES Solar Two site; both the Agricultural Lands Alternative site and the proposed site have sensitive subgroups within a five-mile radius. Compared to the proposed project, selecting the Agricultural Lands Alternative site would result in slightly greater impacts from transportation of hazardous materials as they would travel on smaller roads with adjacent scattered rural residences. With adoption of the proposed Conditions of Certification, the Agricultural Lands Alternative would comply with all applicable laws, ordinances, regulations, and standards (LORS) and result in no significant impacts to the public.

The Agricultural Lands Alternative site would potentially result in greater impacts from hydrogen storage at the facility because Parcels BL-2 through BL-7 have sensitive receptors located within 1,000 feet of their borders.

Land Use

Environmental Setting. The Agricultural Lands Alternative site is agricultural land. BL-1 is owned by two owners and BL-2 through BL-7 are lands owned by the IID advertised as “surplus lands” and up for sale to the public in the last quarter of 2009.

Parcels BL-2 through BL-7 are currently used for farming and were advertised as income producing medium quality farmland. Imperial County Land Use General Plan designated the sites as agricultural use.

Parcel BL-1 is located on land previously used for agriculture production. This land is no longer economically viable for agriculture production due to the cost of pump irrigation. As such, the land was proposed for development of a mixed-use project which would incorporate approximately 3,800 residences, one or more lakes, a golf course, and commercial development (CPUC 2007). The status of this development project is unknown at this time; and as of the third quarter 2009, the land along I-8 is advertised for sale. Parcel BL-1 is not currently in use.

According to the Imperial County General Plan Land Use Element, industrial uses are not permitted on agricultural lands except for those directly associated with agricultural products and processes. Electrical and other energy generating facilities are considered heavy industrial uses except for geothermal, hydroelectric, wind and solar facilities which may be regulated differently than other types of power plants. Geothermal plants may be permitted in agricultural lands with a conditional use permit subject to zoning and environmental review.

In April 2009, Imperial County and the IID signed a Joint Resolution for the Creation of an Imperial Valley Renewable Energy Development Program to promote renewable energy resources in Imperial Valley (Imperial County 2009a). This resolution encourages the growth of renewable energy in Imperial Valley and focuses on creating a data bank where developers, investors and government regulators can access available data about permitting processes and encourages both the IID and Imperial County to maximize development of renewable resources in a manner consistent with sound environmental and land use planning principles (Imperial County 2009a). However, because the proposed project is a result of a Power Purchase Agreement between San Diego Gas & Electric and the Applicant, development of this project would not contribute to Imperial County's energy supplies. As such, development of the Agricultural Lands Alternative could be inconsistent with the IID and Imperial County Joint Resolution.

Agriculture. Agriculture is the most important industry in Imperial Valley, with over 500,000 acres of land used for agriculture production and a gross net value of over $1.5 billion in 2008 (Imperial County 2009).The Agricultural Lands Alternative site is comprised of active and previously farmed agricultural lands. Parcel BL-1 is mapped as “other” land by the California Department of Conservation (DOC 2006). Approximately 2,600 acres of Parcels BL-2 through BL-7 are mapped as Farmland of Statewide Importance and approximately 300 acres of Parcels BL-2 thought BL-7 are mapped as Prime

Farmland (DOC 2006). Prime Farmland includes lands with the best combination of physical and chemical features able to sustain long-term agricultural production that has been used for irrigated agriculture within the previous four years. Farmland of Statewide Importance is similar to Prime Farmland with some shortcomings such as a greater slope or lesser ability to store soil moisture.

Aerial spraying (i.e., crop dusting) is used to control insects, weeds, and diseases that may affect crops in the Imperial Valley. Aerial spraying occurs in those areas of the Imperial Valley actively cultivated with field crops. Aerial applicators fly at low elevations and sometimes at speeds in excess of 100 miles per hour. Fatalities associated with aerial applicators can partly be attributed to flying at low altitudes and high speeds, as well as the presence of obstacles such as power lines, trees, towers, or buildings within the flight area (CPUC, 2008). Where transmission lines exist in an agricultural area, pilots must fly over, beside, and (occasionally) under the lines to complete aerial spraying activities. Transmission lines and towers thus present a substantial obstacle to be avoided during aerial spraying operations, and require additional attention from the pilots. Because the new transmission line would follow the existing SWPL ROW, the impact to aerial spraying may be reduced; however, approximately 0.5 mile of the transmission line would require new transmission ROW.

The Agricultural Lands Alternative site is located approximately six miles west of Calexico and seven miles southwest of El Centro.

Sensitive Land Uses. Parcel BL-1 is located 2,640 feet south of a community with approximately 20 residences known as Imperial Lakes along West Evan Hewes Highway. Approximately 10 residences are located within 2,500 feet of Parcels BL-2 through BL-6, with some residences within several hundred feet of the boundary of this site. No other sensitive receptors are located within 2,500 feet of the site.

Transmission Interconnection. As stated above, the Agricultural Lands Alternative would require approximately 7.5 miles of new 230 kV transmission line to reach the Imperial Valley Substation. The route would cross approximately 6.0 miles of BLM land before entering the substation. This land is part of the California Desert Conservation Area (CDCA). The Energy Production and Utility Corridor Element of the CDCA Plan established a network of joint-use planning corridors intended to meet the projected utility service needs at the time the Plan was written. The transmission line would be developed on BLM land within the CDCA planning area designated utility corridor N; therefore a Plan Amendment would not be required.

Environmental Impacts. Because of the desire to consider use of disturbed lands for large solar projects, the Agricultural Lands Alternative site is located on active and non-active agricultural lands. The Imperial County General Plan states that, in general, industrial uses are not permitted on agricultural lands; however, some renewable energy is allowed on agricultural lands with a conditional use permit subject to zoning and environmental review.

The construction and operation of the SES Solar Two project at the Agricultural Lands Alternative site would result in the conversion of up to 2,900 acres of actively-used

agricultural land to renewable energy production. The construction and operation of the solar power plant would eliminate the existing agricultural operations and foreseeable future agricultural use on this site. This loss of agricultural lands is a potentially significant impact, and would likely require mitigation to offset the loss. As with the proposed SES Solar Two site, the California Agricultural LESA Model was used to assess impacts to the Agricultural Lands Alternative site. See the **Land Use** section of this SA/DEIS for more details on the LESA Model. The LESA Model for the Agricultural Lands Alternative site was conducted in accordance with the detailed instructions provided in the LESA Model Instruction Manual. The LESA score is based on a scale of 0 to 100. The Final LESA score for the Agricultural Lands parcel BL-1 is 38.03. The Final LESA score for the Agricultural Lands parcels BL-2 through BL-7 is 76.22. Based on the California Agricultural LESA Thresholds, a score of 38.03 would not result in adverse effects due to the permanent conversion of 1,200 acres of Farmland. However, a score of 76.22 would result in significant adverse effects due to the permanent conversion of 2,900 acres. This alternative would result in the conversion of 2,900 acres of agriculture land with an industrial utility use (i.e., a 750 MW power plant and associated infrastructure). As stated above, agriculture is the most important industry in Imperial Valley with over 500,000 acres of land used for agriculture production. This amount of land conversion along with all other existing, planned, and proposed projects would result in adverse cumulative land conversion. The completed LESA Model worksheets for the Agriculture Lands parcels are included within **APPENDIX Alts-1** at the end of this section.

Construction activities for the alternative would create temporary disturbance to residential areas (i.e., heavy construction equipment on temporary and permanent access roads and moving building materials to and from construction staging areas). Conditions of Certification to reduce noise and air quality impacts are presented in the Noise and Air Quality sections of this SA/DEIS for the proposed SES Solar Two site. Because this disturbance would be temporary at any one location, the impacts would likely be less than significant.

Comparison to Proposed Project. Selecting the Agricultural Lands Alternative site would not require the use of BLM land, and would not require a land use plan amendment. However, use of the Agricultural Lands Alternative site would result in greater impacts to agricultural land than the project site at Plaster City, including the loss of Prime Farmland and Farmland of Statewide Importance and the loss of approximately 2,900 acres of active farmland resulting in a significant impact per the LESA model. Loss of agricultural lands would likely require Conditions of Certification to offset the loss of these lands.

Additionally, the Agricultural Lands Alternative site would be located within 2,500 feet of approximately 10 residences and 2,500 feet of an additional 20 residences. Because more sensitive receptors would be impacted by the indirect impacts of constructing the project at the Agricultural Lands Alternative site, this impact would be greater than at the proposed site in Plaster City.

Recreation and Wilderness

Environmental Setting The Agricultural Lands Alternative site is located primarily on active and previously farmed agricultural land. No recreation opportunities are available at the Agricultural Lands Alternative site. The Imperial Lakes community, approximately

0.5 mile north of parcel BL-1 includes two 15-acre tournament style water-ski lakes used for non-commercial recreation.

Additional sensitive lands in the vicinity of this site include the BLM Yuha Basin ACEC, immediately west of parcel BL-1 and approximately one mile west of parcels BL-2 through BL-7, and the Plaster City Open Area approximately one mile north of the parcel BL-1. The Yuha Basin ACEC and Plaster City Open Area are discussed further in the **Land Use Table 1** in the **Land Use** section of this SA/DEIS.

Environmental Impacts. A solar facility at this site would have no direct impact on land used for recreation nor would it displace any existing recreation uses. The proposed project would have an indirect impact on recreational users due to its impact on the visual landscape. Some proportion of recreational users may ultimately prefer to visit other areas due to the changed viewshed presented by the SES Solar Two project should it be built at the Agricultural Lands Alternative site.

Landscaping would be provided on the Agricultural Lands Alternative site to block views of the solar facilities from the Imperial Lakes community. This landscaping, in addition to the distance between Parcel BL-1 and the Imperial Lakes community recreation facilities, may partially block some views of the project facilities. However, it is unlikely that the distance and landscaping would entirely block the solar project due to the height of the Stirling engine systems and the overall size of the facility.

Comparison to Proposed Project. Parcel BL-1 of the Agricultural Lands Alternative would be nearer to the recreational users at the Imperial Lakes ski lakes than the proposed site, and equally near recreational users within in the Yuha Basin and the Plaster City Open Area. However, Parcels BL-2 through BL-7 would impact no recreation areas. Overall, impacts to recreational users would be less at the Agricultural Lands Alternative site compared with the SES Solar Two Plaster City site.

Noise and Vibration

Environmental Setting. Generally low levels of ambient noise exist along the Parcels BL-2 through BL-7 as these parcels are used for agriculture and are located approximately 4.7 miles south of I-8. Noise levels at Parcel BL-1 would be elevated due to the presence of I-8, and the aircraft associated with the NAF El Centro Desert Range.

Intermittent noise is expected to occur at the northern side of parcel BL-1 where the alternative site is located within 2,600 feet of the Imperial Lakes residential community. Nearby sensitive receptors include this community and the scattered rural residences adjacent to Parcels BL-2 through BL-7. The nearest residential area would be about 100 feet from the southern boundary of parcel BL-2 and the northern boundary of BL-3. The nearest sensitive receptors to the proposed SES Solar Two site at Plaster City are at a distance of 3,300 feet.

Environmental Impacts. As stated in the **Noise** section of this SA/DEIS, the construction of the SES Solar Two project would create noise, or unwanted sound. The character and loudness of this noise, the times of day or night at which it is produced, and the proximity of the facility to sensitive receptors combine to determine whether the facility

would meet applicable noise control laws and ordinances and whether it would cause significant adverse environmental impacts.

The Agricultural Lands Alternative site is located in an area dedicated to agricultural uses. Scattered rural residences are located within 100 feet of the boundaries of the Agricultural Lands Parcels BL-2 though BL-7.

Comparison to Proposed Project. Building the SES Solar Two project at the Agricultural Lands Alternative site would create a slightly greater impact than at the Plaster City site because of the closer proximity to a greater number of sensitive receptors (residences).

Public Health and Safety

Environmental Setting. The Agricultural Lands Alternative site is located in an isolated area primarily dedicated to farming. The nearest residences are located approximately 100 feet from parcels BL-2 and BL-3. There are no nearby schools or other sensitive receptors.

Environmental Impacts. While the meteorological conditions and topography at the site are not exactly the same as at the proposed Plaster City site, they are similar enough that the results of air dispersion modeling and a human health risk assessment for the Agricultural Lands Alternative site would be expected to be very similar to that for the proposed site. The cancer risk and hazard indices are much below the level of significance at the point of maximum impact, so the project would be unlikely to pose a significant risk to public health at this location. See the **Public Health and Safety** section of the SA/DEIS for more details on the cancer risk and hazard indices analysis.

Comparison to Proposed Project. There is no substantial difference between this location and the proposed site for public health.

Socioeconomics and Environmental Justice

Environmental Setting. Like the proposed SES Solar Two site, the Agricultural Lands Alternative site is located in Imperial County. The demographic characteristics of Imperial County are described in the **Socioeconomics and Environmental Justice** section of this SA/DEIS.

Environmental Impacts. Construction workers would most likely be from larger nearby cities such as El Centro, Calexico and San Diego. While there is limited housing available in the vicinity of the Agricultural Lands Alternative site, workers could commute from El Centro or Calexico, approximately seven miles east of the Agricultural Lands Alternative site. An additional option would be to erect temporary housing in the immediate area of the Agricultural Lands Alternative site; however, this would increase the project related construction impacts and require provision of additional services such as electricity, water, and food. Because it is unlikely that the construction workers would relocate to the immediate vicinity of the Agricultural Lands Alternative site, this alternative would not cause a significant adverse socioeconomic impact on the area's housing, schools, police, emergency services, hospitals, and utilities.

Development of a 750 MW solar plant at the Agriculture Lands alternative site area would potentially impact the Sheriff's Office due to increased demand for service as a result of calls for service during construction and operation. Use of this site for a 750 MW project may require mitigation that would provide for fees to offset the cost of providing additional deputies for this service. The inclusion of mitigation fees would reduce this impact to less than significant.

There would be no adverse socioeconomic impacts since most of the construction and operation workforce is within the regional labor market area, and construction activities are short-term. The socioeconomic benefits from the SES Solar Two project, should it be built at the Agricultural Lands alternative site, are likely to be similar to the benefits from SES Solar Two project in the Plaster City area. Those benefits include increases in sales taxes, employment, and income for Imperial County.

Comparison to Proposed Project. The socioeconomic impacts of the SES Solar Two project at the Agricultural Lands Alternative site would be similar to building and operating the project at the proposed site.

Soil and Water Resources

Environmental Setting. Soils in the Agricultural Lands Alternative site include Imperial Glenbar, Imperial Clay, Holtville Foam, Holtville Silty Clay, and Meloland (IID 2008). Some of these soil types are considered Prime Farmland and Farmland of Statewide Importance when irrigated.

The Agricultural Lands Alternative site lies within the Imperial Subregion of the Colorado River Basin Region 7, west of the New River described in the setting for the proposed project. Site topography is flat and with the exception of Parcel BL-1, currently dedicated to agriculture. Parcel BL-1 is graded for agriculture and has been farmed in the past. Parcels BL-4 and BL-5 are crossed by the Greeson Wash. The Greeson Wash in Parcel BL-4 is mapped by FEMA as Flood Zone A (100-year flood zone with no base flood levels determined).

Parcel BL-2 is directly downstream of, and across the Westside Main Canal from, the Pinto Wash, described by Imperial County (Imperial County, 2007) as having caused more damage from flooding and sediment deposition than the other washes in the county. The Pinto Wash has overflowed the Westside Main Canal and caused severe damage on several occasions. For instance, Imperial County (2007) states that in 1976: "Extensive damage was caused from overflows from this (the Pinto) wash and from the breached Westside Main Canal. The floodwaters originated in Mexico and built up to a head of water, eight to ten feet high in places where first the cultivated fields were flooded, then spread out inundating a large area three to four feet deep. Crops damaged in this area were mostly cotton and alfalfa. Grain and sudan grass were also damaged. Large quantities of sediment were deposited in fields resulting in total destruction of crops. Fields had to be re-leveled and replanted, causing some late planting of crops which resulted in loss of profits. Approximately 1,750 acres of agricultural land were flooded." Based on the position of Parcel BL-2 downstream of the FEMA Pinto Wash floodplain, much of this damage could have been on the BL-2 parcel.

A portion of the southeastern part of Parcel BL-1 is within the FEMA-designated Zone A of the Yuha Wash, also described by Imperial County as capable of causing severe flood damage.

The Agricultural Lands Alternative lies above the Imperial Valley Groundwater Basin described for the proposed project.

The Agricultural Lands Alternative parcels are located within the Imperial Irrigation District and as such, water for the project at this site would be available from the IID. Parcels BL-2 through BL-7 are located east of the Westside Main Canal. Parcel BL-1 is located west of the Westside Main Canal and would require pumping for the water to reach the site. Reclaimed water may also be available from the Seeley Waste Water Treatment Facility as with the proposed SES Solar Two site.

Environmental Impacts

Soil Erosion Potential by Wind and Water. As discussed in the **Soils and Water** section of this SA/DEIS, construction activities can lead to adverse impacts to soil resources including increased soil erosion, soil compaction, loss of soil productivity, and disturbance of soils crucial for supporting vegetation and water-dependent 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 loading to nearby receiving waters. Although access to the site would be from existing roads, construction of the solar dish array would require a substantial construction of local access roads as in the proposed project. While the volume of earth movement required at the alternative site is unknown, the topography and slope of the Agricultural Lands Alternative site are less severe than at the proposed SES Solar Two site.

The Agricultural Lands Alternative is subject to flooding from the Gleeson Wash, the Pinto Wash, and the Yuha Wash, but with the exception of the Gleeson Wash, which would likely be avoided due to locally steep terrain and flooding impacts, the alternative does not have major drainage channels. Assuming the Gleeson Wash would be avoided, the Agricultural Lands Alternative would not have the erosion-related and stream morphology impacts described for the proposed project. Rather, being situated in a flat area downstream of two major desert washes, portions of the Agricultural Lands Alternative would be subject to sediment deposition and flooding from large floods on these washes. This impact would primarily affect the project itself, but the adverse effect could be significant. It may not be possible to practically mitigate this impact except by mapping and avoiding the severe hazard areas, which would result in a smaller alternative.

As at the Solar Two site, grading plans, a Storm Water Pollution Prevention Plan (SWPPP), and a Drainage Erosion and Sediment Control Plan (DESCP) would be required. Due to the flat terrain and existing disturbed condition of this site, the SWPPP and DESCP would likely be sufficient to mitigate soil erosion impacts to a level less than significant, provided the high hazard areas of the Pinto and Yuha washes could be avoided.

Water Supply. The specific source of water supply for the Agricultural Lands Alternative is unknown. The most-likely source is water supplied by the Imperial Irrigation District

via the Westside Main Canal which is located immediately adjacent to the alternative site. Potable water would be from the same source as for the proposed project.

Wastewater/Storm Water Quality. Storm water runoff from the site during construction and operation could have similar impacts as those for the proposed project. The site construction will require a SWPPP which will specify Best Management Practices (BMPs) to minimize or eliminate water contamination. Water quality impacts would likely not be significant.

Sanitary waste disposal would likely be through on-site facilities as for the proposed project. No significant adverse impact is anticipated.

Comparison to Proposed Project. The level, disturbed terrain lacking in existing drainageways on the Agricultural Lands Alternative results in a lesser Hydrology, Water Use and Water Quality impact for the Agricultural Lands Alternative than for the proposed project in the area of soil erosion and stream morphology, but significant impacts could still occur as a result of a portion of this alternative being at the receiving end of Pinto Wash and Yuha Wash flows. Significant impacts could likely be avoided by not constructing in high hazard areas. Water supply to the Agricultural Lands Alternative would most likely be from the IID.

Traffic and Transportation

Environmental Setting. The Agricultural Lands Alternative would include parcels both north and south of I-8. Access to parcel BL-1 would be via I-8 to the Dunaway Road exit. Parcels BL-2 through BL-7 would be accessed via the Drew Road exit off of I-8. Parcel BL-2 is located approximately five miles south of I-8 at Drew Road. An alternative access to Parcel BL-2 would be via Highway SR 98. Local roads in the region can be used to access BL-4 (Pullman Road), BL-5 (Brockman Road), BL-6 (George Road) and BL-7 (Brockman Road).

Workers employed during construction of the project at this alternative site would most likely commute from El Centro or Calexico (7 miles) or San Diego (120 miles). As with the proposed SES Solar Two site, I-8 would be the primary access road.

Environmental Impacts. A construction traffic control and transportation demand implementation program would need to be developed in coordination with Caltrans before construction could occur at the Agricultural Lands Alternative. This analysis may result in the need to limit construction-period truck and commute traffic to off-peak periods to avoid or reduce traffic and transportation impacts. These impacts would likely be similar to those of the proposed project as both projects would require the use of I-8 and other smaller access roads. Highway 98 could also be used to access the Agricultural Lands Alternative to avoid use of the smaller access roads off of I-8.

As with the Mesquite Lake Alternative, improvements to Highway 98 and other local roads may be required to accommodate the increased use. Caltrans may also require that all intersections continue to operate at a LOS C or better and any increase in delay at these intersections from project-related traffic would need to be analyzed (Imperial County 2006). Funding for the necessary improvements of Highway 98 and other roads other than developer-installed improvements and impacts fees have not been identified

by Imperial County and as such, the impacts would not be fully mitigated until funding were established to accommodate the improvements (Imperial County 2006).

Glare. Similar to the proposed project, there is the potential for highly distracting diffuse glare from the project to affect nearby motorists. Staff developed **CONDITION OF CERTIFICATION VIS-6**, which requires mitigation in the form of physical screening (berms, fencing, landscaping, or similar means) along the length of the project adjacent to Interstate 8. That measure would be adapted to this alternative and would apply to adjacent roadways.

Comparison to Proposed Project. Impacts to traffic and transportation at the Agricultural Lands Alternative site would be similar to those at the proposed SES Solar Two site.

Transmission Line Safety and Nuisance

Environmental Setting Parcel BL-1 of the Agricultural Lands Alternative site would connect with the SDG&E system at the Imperial Valley Substation through a new transmission line that would exit this parcel and head south for approximately 0.8 mile, then turn southeast for approximately four miles. This transmission line would be located adjacent to the existing SWPL ROW. Parcels BL-2 through BL-7 would require interconnection at a lower level before following the existing SWPL ROW west to the existing Imperial Valley Substation. It is assumed for this alternative assessment that the output from parcels BL-2 through BL-7 would be gathered on BL-2 using an overhead collection circuit of between 34.5 kV and 230 kV. The collector substation on BL-2 would connect to the Imperial Valley Substation using a 230 kV interconnection transmission line. This line would exit parcel BL-2 to the north approximately 0.5 mile to reach the existing SWPL ROW, and turn east for approximately 2.5 miles to reach the Imperial Valley Substation. This transmission line would be within 500 feet of approximately two residences. Underground collector lines could also be used to bring power from parcels BL-3 through BL-7 to parcel BL-2.

Environmental Impacts. Similar to the proposed project, this alternative site would not be likely to cause transmission line safety hazards or nuisances with implementation of Conditions of Certification such as those described in the **Transmission Line Safety and Nuisance** section of the SA/DEIS. The potential for nuisance shocks would be minimized through grounding and other field-reducing measures that would be implemented in keeping with current standard industry practices, and the potential for hazardous shocks would be minimized through compliance with the height and clearance requirements of CPUC's General Order 95. Compliance with Title 14, California Code of Regulations, section 1250, would minimize fire hazards, while the use of low-corona line design, together with appropriate corona-minimizing construction practices, would minimize the potential for corona noise and its related interference with radio-frequency communication in the area around the route.

As with the proposed SES Solar Two transmission lines, the public health significance of any related field exposures cannot be characterized with certainty. The only conclusion to be reached with certainty is that the proposed lines' design and operational plan would be adequate to ensure that the generated electric and magnetic fields are managed to an extent the CPUC considers appropriate in light of the available health effects information.

Comparison to Proposed Project. The Agricultural Lands Alternative site would require a shorter transmission line interconnection with the SDG&E transmission system. While the electric and magnetic fields would be managed to an extent the CPUC considers appropriate, the transmission line would be located near approximately two residences. Additionally, the Agricultural Lands Alternative site would potentially require longer interconnections between the different parcels that make up the alternative. Because the transmission interconnection for the proposed site would not be located within 500 feet of any residential properties, this impact would be greater for the Agricultural Lands Alternative site than for the proposed site.

Visual Resources

Environmental Setting. The Agricultural Lands Alternative site parcels would be located entirely on current or previously farmed land. There are few buildings in the area which are primarily scattered rural residences. IID canals border BL-1 to the east and BL-2 and BL-3 to the west. The SWPL transmission line, the I-8 freeway, and Highway SR-98 introduce a more developed and industrial feature to the otherwise agricultural setting. Viewer concern, as defined in the **Visual Resources** section of the SA/DEIS, of the project should it be developed at the Agriculture Lands alternative site would be moderate. The number of residential viewers represented in this view is low, and their focus on scenic values in this agriculture- oriented context is considered moderately low.

Nearby views from Parcels BL-2 through BL-7 to the north, south, west and east are of actively farmed lands crossed by water canals, some paved roads, and rural residences. Views from parcel BL-1 to the east are of active agriculture and canals, and to the west of open space. Parcel BL-1 has a wind break surrounding its border which would offer some view blockage of the site should the trees remain in place. There is little elevated land surrounding the parcels to offer views of this alternative site other than from the I-8 which traverses Parcel BL-1. Views of Parcel BL-1 from the I-8 would be prominent for approximately one mile and, as with the proposed site, viewer exposure would be high along the I-8.

Environmental Impacts. As stated in the **Visual Resource** section, the Energy Commission staff, in coordination with BLM, applied the BLM Visual Resource Management (VRM) system of visual assessment to the proposed SES Solar Two site at Plaster City. VR Classes are analogous to Overall Sensitivity ratings under the Energy Commission method and are used to determine an area's visual objective, that is, the level of project-caused contrast that is acceptable, above which contrast could constitute a potentially significant adverse impact.

For non-BLM land, the visual impact analysis would be based on a comparison of the area's visual sensitivity with the industrial features added by the solar project at this location. With the addition of the project, views of the agricultural lands would change from a pastoral, rural landscape to a substantially more industrial, highly altered one. The industrial landscape would be dominated by the thousands of SunCatchers, approximately 38 feet high by 40 feet wide. There would be no natural features to block the view of the solar facilities on any side of Parcels BL-2 though BL-7. A wind break would potentially block some of Parcel BL-1 from the residential neighborhood north of

the site. However I-8 crosses the site and is elevated in this area, and as such passing motorists would be able to look down on the parcel.

Like the proposed project, the Agricultural Lands Alternative site would be prominently visible from I-8 (Parcel BL-1) for both westbound and eastbound traffic, and from Highway SR 98 (Parcels BL-2 through BL-7). Travelers would be immediately adjacent to the site, and there is little elevation or natural contouring to block views of the SES project components from these roads.

The linear facilities associated with the Agricultural Lands Alternative site include two 230 kV transmission lines approximately 4.8 and 3 miles long, respectively. Additionally, lower voltage transmission lines would be required to connect the output of the generator step-up unit groups to an on-site collector substation. As such, it is likely that Parcel BL-1 would require a 34.5 kV connector circuit to cross the I-8 on wood poles. The 230 kV transmission lines would follow the existing utility ROW and would roughly parallel an existing SWPL 500 kV transmission line for the entire length of their interconnection. The Agricultural Lands Alternative site interconnection would introduce additional industrial character to the area; however, because the land is primarily used for agriculture and open space, few viewers would see the new transmission lines.

Glare. Similar to the proposed project, there is the potential for general brightness of light not directed back at the mirrors. Staff developed **CONDITION OF CERTIFICATION VIS-6**, which requires mitigation in the form of physical screening (berms, fencing, landscaping, or similar means) along the length of the project adjacent to Interstate 8 to protect nearby motorists from glare. That measure would be adapted to this alternative and would apply to adjacent roadways. Because the Agricultural Lands Alternative would have residences within 500 feet of the alternative, an additional Condition of Certification would be required. The Condition of Certification would require the applicant to respond to complaints regarding glare and brightness. Specifically the applicant would be required to respond to third-party complaints of glare and brightness generated by operation of the project by investigating the complaints and by implementing feasible and appropriate measures (such as building higher physical screening).

Comparison to Proposed Project. The Agricultural Lands Alternative site is preferred over the proposed SES Solar Two site for visual resources. The Agricultural Lands Alternative site would be located in a slightly more developed setting near existing agriculture land, and this alternative site is further from recreation areas than the proposed site. Both sites would be prominently visible to travelling motorists on I-8; however, the views of Parcel BL-1 would last for a shorter duration than those of the proposed site. Highway 98 is less travelled than I-8 and fewer people would be exposed to views of Parcels BL-2 through BL-7 from that road. As a result, a solar project at the proposed site would affect a greater number of viewers than a project at the Agricultural Lands Alternative site.

The Agricultural Lands Alternative site transmission line would create a visual impact similar to that of the SES Solar Two proposed site interconnection. The interconnection transmission line at the Agricultural Lands Alternative site would be of a similar length as the proposed site and would be located adjacent to the same existing corridor.

Waste Management

Environmental Setting. The nearest hazardous materials release to this site was identified as a leaking underground fuel tank approximately one mile north of Parcel BL-1 (Envirostor 2009). Additionally, the site would be located on actively or previously farmed land and it is possible that the site has been contaminated by agriculture residues.

As stated in the **Waste Management** section, hazardous and nonhazardous solid and liquid waste, including wastewater, would be generated at the SES Solar Two project during construction and operation of the solar power plant. Waste would be recycled where practical and nonrecyclable waste would be deposited in a Class III landfill. See the Mesquite Lake Alternative analysis for a discussion regarding the hazardous waste generated by the project. The Agricultural Lands Alternative would use the same landfills as those identified for the Mesquite Lake Alternative.

Environmental Impacts. Construction at the Agricultural Lands Alternative site would require excavation of fill material that underlies the site. Both nonhazardous and hazardous wastes would be created by the construction of the SES Solar Two project at the Agricultural Lands Alternative site in similar quantities as at the proposed site and would be disposed of at appropriate facilities. The applicant would be required to obtain a unique hazardous waste generator identification number for the site prior to starting construction and would be required to comply with similar Conditions of Certification. The project would produce minimal maintenance and plant wastes.

All nonhazardous wastes would be recycled to the extent possible, and nonrecyclable wastes would be regularly transported off site to a local solid waste disposal facility. Generation plant wastes include: oily rags, broken and rusted metal and machine parts, defective or broken electrical materials, empty containers, and other miscellaneous solid wastes, including the typical refuse generated by workers. As with the proposed project, all construction and operation activities would need to be conducted in compliance with regulations pertaining to the appropriate management of wastes. The total amount of nonhazardous waste generated from the project is estimated to be 80 cubic yards of solid waste per week from construction, and approximately 10 cubic yards per week from operation. Staff finds that disposal of the solid wastes generated by the SES Solar Two facility can occur without significantly impacting the capacity or remaining life of any of these disposal facilities.

Like nonhazardous wastes, hazardous wastes would be recycled to the extent possible. The two cubic yards per week of hazardous waste from the SES Solar Two requiring off-site disposal would be far less than staff's threshold of significance and would therefore not significantly impact the capacity or remaining life of the Class I waste facilities. Similar to the proposed project, the project would need to implement a comprehensive program to manage hazardous wastes and obtain a hazardous waste generator identification number (required by law for any generator of hazardous wastes).

Comparison to Proposed Project. The environmental impacts of waste disposal at the Agricultural Lands Alternative site would be similar to those at the proposed SES Solar Two site at Plaster City.

Worker Safety and Fire Protection

Environmental Setting. The Agricultural Lands Alternative site is located within an area that is primarily agricultural. The area is currently served by the Imperial County Fire Department located at the airport in the City of Imperial, approximately 10 miles north of the site. Mutual aid service for police and fire emergencies is available from Brawley and El Centro. See the **Worker Safety and Fire Protection** section for more information regarding the Imperial County Fire Department. As with the proposed site, the fire risks of this alternative would be low as the site would be managed for vegetation control and would be adjacent to areas of active agriculture use that are frequently irrigated, and do not gather large amounts of fire fuel.

Environmental Impacts. Similar to the proposed SES Solar Two project, it would be appropriate for a solar plant at the Agricultural Lands Alternative site to provide a Project Demolition and Construction Injury and Illness Prevention Program and a Project Operations Safety and Health Program in order to ensure adequate levels of industrial safety. The applicant would also be required to provide safety and health programs for project construction, operation, and maintenance. As with the proposed project, the Imperial County fire department would be contacted to assure that the level of staffing, equipment, and response time for fire services and emergency medical services are adequate.

Comparison to Proposed Project. Staff concludes that the environmental impact of worker safety and fire protection at the Agricultural Lands Alternative site would be similar to that at the proposed Solar Two site at Plaster City.

Engineering Assessment for Agricultural Lands Alternative

Facility Design

The project's design at the Agricultural Lands Alternative site would be similar to that of SES Solar Two at the Plaster City site, although it would require longer transmission collector systems and would be potentially constrained by the limited acreage available. However, the project at the Agricultural Lands Alternative site would not be required to avoid desert washes as at the Plaster City site. As with the proposed site, staff-recommended measures may be appropriate to ensure compliance with engineering laws, ordinances, regulations, and standards applicable to the design and construction of the project.

Geology, Paleontology and Minerals

Environmental Setting. As with the Mesquite Lake Alternative site, the Cahuilla Lake Beds underlie the Agricultural Lands Alternative site. The Mesquite Lake Alternative analysis provides detailed information regarding the Cahuilla Lake Beds.

The Agricultural Lands Alternative site is located within five miles of the Yuha Wells Fault, and within 20 miles of the Laguna Salada Fault and the Imperial Fault (CPUC 2008). In accordance with the Alquist-Priolo Earthquake Fault Zoning Act (Chapter 7.5 of Division 2, California Public Resources Code), the Office of State Geologist has delineated Special Study Zones, which encompass potentially and recently active traces of major faults, including the Imperial Fault (Imperial County 2006). Estimated peak

ground acceleration for this area is between 0.4g to 0.6 g (CPUC 2008). No mineral resources have been identified.

Environmental Impacts. Seismic ground shaking is probable at this alternative site because it is located within 20 miles of the Yuha Wells Fault, the Laguna Salada Fault, and the Imperial Fault. The severity and frequency of ground shaking associated with earthquake activity at the Agricultural Lands Alternative site is expected to be similar to that of the proposed Plaster City site. As such, similar design criteria would be required for the Agricultural Lands Alternative site in accordance with a design-level geotechnical report and California Building Code (2007) standards. Adequate design parameters for the facility would need to be determined through a site-specific evaluation by a Certified Engineering Geologist or Geotechnical Engineer. Impacts due to seismic hazards and soil conditions, such as subsidence, would be addressed by compliance with the requirements and design standards of the California Building Code. The potential for liquefaction in this area is low due to anticipated depths of groundwater; however, the water table may rise temporarily and sections of the Agricultural Lands Alternative site are adjacent to active river washes. As such the alternative site may be moderately susceptible to liquefaction if a strong earthquake occurs while the valley floor sediments are saturated.

The paleontological sensitivity and potential to encounter significant paleontological resources in Lake Cahuilla Beds at this alternative site and the Plaster City site is similar. As stated in the **Geology, Paleontology, and Minerals** section, construction of the proposed project will include grading, foundation excavation, utility trenching, and possibly drilled shafts. There exists the probability of encountering paleontological resources. As with the Plaster City site, the proposed Conditions of Certification are designed to mitigate any paleontological resource impacts to a less-than-significant level.

Comparison to Proposed Project The Agricultural Lands Alternative site is subject to a similar risk of geologic hazards as the proposed SES Solar Two site. Strong ground shaking would be effectively mitigated through facility design. The potential to encounter geologic resources and significant paleontological resources at the alternative site is similar to the Plaster City site. The Conditions of Certification provided in the **Geology, Paleontology and Minerals** section would be applicable to the Agricultural Lands Alternative site.

Power Plant Efficiency

The plant configuration and Stirling Engine technology that would be employed at the Agricultural Lands Alternative site would be similar to the proposed project, which means it would result in similar consumption of fuel, and it would result in a similar level of efficiency.

Power Plant Reliability

The plant configuration at the Agricultural Lands Alternative site would be similar to the proposed project, which means it would result in similar levels of equipment availability. Plant maintainability, fuel and water availability, and reliability of the plant in relation to natural hazards would each be similar at this alternative site to the proposed project.

Transmission System Engineering

Locating a solar facility at the Agricultural Lands Alternative site would require longer connector lines than at the proposed SES Solar Two site. Once collected, the power would interconnect with the Imperial Valley Substation. As such, the transmission system evaluation for the Agricultural Lands Alternative site would be similar to that of the SES Solar Two solar facility at the Plaster City site.

Summary of Impacts – Agricultural Lands Alternative

The Agricultural Lands Alternative site would have impacts similar to the proposed SES Solar Two site at Plaster City for 11 of the 20 environmental and engineering resource elements: air quality, public health, socioeconomics, traffic and transportation, waste management, worker safety and fire protection, facility design, geology, paleontology and minerals, power plant efficiency, power plant reliability, and transmission system engineering.

The SES Solar Two site is preferred over the Agricultural Lands Alternative site for four resource elements: hazardous materials, land use, noise, and transmission line safety and nuisance.

The Agricultural Lands Alternative site would be preferred to the proposed SES Solar Two site at Plaster City for five resources: biological resources, cultural resources, recreation, soils and water resources, and visual resources.

B.2.7.3 SOUTH OF HIGHWAY 98 ALTERNATIVE

The South of Highway 98 Alternative site is located on federally owned land that is designated as BLM land, but it was withdrawn from BLM management by the Bureau of Reclamation in 1928. When federal lands are withdrawn from the public domain they become administered by, and are under the jurisdiction of, an agency whose specific needs and purposes take precedent over other land uses. However, the Memorandum of Agreement between the Bureau of Reclamation and the BLM states that the Bureau of Reclamation administers all Reclamation withdrawn lands on which there are authorized or constructed Reclamation projects (DOI 1981). BLM may provide assistance with managing Bureau of Reclamation-withdrawn lands by providing law enforcement and overseeing any allowed recreational uses (DOI 1981). The BLM administers all other Bureau of Reclamation withdrawn lands which are not within the boundaries of national forests or under other agency administration (DOI 1981).

The South of Highway 98 Alternative site area was recently identified by the BLM and DOE for in depth study for solar development in Solar PEIS (BLM 2009d).

The South of Highway 98 Alternative site is located near existing infrastructure and is crossed by an existing 500 kV transmission line. See **Alternatives Figure 5** for a depiction of the South of Highway 98 Alternative site. The South of Highway 98 Alternative site is located approximately four miles southeast of the greater El Centro region. Highway 98 is the northern border of the alternative site and the United States/Mexico border creates the southern border of the site.

Approximately 5,000 acres south of Highway 98 have appropriate solarity and less than 5% slope, as evidenced by the RETI data and the adjacent solar project application (CACA 050174) on land surrounding the All-American Canal (BLM, 2009). The South of Highway 98 Alternative site has elevation ranging between 115 and 360 feet above sea level. It is accessible via I-8 and Highway 98.

The alternative site is located immediately south of Highway 98 between the Lake Cahuilla-D ACEC and three miles east of the intersection of SR 98 and I-8 and would surround the BLM Tamarisk Long Term Visitor Area (LTVA) campground. It is located both north and south of the All-American Canal.

At 5,000 acres, the South of Highway 98 Alternative site does not have the same acreage as the proposed project (6,500 acres), which would accommodate a 750 MW solar power plant. However, this alternative site is considerably flatter than the proposed site, so it is possible that this site could be used more efficiently than the proposed Plaster City site, allowing generation of 750 MW within a smaller space. Alternatively, this site could be combined with land areas identified in other alternative sites such as the Mesquite Lake or Agricultural Lands Alternatives sites, described above.

The land uses in the immediate area of the alternative site area are open space, public land and infrastructure. The nearest town is Calexico, California (estimated population 38,344 in 2008) approximately 16 miles west of the South of Highway 98 Alternative (United States Census 2009). The IID Garrison Camp is located approximately 0.5 mile west of this alternative site; this is a small residential area for IID employees working at generation facilities along the canal.

Water for the South of Highway 98 Alternative would be acquired from the Seeley Waste Water Treatment Facility and would require an approximately 38-mile pipeline to reach this alternative site.

It is assumed that the same number of construction and operation workers would be required for the South of Highway 98 Alternative as for the proposed site, approximately 731 at peak construction and 164 during operation. It is likely that the construction workers would use lodging in either El Centro or Calexico, approximately 27 and 16 miles west of the project, respectively.

Transmission Interconnection. It is assumed that the project at this alternative site would require construction of an electrical substation that would connect to the existing Imperial Valley Substation via a new overhead 230 kV transmission line. This transmission interconnection would follow the existing SWPL ROW east for approximately 30 miles until reaching the Imperial Valley Substation. This transmission line is substantially longer than the 10-mile line required for the proposed project at the Plaster City site.

Environmental and Engineering Assessment of the South of Highway 98 Alternative

Air Quality

Environmental Setting. Each local air quality district in California establishes its own significance criteria for environmental review of projects based on the specific

conditions within each air basin. Like the proposed SES Solar Two site, the South of Highway 98 Alternative site is would be located within the Salton Sea Air Basin, regulated by the Imperial County Air Pollution Control District (ICAPCD). The South of Highway 98 Alternative site is located approximately sixteen miles from Calexico and immediately adjacent to the United States/Mexico border. The California-Mexico border region is characterized by air quality conditions that tend to be worse than elsewhere in the County. Imperial County (Calexico) persistently violates ambient air quality standards for PM10 and CO. Calexico is the only area of the State that does not meet the CO standards, apparently due to motor vehicle emissions and pollution transported from Mexico (CARB, 2006a). More specific information regarding the Salton Sea Air Basin and ICAPCD can be found in the **Air Quality** section of this SA/DEIS.

Environmental Impacts. Air quality impacts would principally consist of exhaust emissions from heavy-duty diesel and gasoline-powered construction equipment (*e.g.,* ozone precursors, NOx and VOC; other criteria pollutants, such as CO and PM10; and toxic diesel particulate matter emissions) and fugitive particulate matter (dust) from travel on unpaved surfaces. These emissions are described for the proposed project and would be essentially the same at any site.

Exhaust emissions would also be caused by workers commuting to and from the work sites, from trucks hauling equipment and supplies to the sites, and crew trucks (e.g., derrick trucks, bucket trucks, pickups). Because of the remoteness of the site, workers and trucks hauling equipment and supplies would have to commute 27 miles (to El Centro) or 140 miles (to San Diego) to reach the South of Highway 98 Alternative site. The proposed SES Solar Two site is located about 20 miles from El Centro and 120 miles to San Diego.

Emissions from the construction and operation of a 750 MW solar project at the South of Highway 98 Alternative would need to be controlled to satisfy the air permitting requirements of the ICAPCD. As such, construction and operation of the SES Solar Two project at the South of Highway 98 Alternative site would be subject to permit requirements, and it would require Energy Commission mitigation, similar to that of the proposed project, to avoid adverse air quality impacts. Appropriate mitigation at the South of Highway 98 Alternative site would likely involve similar, locally oriented recommendations such as the Conditions of Certification presented in the **Air Quality** section of this SA/DEIS to reduce PM10 and CO impacts.

Comparison to Proposed Project. The construction emissions resulting from building a 750 MW solar power plant at the South of Highway 98 Alternative site would be similar to the construction emissions for the SES Solar Two project at the proposed location. The South of Highway 98 Alternative would have slightly higher commute emissions as it is located further from housing options. Operational emissions from the South of Highway 98 Alternative would be similar to those of the proposed SES Solar Two site.

Biological Resources

Environmental Setting. As with the Mesquite Lake and Agricultural Lands Alternatives sites, the South of Highway 98 Alternative site is located in the Imperial Valley in the Colorado Desert bioregion. Details regarding the general biological diversity of the

Colorado Desert can be found in the biological resources assessment provided earlier for the Agricultural Lands Alternative site.

The South of Highway 98 Alternative site is located on partially disturbed lands. The site is crossed by the concrete-lined All-American Canal and the existing SWPL 500 kV transmission line ROW. Dirt roads/off-road vehicle (ORV) trails are present alongside the canal, as well as other areas on site. Undeveloped lands occur to all sides, with the exception of I-8 to the north. The primary land cover of this alternative site is desert scrub, dunes and arid wetlands dominated by arrow weed (*Pluchea sericea)* and salt cedar (*Tamarix* sp.) (SES 2009n). Seepage from the All-American Canal influences the local vegetation cover; the current vegetation cover will likely change over time as the canal has been recently concrete-lined to conserve water (SES 2009n).

Sonoran desert scrub on site is comprised primarily of varying densities of creosote bush (*Larrea tridentata*), white bur-sage (*Ambrosia dumosa*), ephedra (*Ephedra* sp.), alkali goldenbush (*Isocoma acradenia*), buckwheat (*Eriogonum* sp.), Sahara mustard (*Brassica tournefortii*), and Mediterranean grass (*Schismus barbatus*). Arrowweed scrub is dominated by arrowweed (*Pluchea sericea*) and tamarisk (*Tamarix* sp.), and likely established as a result of water seepage from the canal, prior to it being lined. Stabilized sand dunes support species found in Sonoran desert scrub, in addition to honey mesquite (*Prosopis glandulosa*). Sand dunes and riparian habitat are considered sensitive habitats by the County.

Based on the site reconnaissance and aerial interpretation, past seepage from the All American Canal resulted in the formation of several hundred acres of wetland/riparian habitat on site. Large portions of the site that were historically subject to this seepage appear to have been severed from this water source since the lining of the canal through the site, which has resulted in the die-off of wetland vegetation in some areas. Areas with extant wetland vegetation would be considered potentially jurisdictional to the California Department of Fish and Game (CDFG) and U.S. Army Corps of Engineers (Corps). Because the site is located on federal lands, it would be at the federal government's discretion whether or not to pursue a Streambed Alteration Agreement with CDFG for any potential wetland impacts. In addition, the All American Canal itself may be considered a jurisdictional waterway and also is considered a Significant Natural Area (SNA) in the vicinity of the alternative site, pursuant to the Imperial County General Plan.

The site is used by a variety of common animal species, including coyote (*Canis latrans*), desert cottontail (*Sylvilagus bachmani*), black-tailed jackrabbit (*Lepus californicus*), and various resident and migratory bird species, such as black-tailed gnatcatcher (*Polioptila melanura*), American kestrel (*Falco sparverius*), and Gambel's quail (*Callipepla gambelii*). The canal supports year-round flows and is used by migratory waterfowl as well as resident species such as American coot (*Fulica americana*) and great blue heron (*Ardea herodias*). Several small burrows (0.5" to 2") were noted during the reconnaissance survey, many of which were inactive. The burrows are likely used by kangaroo rats, lizards, and snakes.

Although not observed during the biological reconnaissance, CNDDB species records for the site include one listed species: the federally endangered (FE) and state

threatened (ST) Yuma clapper rail (*Rallus longirostris yumanensis*), and two California species of special concern (SSC): flat-tailed horned lizard (*Phrynosoma mcallii*) and Yuma hispid cotton rat (*Sigmodon hispidus eremicus*). Two non-listed sensitive plant species: sand food (*Pholisma sonorae*; California Native Plant Society [CNPS] List 1B.2), and giant Spanish needle (*Palafoxia arida* var. *gigantean*; CNPS List 1B.3) have been documented off site to the east, and critical habitat for the federally threatened (FT) and state endangered (SE) Peirson's milk-vetch (*Astragalus magdalenae* var. *peirsonii*) occurs approximately six miles to the northeast.

Alternatives Table 6 lists the sensitive species near the South of Highway 98 Alternative site.

Alternatives Table 6
California Natural Diversity Database Records for Sensitive Species Within 5 Miles of the South of Highway 98 Alternative Site

Common Name / *Scientific Name*	Status State/Fed/CNPS/BLM	Occurrence Within 5 Miles of the South of Highway 98 Alternative Site
Sand food *Pholisma sonorae*	--/--/1B/--	Occurs within one mile east of the site.
Giant Spanish-needle *Palafoxia arida* var. *gigantea*	--/--/1B/BLMS	Occurs within one mile east of the site.
Yuma clapper rail *Rallus longirostris yumanensis*	ST/FE/--/--	Occurs approximately five miles northeast of site.
Yuma hispid cotton rat *Sigmodon hispidus eremicus;*	SSC/--/--/--	Occurs within the site.
Flat-tailed horned lizard *Phrynosoma mcallii*	SSC/--/--/BLMS	Occurs within one mile north of the site.

Source: SES 2009n.

STATUS CODES:

Federal FE = Federally listed endangered: species in danger of extinction throughout a significant portion of its range
FT = Federally listed, threatened: species likely to become endangered within the foreseeable future
BCC: Fish and Wildlife Service: Birds of Conservation Concern: Identifies migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent highest conservation priorities <www.fws.gov/migratorybirds/reports/BCC2002.pdf>

State SE = State listed, endangered
ST = State listed as threatened
SSC = Species of special concern
WL = State watch list

California Native Plant Society
List 1B = Rare, threatened, or endangered in California and elsewhere
List 2 = Rare, threatened, or endangered in California but more common elsewhere
List 3 = Plants which need more information
List 4 = Limited distribution – a watch list
0.1 = Seriously threatened in California (high degree/immediacy of threat)
0.2 = Fairly threatened in California (moderate degree/immediacy of threat)
0.3 = Not very threatened in California (low degree/immediacy of threats or no current threats known)

BLM: Sensitive: Bureau of Land Management
BLM Manual § 6840 defines sensitive species as "…those species that are (1) under status review by the FWS/NMFS; or (2) whose numbers are declining so rapidly that federal listing may become necessary, or (3) with typically small and widely dispersed populations; or (4) those inhabiting ecological refugia or other specialized or unique habitats." <www.blm.gov/ca/pdfs/pa_pdfs/biology_pdfs/SensitiveAnimals.pdf>

Sensitive Species

Following are descriptions of the sensitive species habitat in the vicinity of the alternative site (SES 2009n).

- **Sand food** is a parasitic perennial herb that occurs in sandy areas and blooms between April and June.
- **Giant Spanish needle** is an annual or becoming perennial herb that is found in desert sand dunes at 15 to 100 meters. It blooms February to May.
- **Yuma clapper rail** see Mesquite Lake Alternative biological setting for details.
- **Yuma hispid cotton rat** habitat includes dense grassy areas such as fields and along roadside edges, brushy or weedy areas among weeds and cattails along the Colorado River and streams or ponds, in irrigated fields, and desert scrub.
- **Flat-Tailed Horned Lizard (FTHL)** see Mesquite Lake Alternative biological setting for details.

The site has moderate to high potential to support sand food and giant Spanish needle in the stabilized sand dune habitat. The following animal species have high potential to occur on site: foraging golden eagles (*Aquila chrysaetos*; Fully Protected [FP]) and prairie falcons (*Falco mexicanus*; SSC), Le Conte's thrasher (*Toxostoma lecontei*; SSC), Yuma clapper rail, Yuma hispid cotton rat, and American badger (*Taxidea taxus*; SSC). Burrowing owl (*Athene cunicularia*; SSC) has moderate potential to occur on site.

Environmental Impacts

Construction

Approximately 5,000 acres of desert scrub, dunes, and arid wetlands would be permanently lost at this alternative site, as a result of vegetation clearing, grading, and construction of the solar facilities, potentially affecting special status animal species. Impacts to listed or sensitive plant species would result from direct or indirect loss of known locations of individuals or direct loss of habitat. Indirect loss of individuals may occur in instances such as sediments transported (e.g., from cleared areas during rain events) that cover adjacent plants or changes in a plant's environment that cause its loss (e.g., adjacent shrubs that provided necessary shade are removed). Additional impacts would occur due to the construction and operation of linear facilities associated with a solar facility at the South of Highway 98 Alternative site, including a possible transmission line approximately 30 miles long that would cross FTHL habitat and disturbed agricultural land.

Impacts/Mitigation to Wildlife. Building a solar facility at the South of Highway 98 Alternative site would primarily impact desert scrub. Impacting desert scrub would potentially have an adverse effect on listed and sensitive wildlife species and their habitats either directly or through habitat modifications, especially on the Yuma hispid cotton rat and Yuma clapper rail both of which have been documented at the South of Highway 98 Alternative site. Any wildlife residing within this site would potentially be displaced, injured, or killed during project activities. Animals could fall into construction trenches, be crushed by construction vehicles or equipment, or be harmed by project

personnel. In addition, construction activities may attract predators or crush animal burrows or nests.

Migratory/Special Status Bird Species. Desert scrub provides foraging, cover, and/or breeding habitat for migratory birds, including special-status bird species that may be present at the site. Project construction and operation could impact nesting birds in violation of the Migratory Bird Treaty Act. Preconstruction surveys and avoidance of nesting birds would reduce such impacts.

Spread of Noxious Weeds. Construction of a solar facility at the South of Highway 98 Alternative site could result in the introduction and dispersal of invasive or exotic weeds. The permanent and temporary earth disturbance adjacent to native habitats increases the potential for exotic, invasive plant species to establish and disperse into native plant communities, which leads to community and habitat degradation. A weed reduction program would potentially reduce and mitigate impacts.

Noise. Noise from construction activities could temporarily discourage wildlife from foraging and nesting immediately adjacent to the project area. Many bird species rely on vocalization during the breeding season to attract a mate within their territory. Noise levels from certain construction, operations, and demolition activities could reduce the reproductive success of nesting birds.

Operational Impacts

Operation of a 30-mile transmission line could result in increased avian mortality due to collision with new transmission lines. Mitigation could include installing the transmission line in accordance with the Avian Powerline Interaction Committee (APLIC) Guidelines designed to minimize avian-power line interactions.

Definite conclusions about the potential for significant impacts to biological resources cannot be made in the absence of site-specific survey and project design information.

Comparison to Proposed Project. This alternative supports stabilized sand dunes, riparian/wetland habitat, and Sonoran desert scrub. The sand dune and riparian/wetland habitat are County-sensitive vegetation communities (County 2005). Furthermore, the riparian/wetland habitat has CNDDB records for one listed animal species (Yuma clapper rail) and one California species of special concern (Yuma hispid cotton rat), and the habitat itself would be jurisdictional to CDFG and potentially to the Corps. Much like the proposed SES Solar Two site, this alternative supports potential habitat for flat-tailed horned lizard and burrowing owl, as well as moderate potential for various rare plant species. This alternative has overall greater biological sensitivity than the proposed site, due to the presence of riparian habitats and CNDDB records of a listed species.

Cultural Resources

Environmental Setting. The South of Highway 98 Alternative site is located on desert scrub lands in Imperial County. The alternative site is located in the ancient Lake Cahuilla region. Detailed information regarding the formation of Lake Cahuilla and its history can be found under the **Cultural Resources** section of this SA/DEIS for the proposed project or above for the Mesquite Lake Alternative site. The western border of the South of Highway 98 Alternative site would be adjacent to the Lake Cahuilla-D

ACEC which was designated to recognize and protect the significant cultural resources found along the eastern edge of the ancient shoreline of Lake Cahuilla.

The predominant evidence of human occupation in Imperial County during the Late Prehistoric Period is located along the ancient shoreline at approximately 12 meters (40 feet) above mean sea level and is exemplified by ceramic and lithic artifact scatters associated with rock rings and fish traps (CPUC 2008). Trails used by Native Americans as well as Spanish, Mexican, and American Period explorers are still evident in portions of Imperial Valley and are typically associated with known water sources.

The Imperial County General Plan EIR identifies the South of Highway 98 Alternative site as having a moderate to light sensitivity for cultural resources. A cultural resources records search was conducted in 2009 for the South of Highway 98 Alternative site which identified a total of 51 previously recorded cultural resources sites as shown in **Alternatives Table 7**. The records search indicated 26 of the previously documented sites could not be relocated during surveys conducted in 2003. The sites include:

- 5 historic sites
- 24 ceramic sites
- 2 temporary campsites
- 1 trail
- 10 lithic scatters
- 1 milling station
- 1 combination of ceramics and lithics
- 2 trails and ceramics
- 1 unknown origin
- 4 sites located on the map but with site forms missing

Lithic scatters did not include temporally diagnostic artifacts or features, the ceramics could not be attributed to specific, identifiable, temporal or cultural affiliation beyond association with the Late Prehistoric (SES 2009n).

Alternatives Table 7
Cultural Resources – South of Highway 98 Alternative Site

Resource	Description	Resource	Description
IMP-7130H	Historic – All-American Canal	IMP-8909	Site form missing
IMP-3127	Ceramic, pot scatter 20 sherds	IMP-853	Temporary camp, 3 cleared circles
IMP-873	Trail, exact location unknown	IMP-8490	Ceramics, pot drop of 22 black mesa buff sherds
IMP-8969	Historic, refuse dump with household wares, food remains, burned materials	IMP-1031	Lithic Scatter, anvil, hammer, 48 pieces of quartz
IMP-3798	Lithic, single tool	IMP-3799	Lithic Scatter, 1 flake, 1 core
P-13-008935	Ceramic, 1 Tumco buffware sherd	IMP-3056	Ceramics, 6 potsherds
IMP-974	Temporary camp, random tools	IMP-630/656	Site form missing
IMP-3801H	Historic, Debris scatter of 1920-1930 range	IMP-3802	Ceramic, Pottery scatter
IMP-3803	Lithic, Core	IMP-3804	Historic, Isolated glass insulator
IMP-3800	Lithic, Isolated basalt core	IMP-786	Milling station, bedrock milling with pottery, tools, flakes
IMP-530	Ceramic & lithic, ceramics and manos	IMP-8934	Site form missing

Resource	Description	Resource	Description
IMP-3129	Ceramic, 5 Salton buffware sherds	IMP-3130	Ceramic, 2 Colorado buffware sherds
IMP-3649H	Historic, communication site	IMP-3317	Site form missing
IMP-1390	Ceramic, potsherds	IMP-1391	Ceramic, potsherds
IMP-3125	Lithic scatter	IMP-3048	Ceramic, 8 potsherds
IMP-3049	Lithic, Isolated chert flake	IMP-4243	Lithics, Isolates flakes
IMP-3126	Ceramics, 20 potsherds	IMP-3805	Ceramic, Isolated rim sherd
IMP-1392	Ceramics, 3 potsherds	IMP-1393	Ceramics, Potdrop
IMP-3052	Ceramics, 28 potsherds	IMP-3053	Trail and Ceramics, prehistoric trail and scattered sherds
IMP-3054	Ceramics, 38 potsherds	IMP-3055	Trail and Ceramics, 1500' long trail segment and scattered potsherds
IMP-3049	Lithic, Isolated chert flake	IMP-3124	Ceramics, Isolated potsherd scatter
IMP-3123	Ceramics, Isolated potsherd scatter	IMP-1394	Ceramic, Isolated potsherd
IMP-4238	Ceramics, 30 buffware potsherds	IMP-4239	Ceramics, Potdrop of 74 sherds
IMP-4240	Ceramic, Isolate	IMP-4241	Lithic, Isolated scraper
P13-008519/IMP-7950H	Historic – Experimental Farm #1	IMP-4242	Ceramics, 6 potsherds
IMP-829	Unknown	IMP-8334	Ceramic, 60 Tumco buff sherds
IMP-530/656	Unknown	IMP-233	Trail
IMP-1031	Site form missing		

Source: SES 2009n.

Environmental Impacts

Fifty-one known archaeological, architectural, or historical sites would potentially be affected by construction and operation of a solar facility at the South of Highway 98 Alternative site. Conditions of Certification such as those required for the SES Solar Two project at Plaster City in the **Cultural Resources** section of this PSA/DEIS may reduce this impact; however, specific site surveys would be required to be certain.

Unknown, unrecorded cultural resources may be found at the South of Highway 98 Alternative site associated with the lower elevation recessional shorelines of Lake Cahuilla. As they are discovered, resources would be recorded and information retrieved. If the nature of the resource requires it, the resource would be protected. When discovered, cultural resources would be treated in accordance with applicable federal and state laws and regulations as well as the mitigation measures and permit requirements applicable to a project. Should resources be discovered during construction of current and future projects, they would be subject to legal requirements designed to protect them.

Comparison to Proposed Project The South of Highway 98 Alternative site has been disturbed previously in some areas due to the construction, operation, and maintenance

of the All-American Canal. This disturbance may result in a lower probability for undisturbed cultural resources than at the SES Solar Two Plaster City site. Additionally, the Imperial County General Plant EIR identifies a lower cultural resource sensitivity for the South of Highway 98 Alternative site (identified as moderate to light sensitivity), than for the SES Solar Two proposed site (identified as very sensitive). However, without more site-specific information about cultural resources at the South of Highway 98 Alternative site, no more detailed comparisons are possible.

Hazardous Materials

Environmental Setting. The topography of the South of Highway 98 Alternative site is essentially flat, as are the immediately surrounding areas. The Imperial Irrigation District Garrison Camp is located approximately 0.5 miles west of the South of Highway 98 alternative, next to the Highline Substation. Additionally, the site would surround the Tamarisk Long-Term Visitor Area. The camping area is open September 15 through April 15 (BLM 1998a)

Access to the South of Highway 98 Alternative site would likely be via I-8 to exit 143, Highway SR 98. Access roads to the site would need to be built, including a bridge across the All-American Canal. Alternately, the Herman Schneider Jr. Bridge could be used to cross the canal; however, this would require longer access roads to reach this alternative site. Transport of hazardous materials would be primarily through agricultural land and designated BLM open space via I-8.

Environmental Impacts. Hazardous materials use at the South of Highway 98 Alternative site, including the quantities handled during transportation and disposal, would be the same as those of the proposed project. As stated in the **Hazardous Materials** section for the proposed project, hazardous materials used during the construction phase of the project would include gasoline, diesel fuel, motor oil, lubricants, and small amounts of solvents and paint. No acutely toxic hazardous materials would be used on site during construction, and none of these materials pose a significant potential for off-site impacts as a result of the quantities on site, their relative toxicity, their physical states, and/or their environmental mobility.

Hydrogen gas would be produced on site through electrolysis by one hydrogen generator. Hydrogen is identified as a hazardous substance based on its flammable characteristics. Although the project would not be subject to State or federal requirements for hydrogen storage, SES conducted an Offsite Consequence Analysis for the project and considered four worst-case scenarios. In the event of the worst case scenario induced from cumulative releases at the site, the maximum impacted distance is 0.13 mile (SES 2009q). As the South of Highway 98 Alternative site would have sensitive receptors within 0.13 mile, at the Tamarisk LTVA, the release of hydrogen could pose a significant impact. Conditions of Certification and compliance with applicable LORS would reduce this impact.

Transportation of hazardous materials to the South of Highway 98 Alternative site would be primarily on I-8 and Highway 98. The impacts from transportation of hazardous material would be similar as for the proposed Plaster City site.

Comparison to Proposed Project. The hazardous materials that would be used at the South of Highway 98 Alternative site would be the same as those used at the proposed

SES Solar Two site; both the South of Highway 98 Alternative site and the proposed site have sensitive subgroups within a five-mile radius. With adoption of the proposed Conditions of Certification, the South of Highway 98 Alternative would comply with all applicable laws, ordinances, regulations, and standards (LORS) and result in no significant impacts to the public.

The South of Highway 98 Alternative would potentially result in greater impacts from hydrogen storage at the facility because of the proximity between the alternative site and the Tamarisk LTVA. Conditions of Certification could be required such that the hydrogen storage tank was placed at least 0.13 mile from the LTVA.

Land Use

Environmental Setting. The South of Highway 98 Alternative site is located on federally owned, Bureau of Reclamation withdrawn lands. When federal lands are withdrawn from the public domain they become administered by, and are under the jurisdiction of, an agency whose specific needs and purposes take precedent over other land uses. However, the Memorandum of Agreement between the Bureau of Reclamation and the BLM states that the Bureau of Reclamation administers all Reclamation withdrawn lands on which there are authorized or constructed Reclamation projects (DOI 1981). The BLM administers all other Bureau of Reclamation withdrawn lands which are not within the boundaries of national forests or under other agency administration (DOI 1981). The project would need to be consistent or compatible with the Bureau of Reclamation withdrawal. As the South of Highway 98 Alternative site has been identified by the BLM and DOE for in depth study for solar development in Solar PEIS, it is assumed that the project would potentially be compatible with the Bureau of Reclamation withdrawal.

The BLM Multiple Use Classification for this land is Limited. Multiple Use Class L is designed for the protection of sensitive, natural, scenic, ecological, and cultural resource values (BLM 1999). Public lands designated as Class L are managed to provide for generally lower intensity, carefully controlled multiple use of resources, while ensuring that sensitive values are not significantly diminished. The CDCA plan identifies solar facilities as permitted uses on Multiple-Use Class L lands after NEPA requirements are met. A portion of this land has been identified by the BLM as a Solar Energy Study Area 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.

Agriculture. The South of Highway 98 Alternative site is not used for agricultural purposes; however, it would require an approximately 30-mile transmission line to reach the Imperial Valley Substation. This would include crossing approximately 26 miles of agricultural lands. Generally, tubular steel poles are used to cross agricultural lands. These poles have a permanent disturbance area of approximately 64 square feet, and a span length of 700 to 900 feet or 7 to 10 structures per linear mile (CPUC 2008). As such, approximately 182 to 260 pole structures would be required to reach the Imperial Valley Substation representing a total permanent loss of less than 0.5 acre of farmland.

Aerial spraying (i.e., crop dusting) is used to control insects, weeds, and diseases that may affect crops in the Imperial Valley. Aerial spraying occurs in those areas of the Imperial Valley actively cultivated with field crops. Aerial applicators fly at low elevations

and sometimes at speeds in excess of 100 miles per hour. Fatalities associated with aerial applicators can partly be attributed to flying at low altitudes and high speeds, as well as the presence of obstacles such as power lines, trees, towers, or buildings within the flight area (CPUC, 2008). Where transmission lines exist in an agricultural area, pilots must fly over, beside, and (occasionally) under the lines to complete aerial spraying activities. Transmission lines and towers thus present a substantial obstacle to be avoided, and require additional attention from the pilots. Because the new transmission line would be located immediately adjacent to the existing 500 kV SWPL transmission line, the impact to aerial spraying would be minimal.

Sensitive Receptors. The Tamarisk Long Term Visitor Area (LTVA) would be surrounded by solar facilities if the Solar Two project is constructed on this alternative site. Visitors may stay at the LTVA between September 15 and April 15 with a long term permit. Visitors to the LTVA are allowed to remain up to 14 days of any 28-day period between April 16 and September 14. The Tamarisk LTVA has minimal facilities and allows only self-contained camping units. In 2009, 13 short-term permits and 2 long-term permits were issued for the LTVA.

Transmission Interconnection. As stated above, the South of Hwy 98 alternative would require approximately 30 miles of new 230 kV transmission line to reach the Imperial Valley Substation. The route would cross approximately 3.5 miles of BLM land before entering the substation. This land is part of the CDCA. The Energy Production and Utility Corridor Element of the CDCA Plan established a network of joint-use planning corridors intended to meet the projected utility service needs at the time the Plan was written. The transmission line would be developed on BLM land within the CDCA planning area designated utility corridor N; therefore a Plan Amendment would not be required for this transmission facility.

Environmental Impacts. The South of Highway 98 Alternative would be located on land under the jurisdiction of both the BLM and the BOR, which is partially disturbed and is currently being considered as a Solar Energy Study Area. Like the proposed SES Solar Two site, a key land use plan affecting this project is the BLM CDCA Plan of 1980, as amended. The South of Highway 98 Alternative site, as stated above, is located within areas of the CDCA that are designated Multiple-Use L. The CDCA Plan identifies solar facilities as permitted use on Multiple-Use L lands after NEPA requirements are met.

There are no agricultural uses or properties within one mile of this alternative site. Neither the construction nor operation of the proposed project would result in any impacts to existing agricultural operations or foreseeable future agricultural use; however, the transmission interconnection would result in the permanent loss of approximately 0.5 acres of active farmland and potential impacts to aerial spaying.

As with the proposed SES Solar Two site, the South of Highway 98 Alternative would not physically divide an established community because the solar facility site and linear features would be located on undeveloped federal property in unincorporated Imperial County and would not be located within or near an established community.

Seasonal partial-year LTVA occupants would be impacted by the proposed project if it were built at the South of Highway 98 Alternative site. The South of Highway 98

Alternative site would not directly impact any residences. Construction activities for the alternative would create temporary disturbance to the LTVA occupants (i.e., heavy construction equipment on temporary and permanent access roads and moving building materials to and from construction staging areas). Conditions of Certification to reduce noise and air quality impacts are presented in the Noise and Air Quality sections for the proposed SES Solar Two site. Because this disturbance would be temporary at any one location, the impacts would likely be less than significant.

Comparison to Proposed Project. Selecting the South of Highway 98 Alternative site would result in similar impacts to land use as would occur with the SES Solar Two Plaster City site. However, impacts would occur to temporary occupants of the Tamarisk LTVA. The South of Highway 98 site would be located on some land identified by the BLM as Solar Energy Study Area and potentially appropriate for designation as solar energy zones in the future. Similar Conditions of Certification as those proposed for the SES Solar Two site would be required for the solar project on this alternative site.

Recreation and Wilderness

Environmental Setting. The South of Highway 98 Alternative site is located on BLM/BOR lands adjacent to the All-American Canal and surrounds the Tamarisk LTVA.

The South of Highway 98 Alternative site is located approximately four miles west of the Imperial Sand Dunes Recreation Area, including the Dune Buggy Flats and Grays Well campgrounds. The Imperial Sand Dunes Recreation Area is actively used for off-highway vehicles and camping. Approximately 92,000 permits for use of that recreation area were sold in 2007 (SF 2008).

Environmental Impacts. A solar project at the South of Highway 98 Alternative site would have a direct impact on recreational users at the Tamarisk LTVA, due to the impact on the immediate landscape, construction and operational noise, and overall change to the LTVA setting. Some proportion of recreational users may ultimately prefer to visit other areas due to the industrial views of the SES Solar Two project if located at this alternative site. To mitigate the potential negative effects of the changes to the viewshed, landscaping may be required, or recreational facilities that support these users may be improved or installed.

The distance between the South of Highway 98 Alternative site and the Imperial Sand Dunes Recreation Area may block some views of the project; however, given the elevation of the Sand Dunes Recreation Area, a portion of the project would likely still be visible due to the height of the Stirling engine systems and the overall size of the facility.

Comparison to Proposed Project There are more recreational opportunities near the South of Highway 98 Alternative site than at the proposed Plaster City site because of the extensive use of the Imperial Sand Dunes Recreation Area. However, the project built at this alternative site would directly impact only recreational users at the LTVA. Impacts to recreational users by the South of Highway 98 Alternative would be similar to impacts at the SES Solar Two Plaster City site because of the extensive use of the Plaster City Open Area for OHV purposes and use of the Yuha Basin ACEC.

Noise and Vibration

Environmental Setting. Generally low levels of ambient noise are expected to occur in desert environments. Natural deserts do not exceed 66 dBA, and no desert animal creates sounds above 56 dBA (BLM 2002). However, noise levels would likely be elevated at and adjacent to this alternative site because of the adjacent Highway 98 and I-8, the existing All-American Canal, and off road vehicle use of the Imperial Sand Dunes Recreation Area.

Additional intermittent noise is expected to occur at the northwestern corner of this alternative site where it is located approximately 0.5 mile from the IID Garrison Camp.

Nearby sensitive receptors include the IID Garrison Camp residential community and the visitors to the Tamarisk LTVA. Visitors staying at the LTVA would be within 500 feet of components of the South of Highway 98 alternative.

Environmental Impacts. As stated in the **Noise** section of this SA/DEIS, the construction of the SES Solar Two plant would create noise, or unwanted sound. The character and loudness of this noise, the times of day or night at which it is produced, and the proximity of the facility to sensitive receptors combine to determine whether the facility would meet applicable noise control laws and ordinances and whether it would cause significant adverse environmental impacts.

The South of Highway 98 Alternative site is located in an area that is primarily open space. Rural residences are located northwest of the site within 0.5 mile and visitors to the Tamarisk LTVA would surrounded by the project within 500 feet. As such, they would be subject to unwanted noise, particularly during construction of the project. The nearest permanent sensitive receptors to the proposed site are located 3,300 feet from the project site.

Comparison to Proposed Project. Building the SES Solar Two project at the South of Highway 98 Alternative would create a greater impact than at the Plaster City site because of the closer proximity of sensitive receptors.

Public Health and Safety

Environmental Setting. The South of Highway 98 Alternative site is located in an isolated area. The nearest sensitive receptor is located approximately 500 feet from the project area, at the Tamarisk LTVA.

Environmental Impacts. While the meteorological conditions and topography at the site are not exactly the same as at the proposed Plaster City site, they are similar enough that the results of air dispersion modeling and a human health risk assessment for the South of Highway 98 Alternative site would likely be similar to that found for the proposed site. The cancer risk and hazard indices are much below the level of significance at the point of maximum impact, so the project would be unlikely to pose a significant risk to public health at this location.

Comparison to Proposed Project. There is no significant different between this alternative site and the proposed site for public health.

Socioeconomics and Environmental Justice

Environmental Setting. Like the proposed SES Solar Two site, the South of Highway 98 Alternative site is located in Imperial County. The demographic characteristics of Imperial County are described in the **Socioeconomics and Environmental Justice** section of this SA/DEIS.

Environmental Impacts. Construction workers would most likely be from larger nearby cities such as El Centro, Calexico and San Diego. While there is no housing available in the vicinity of the South of Highway 98 Alternative site, workers could commute from El Centro or Calexico, approximately 16 to 20 miles west of the South of Highway 98 Alternative site. An additional option would be to erect temporary housing in the immediate area of the South of Highway 98 Alternative site; however, this would increase the construction impacts and require provision of additional services such as electricity, water, and food. The Tamarisk LTVA does not have services such as electricity and water. Because it is unlikely that the construction workers would relocate to the immediate vicinity of the South of Highway 98 region, this alternative site would not cause a significant adverse socioeconomic impact on the area's housing, schools, police, emergency services, hospitals, and utilities.

There would be no adverse socioeconomic impacts since most of the construction and operation workforce is within the regional labor market area, and construction activities are short-term. Benefits from the SES Solar Two project, should it be built at the South of Highway 98 Alternative site, are likely to be similar to the benefits from the SES Solar Two project in the Plaster City region. Benefits include increases in sales taxes, employment, and income for Imperial County.

Comparison to Proposed Project. The socioeconomic impacts of the SES Solar Two project at the South of Highway 98 Alternative site would be similar to building and operating the project at the proposed site.

Soil and Water Resources

Environmental Setting. Soils in the South of Highway 98 Alternative site include primarily the Rositas soil series, composed of somewhat excessively drained sand, fine sand, and silt loam, and the Rosita-Superstition soil series, composed of somewhat excessively drained loamy fine sand or fine sand(Imperial County, 1993). These soils are generally characterized by high permeability, slow surface water runoff, and slight erosion hazard. The hazard of soil blowing is high. Approximately 3,000 acres of land on this alternative site would be disturbed by the construction (SES 2008a).

The South of Highway 98 Alternative site lies within the Imperial Subregion of the Colorado River Basin Region 7, east of the Alamo River and east of the Imperial Valley agricultural area. The site is undeveloped desert crossed by the All-American Canal, Highway 98, and the Southwest Powerlink Transmission line. The All-American Canal delivers approximately 3.1 million acre-feet of water annually from the Colorado River to the Imperial Valley. There are no natural watercourses on the project site. Topography is flat and gently sloping toward the west in the direction of the Alamo River.

As with the proposed SES Solar Two site, the South of Highway 98 Alternative site is located outside the service area of the Imperial Irrigation District. As such, reclaimed water for the alternative would be used from the Seeley Waste Water Treatment Facility. A water pipeline approximately 38 miles long would be required to bring water to the South of Highway 98 Alternative site. As with the proposed site, this pipeline could potentially follow Evan Hewes Highway. The applicant has spoken with the Imperial County Department of Public Works and the Imperial County Commissioners Office regarding the use of the Evan Hewes Highway ROW west of the Seeley Waste Water Treatment Facility for a new waterline installation and no concerns were raised (SES 2009q). However, without confirmation from Imperial County, it is unknown whether the Evan Hewes Highway ROW east of the treatment facility would also be available for use for a water pipeline.

Environmental Impacts

Soil Erosion Potential by Wind and Water. As discussed in the **Soils and Water** section of this PSA/DEIS, construction activities can lead to adverse impacts to soil resources including increased soil erosion, soil compaction, loss of soil productivity, and disturbance of soils crucial for supporting vegetation and water-dependent 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 loading to nearby receiving waters. Although access to the site would be from existing roads, construction of the solar dish array would require a substantial construction of local access roads as in the proposed project. While the volume of earth movement required at the alternative site is unknown, the topography and slope of the South of Highway 98 Alternative site are less severe than at the proposed SES Solar Two site.

As at the Solar Two site, grading plans, a Storm Water Pollution Prevention Plan (SWPPP), and a Drainage Erosion and Sediment Control Plan (DESCP) would be required. Due to the flat terrain and existing disturbed condition of this site, the SWPPP and DESCP would likely be sufficient to mitigate soil erosion impacts to a level less than significant.

Project Water Supply. Reclaimed water from the Seeley Waste Water Treatment Facility would be used. The South of Highway 98 Alternative site would require approximately 38 miles of pipeline to reach that treatment facility, 25 miles longer than that required to serve the proposed site. Whether the Evan Hewes Highway ROW east of the treatment facility would be available for use for a water pipeline is unknown at this time.

Wastewater/Storm Water Quality. Storm water runoff from the site during construction and operation could have similar impacts as proposed for the proposed project. The site construction will require a SWPPP which will specify Best Management Practices (BMPs) to minimize or eliminate water contamination. Water quality impacts would likely not be significant.

Sanitary waste disposal would likely be through on-site facilities as for the proposed project. No significant adverse impact is anticipated.

Comparison to Proposed Project. The level terrain lacking in existing drainageways on the South of Highway 98 Alternative results in a lesser Hydrology, Water Use and Water Quality impact for the South of Highway 98 Alternative than for the proposed

project in the area of soil erosion and stream morphology. These impacts, significant for the proposed project, would be avoided in the South of Highway 98 Alternative.

While the Seeley Waste Water Treatment Facility would be able to supply water for the project at the South of Highway SR 98 alternative site, it is uncertain whether the Evan Hewes Highway ROW could be used to bring in that water supply. Water pipeline construction would be substantially greater for the South of Highway 98 Alternative than for the proposed project.

Traffic and Transportation

Environmental Setting. The South of Highway 98 Alternative site is located south of I-8 and Highway 98. Access to this alternative site would be via exit 143 off of I-8, or along Highway 98 itself.

Workers employed to construct the project at this alternative site would most likely commute from El Centro or Calexico (16 miles) or San Diego (140 miles). Given the limited use of I-8 east of El Centro, added traffic on the I-8 would be unlikely to impact the level of service.

It is possible that the Herman Schneider Jr. Bridge could be used cross over the All-American Canal; however, this would require additional access roads to reach the site once south of the canal. A bridge could also be built over the All-American Canal to reach the southern half of the project site.

Environmental Impacts. Before construction could occur at the South of Highway 98 Alternative site, a construction traffic control and transportation demand implementation program would need to be developed in coordination with Caltrans. This analysis may result in the need to limit construction-period truck and commute traffic to off-peak periods to avoid or reduce traffic and transportation impacts. These impacts would likely similar to those of the proposed project as both projects would require the use of I-8 and other smaller roads for access. Highway 98 could also be used to access the South of Highway 98 Alternative site to avoid use of the I-8 during peak periods.

Glare. Similar to the proposed project, there is the potential for highly distracting diffuse glare from the project to affect nearby motorists. Staff developed **CONDITION OF CERTIFICATION VIS-6**, which requires mitigation in the form of physical screening (berms, fencing, landscaping, or similar means) along the length of the project adjacent to Interstate 8. That measure would be adapted to this alternative and would apply to adjacent roadways.

Comparison to Proposed Project. Impacts to traffic and transportation at the South of Highway 98 Alternative site would be similar to those at the proposed SES Solar Two site.

Transmission Line Safety and Nuisance

Environmental Setting. The South of Highway 98 Alternative site would connect with the SDG&E system at the Imperial Valley Substation through a new transmission line that would exit the site along the SWPL ROW and head west for approximately 30

miles. Approximately 26 miles of the new transmission line would cross agricultural land within the Imperial Valley, but the entire new line would parallel the existing SWPL.

The transmission line would be within 500 feet of approximately two residences.

Environmental Impacts. Similar to the proposed project, this alternative site would not be likely to cause transmission line safety hazards or nuisances with implementation of Conditions of Certification such as those described in the **Transmission Line Safety and Nuisance** section of the SA/DEIS. The potential for nuisance shocks would be minimized through grounding and other field-reducing measures that would be implemented in keeping with current standard industry practices, and the potential for hazardous shocks would be minimized through compliance with the height and clearance requirements of CPUC's General Order 95. Compliance with Title 14, California Code of Regulations, section 1250, would minimize fire hazards, while the use of low-corona line design, together with appropriate corona-minimizing construction practices, would minimize the potential for corona noise and its related interference with radio-frequency communication in the area around the route.

As with the proposed SES Solar Two transmission lines, the public health significance of any related field exposures cannot be characterized with certainty. The only conclusion to be reached with certainty is that the proposed lines' design and operational plan would be adequate to ensure that the generated electric and magnetic fields are managed to an extent the CPUC considers appropriate in light of the available health effects information.

Comparison to Proposed Project. The South of Hwy 98 alternative site would require a longer transmission line interconnection with the SDG&E transmission system. While the electric and magnetic fields would be managed to an extent the CPUC considers appropriate, the transmission line would be located near approximately two residences. Because the transmission interconnection for the proposed site would not be located within 500 feet of any residential properties, this impact would be greater for the South of Highway 98 Alternative site than for the proposed site.

Visual Resources

Environmental Setting. The South of Highway 98 Alternative site is located on Bureau of Reclamation withdrawn land adjacent to the All-American Canal. There are canal drop stations, a substation, and one group of company housing near this alternative site. The SWPL transmission line crosses the entire length of the site. The site is south of I-8 and Highway SR-98, and north of the United States/Mexican border. This infrastructure introduces developed and industrial features to the otherwise visually open setting.

Views from the South of Highway 98 Alternative site to the north, south, west and east are of open space and some canal and transmission infrastructure. The Imperial Sand Dunes would have a distant view of the site as they are located approximately six miles to the east.

According to the Imperial County Recreation Area Management Plan Scoping Report, the BLM has not formally inventoried the lands within the Imperial Sand Dunes

Recreation Area, nor has it given the lands relative visual ratings (BLM 2008b). The BLM currently manages the recreation area according to the Multiple-Use Classes for this area. The recreation area is identified as MUC I (Intensive Use) and MUC C (Controlled Use). The MUC C corresponds with the North Algodones Dune Wilderness Area. The VRM Classes associated with Multiple-Use Classes are:

- Class I Intensive Use – VRM Class IV
- Class M Moderate Use – VRM Class III
- Class L Limited Use – VRM Class II
- Class C Controlled Use – VRM Class I.

Environmental Impacts. As stated in the **Visual Resource** section, the Energy Commission staff, in coordination with BLM, applied the BLM Visual Resource Management (VRM) system of visual assessment to the proposed SES Solar Two site at Plaster City. The existing visual setting baseline under the VRM methodology is characterized in terms of Visual Resource (VR) Classes. Under the VRM system, areas of the project viewshed are delineated and mapped based on broadly uniform characteristics of visual quality, viewers' sensitivity, and distance from project to viewers. These delineated areas are then assigned a VR Class (from I through IV). VR Classes are analogous to Overall Sensitivity ratings under the Energy Commission method and are used to determine an area's visual objective, that is, the level of project-caused contrast that is acceptable, above which contrast could constitute a potentially significant adverse impact.

With the addition of the project, views of the alternative site would change from an open landscape to a substantially more industrial, highly altered one. The industrial landscape would be dominated by the thousands of SunCatchers, approximately 38 feet high by 40 feet wide. There would be no natural features to block the view of the solar facilities on any side.

The South of Highway 98 Alternative site would be prominently visible from Highway SR 98 and I-8 for both westbound and eastbound traffic. Travelers would be immediately adjacent to the site, and there is little elevation or natural contouring to block views of the solar dishes and other facilities on the site. I-8 east of SR 111 has a lower average daily traffic count than I-8 west of SR 111 (Caltrans 2002). As such, the South of Highway 98 Alternative would be visible to fewer viewers than the proposed SES Solar Two site.

The alternative site would be potentially visible in the distance from the Imperial Sand Dunes as they are elevated. The Imperial Sand Dunes in this area are managed as MUC I, corresponding with VRM IV. The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape (BLM, 2008b). The level of change to the characteristic landscape can be high.

The linear facilities associated with the South of Highway 98 Alternative site include a 230 kV transmission lines approximately 30 miles long. The transmission lines would follow the existing SWPL ROW for the entire length of the interconnection. The South of

Highway 98 Alternative interconnection would introduce additional industrial character to this agriculture area.

Comparison to Proposed Project. The South of Highway 98 Alternative site would have similar visual impacts as the proposed SES Solar Two site. Both the proposed and alternative sites would be located next to existing infrastructure, highways, transmission lines, canals, among others. Additionally, both sites would be located near BLM ACECs as well as BLM land managed as MUC I, Intensive Use. I-8 would be adjacent to both sites, and each site has a second, major road adjacent to it. As a result, a large solar project at either site would have a number of viewers along the nearby roads, although there are fewer travelers on I-8 east of SR 111 than west of SR 111 and as such fewer viewers of the project were it built at the South of Highway 98 Alternative site.

The South of Highway 98 Alternative transmission line would create a greater visual impact than that of the SES Solar Two proposed site transmission interconnection because it would be substantially longer than at the Plaster City site. However, this alternative transmission line would be adjacent to an existing 500 kV line, would be in a remote area with minimal viewers, and would be within a designated utility corridor.

Waste Management

Environmental Setting. The South of Highway 98 Alternative site is located in desert open space environment with little commercial and industrial use. Therefore the potential for petroleum products and/or hazardous materials in the soil or groundwater is low. However, the eastern boundary of the alternative site is located south of the Brock Ranch Experimental Research Center at the proposed site for the All-American Drop 2 reservoir. Soil and groundwater at the Brock Ranch were impacted by an accidental release of diesel from an above ground storage tank, and soil sampling has indicated that some areas of the ranch have been impacted by machinery waste oil, and other soil contaminants (USBR 2007). Additional contaminants could be present on this alternative site from nearby construction on the All-American Canal.

As stated in the **Waste Management** section, hazardous and nonhazardous solid and liquid waste, including wastewater, would be generated at the SES Solar Two project during construction and operation of the solar power plant. Waste would be recycled where practical and nonrecyclable waste would be deposited in a Class III landfill. The nearest waste disposal facilities that could potentially accept the nonhazardous construction and operation wastes generated by the project are the Imperial Solid Waste Site and the Allied Imperial Landfill in Imperial, California. The remaining capacity for the disposal facilities are 184,000 cubic yards and 2.1 million cubic yards respectively.

See the Mesquite Lake analysis regarding hazardous waste generated by the project.

Environmental Impacts. Construction at the South of Highway 98 Alternative site would require excavation of fill material that underlies the site similar to that of the proposed project. Both nonhazardous and hazardous wastes would be created by the construction of the SES Solar Two project at the South of Highway 98 Alternative site in similar quantities as at the proposed SES Solar Two site and would be disposed of at appropriate facilities. The applicant would be required to obtain a unique hazardous

waste generator identification number for the site prior to starting construction and would be required to comply with similar Conditions of Certification. The project would produce minimal maintenance and plant wastes.

All nonhazardous wastes would be recycled to the extent possible, and nonrecyclable wastes would be regularly transported off site to a local solid waste disposal facility. Generation plant wastes include: oily rags, broken and rusted metal and machine parts, defective or broken electrical materials, empty containers, and other miscellaneous solid wastes, including the typical refuse generated by workers. As with the proposed project, all construction and operation activities would need to be conducted in compliance with regulations pertaining to the appropriate management of wastes. The total amount of nonhazardous waste generated from the project is estimated to be 80 cubic yards of solid waste per week from construction, and approximately 10 cubic yards per week from operation. Disposal of the solid wastes generated by the SES Solar Two facility can occur without significantly impacting the capacity or remaining life of any of these disposal facilities.

Like nonhazardous wastes, hazardous wastes would be recycled to the extent possible. The two cubic yards per week of hazardous waste from the SES Solar Two requiring off-site disposal would be far less than staff's threshold of significance and would therefore not significantly impact the capacity or remaining life of the Class I waste facilities. Similar to the proposed project, the project would need to implement a comprehensive program to manage hazardous wastes and obtain a hazardous waste generator identification number (required by law for any generator of hazardous wastes).

Comparison to Proposed Project. The environmental impacts of waste disposal at the South of Highway 98 Alternative site would be similar to those at the proposed SES Solar Two site at Plaster City.

Worker Safety and Fire Protection

Environmental Setting. The South of Highway 98 Alternative site is located within an area that is primarily open space. The area is currently served by the Imperial County Fire Department located at the airport in the City of Imperial. Mutual aid service for police and fire emergencies is available from Brawley and El Centro. See the **Worker Safety and Fire Protection** section for more information regarding the Imperial County Fire Department. As with the proposed site, the fire risks of this alternative would be low due to the sparse desert vegetation and the scattered population centers. The desert environment of the Imperial Valley does not promote fast-growing woody vegetation communities.

Environmental Impacts. A solar plant at the South of Highway 98 Alternative site would be required to provide a Project Demolition and Construction Injury and Illness Prevention Program and a Project Operations Safety and Health Program in order to ensure adequate levels of industrial safety. The applicant would also be required to provide safety and health programs for project construction, operation, and maintenance, similar to the requirements for the proposed Plaster City project site. The Imperial County fire department would be contacted to assure that the level of staffing,

equipment, and response time for fire services and emergency medical services are adequate.

Comparison to Proposed Project. The environmental impact of worker safety and fire protection at the South of Highway 98 Alternative site would be similar to that at the proposed Plaster City site.

Engineering Assessment for South of Highway 98 Alternative

Facility Design

The project's design at the South of Highway 98 Alternative would be similar to that of the SES Solar Two project at the Plaster City site. However, the project at the South of Highway 98 Alternative site would not be as constrained by the desert washes as the project would be at the Plaster City site. As with the proposed site, staff-recommended measures may be appropriate to ensure compliance with engineering laws, ordinances, regulations, and standards applicable to the design and construction of the project.

Geology, Paleontology and Minerals

Environmental Setting. As with the Mesquite Lake Alternative site, the Cahuilla Lake Beds underlie the South of Highway 98 Alternative site. The Mesquite Lake Alternative analysis provides detailed information regarding the Cahuilla Lake Beds.

The South of Highway 98 Alternative site is located approximately 10 miles east of the Imperial Valley Fault and approximately 6.5 miles southwest of the potentially active Algodones Fault (USBR 2007). In accordance with the Alquist-Priolo Earthquake Fault Zoning Act (Chapter 7.5 of Division 2, California Public Resources Code), the Office of State Geologist has delineated Special Study Zones, which encompass potentially and recently active traces of major faults, including the Imperial Fault (Imperial County 2006). No mineral resources have been identified.

Environmental Impacts. Seismic ground shaking is probable at this alternative site because it is located within 20 miles of the Imperial Valley Fault, and the Algodones Fault. The severity and frequency of ground shaking associated with earthquake activity at the South of Highway 98 Alternative site is expected to be similar to that of the proposed Plaster City site, although the alternative site is slightly closer to the active Imperial Valley Fault than the proposed site. Similar design criteria would be required for the South of Highway 98 Alternative site in accordance with a design-level geotechnical report and California Building Code (2007) standards. Adequate design parameters for the facility would need to be determined through a site-specific evaluation by a Certified Engineering Geologist or Geotechnical Engineer. Impacts due to seismic hazards and soil conditions, such as subsidence, would be addressed by compliance with the requirements and design standards of the California Building Code. The potential for liquefaction in this area is low due to anticipated depths of groundwater; however, water table may rise temporarily and sections of the South of Highway 98 Alternative site may be moderately susceptible to liquefaction if a strong earthquake occurs while the valley floor sediments are saturated.

The paleontological sensitivity and potential to encounter significant paleontological resources in Lake Cahuilla Beds at the alternative site and the Plaster City site is

similar. As stated in the **Geology, Paleontology and Minerals** section, construction of the proposed project will include grading, foundation excavation, utility trenching, and possibly drilled shafts. There exists the probability of encountering paleontological resources. As with the Plaster City site, the proposed Conditions of Certification are designed to mitigate any paleontological resource impacts to a less-than-significant level.

Comparison to Proposed Project. The South of Highway 98 Alternative site is subject to a similar risk of geologic hazards as the proposed SES Solar Two site. Strong ground shaking would be effectively mitigated through facility design. The potential to encounter geologic resources and significant paleontological resources at the alternative site is similar to the Plaster City site. The Conditions of Certification provided in the **Geology, Paleontology, and Minerals** section would be applicable to the South of Highway 98 Alternative site.

Power Plant Efficiency

The plant configuration and Stirling Engine technology that would be employed at the South of Highway 98 Alternative site would be similar to the proposed project, which means it would result in similar consumption of fuel, and it would result in a similar level of efficiency.

Power Plant Reliability

The plant configuration at the South of Highway 98 Alternative site would be similar to the proposed project, which means it would result in similar levels of equipment availability. Plant maintainability, fuel and water availability, and reliability of the plant in relation to natural hazards would each be similar to the proposed project.

Transmission System Engineering

While locating a solar facility at the South of Highway 98 Alternative site would require a longer interconnection than at the proposed SES Solar Two site, the power would interconnect with the Imperial Valley Substation. As such, the transmission system evaluation for the South of Highway 98 Alternative site would be identical to that of the SES Solar Two solar facility at the Plaster City site.

Summary of Impacts – South of Highway 98 Alternative Site

Part of the South of Highway 98 Alternative site has been identified by the BLM and DOE for in-depth study of solar development and may be found appropriate for designation as a solar energy zone in the future.

The South of Highway 98 Alternative site would have impacts similar to the proposed SES Solar Two site at Plaster City for 13 of the 20 environmental and engineering resource elements: air quality, land use, public health, socioeconomics, traffic and transportation, waste management, worker safety and fire protection, facility design, geology, paleontology and minerals, power plant efficiency, power plant reliability, and transmission system engineering.

The SES Solar Two site is preferred over the South of Highway 98 Alternative site for four resource elements: biological resources, hazardous materials, noise, and

transmission line safety and nuisance. It is believed that impacts to biological resources would be worse at the South of Highway 98 Alternative site compared with the proposed SES Solar Two site. This is because in regards to sensitive habitats and jurisdictional waters, the South of Highway 98 Alternative is the most biologically sensitive due to the presence of stabilized sand dunes and riparian habitat. In regards to rare plants, the proposed Project site and the South of Highway 98 Alternative are very similar, in that neither site has any observed locations of rare plant species, but both are relatively undisturbed sites supporting native habitat and with low to moderate potential for certain rare plants to be present.

The South of Highway 98 Alternative site would be preferred to the proposed SES Solar Two site at Plaster City for three resource elements: soils and water, cultural resources, and visual resources. Given the intensity of cultural history at the proposed Plaster City site, it is believed that impacts to cultural resources would be reduced at the South of Highway 98 Alternative site. The alternative site is located on lands that were identified as having a lower cultural sensitivity than the proposed site by Imperial County. However, without site-specific survey information about cultural resources, a detailed comparison is not possible.

B.2.8 ALTERNATIVES CONSIDERED BUT NOT EVALUATED IN FURTHER DETAIL

This section considers potential alternatives to the proposed SES Solar Two project that were evaluated, and determined to not be feasible for meeting key project objectives, they are not yet commercially available, or they would not result in lesser impacts than the proposed action. Because these alternatives would not avoid or substantially reduce the adverse impacts of the proposed Solar Two project or because they do not meet project objectives, the purpose and need for the project, or are otherwise not reasonable alternatives, they are not analyzed in further detail in this SA/DEIS.

B.2.8.1 APPLICANT'S SITE ALTERNATIVES

The following alternative sites were evaluated in this analysis and, based on the findings of those analyses, were not carried forward for detailed evaluation in this SA/DEIS:

- 900 MW Alternative (original proposed project)
- Alternative Site #1 (Site AS1)
- Alternative Site #2 (Site AS2)
- Alternative Site #3 (Site AS3)
- Wind Zero Site (Ocotillo)

Each site is discussed in the following paragraphs.

900 MW Alternative

The 900 MW Alternative was the original proposed Project. During the environmental review process conducted by the Applicant, the easternmost segment (holding 150 MW of generation) was eliminated in order to avoid specific cultural resources sites. The 900

MW Alternative was to be constructed on approximately 7,600 acres of land, and it would have been built in two phases. Phase I of the 900 MW Alternative would essentially correspond with the 300 MW Alternative described above (Phase I of the 750 MW project). Phase II would expand Phase I with an additional 600 MW. Full expansion of Phase II to 900 MW would be dependent on expansion of the Sunrise Powerlink Project. In total, approximately 36,000 SunCatchers would be required for the 900 MW Alternative.

Environmental Assessment. The 900 MW Alternative would result in greater environmental impacts than the proposed project for all resource elements, and specifically to cultural resource. This is because impacts of the 900 MW Alternative would be similar to those of the proposed project but would extend over a more extensive area.

Cultural resource impacts of the 900 MW Alternative would result in the potential to impact a larger number of cultural resources than the 750 MW alternative. During the Applicant's cultural resources analysis, field surveys, and mapping exercises, a large number of cultural resources, including lithic surface finds, were concentrated in the easternmost third of the project site. While proper protection and treatment for the resources would be required, the large concentration of the resource would cause potential delays in the project and a strong potential for significant impacts. As such, the applicant moved forward to exclude the region with the largest concentration of cultural resources from the project design.

As with the proposed project, ephemeral drainages traverse the site generally from the south to north. The 900 MW Alternative would impact all the same drainages as the proposed project as well as additional drainages located on the easternmost side of the alternative that flow toward the Westside Main Canal. Because the 900 MW Alternative would impact a greater number of ephemeral drainages, it would have the potential to impact basic stream morphology and sediment transport characteristics to a greater degree than the proposed Project. As such the alternative would result in impacts to a greater acreage of waters of the U.S.

Rationale for Elimination

The System Impact Study and Interconnection Facilities Study for the project showed that the SDG&E 500-kilovolt SWPL transmission line had sufficient capacity to accept the 300 MW output from Phase I; however, full expansion of Phase II to 900 MW would be dependent on expansion of the Sunrise Powerlink transmission line (or other comparable transmission), including an additional 500-kilovolt transmission line, from the SDG&E Imperial Valley Substation to SDG&E's service territory. Additionally, because the 900 MW Alternative would result in greater environmental impacts to all resource elements, and specifically to cultural resources and waters of the U.S., the alternative was eliminated from full consideration in the SA/EIS.

Applicant's Alternative Site #1

Alternative Site #1 (Site AS1) was identified by Solar 2, LLC in the AFC as a potential alternative site for the proposed project. Site AS1 is located in the Western Colorado (WECO) Plan area along the border between San Diego and Imperial Counties. The

elevation of Site AS1 is between approximately sea level and 130 feet above sea level. The site is located north of the Fish Creek Mountains Wilderness, approximately one mile east of the Anza-Borrego Desert State Park (ABDSP), and less than two miles east of the Vallecito Mountain Wilderness in the ABDSP.

Site AS1 was not pursued as a possible site for the proposed project by the applicant because the ground slope exceeded the 5% threshold in parts; it is located a great distance from existing roads thereby requiring longer access roads; and it lacks an adequate water supply. The site is also located in a United States Department of Defense (DOD) “no-fly,” “no-build” area(SES 2008a). Site AS1 is located northwest of the proposed SES Solar Two site in Plaster City; see **Alternatives Figure 6**.

Environmental Assessment. As with the proposed SES Solar Two site, Site AS1 would require use of 6,500 acres and would result in the permanent loss of approximately 6,500 acres of desert habitat. The project would require grading of approximately 3,000 acres and would likely result in impacts to biological and cultural resources similar to the impacts caused by the proposed project at the proposed Plaster City site.

Impacts to land use and recreation at Site AS1 would potentially be significant as it is adjacent to the Fish Creek Mountains Wilderness and would surround the Juan Bautista de Anza National Historic Trail. Like the proposed SES Solar Two site, Site AS1 is located within the CDCA and WECO Planning Areas and would require a plan use amendment. Site AS1 also includes more private lands than the proposed SES Solar Two site, which may cause site acquisition and/or control difficulties (BLM 1998).

Both the proposed SES Solar Two site and Site AS1 would have a large footprint and require extensive grading, potentially resulting in modification of site erosion and runoff characteristics. Site AS1 is within one mile of Fish Creek Mountains Wilderness and within two miles of the Vallecito Mountain Wilderness and would likely be visible from both mountain ranges and recreation areas. Given the size of the power plants and the approximately 40-ft tall SunCatchers, visual impacts would be considerable and similar to those at the proposed SES Solar Two site.

The alternative is also located in a United States Department of Defense (DOD) “no-fly,” “no-build” area and it would violate the DOD height restrictions for these zones causing impacts to land use (SES 2008a).

Rationale for Elimination

Site AS1 would likely cause biological and cultural resources impacts similar to the proposed project due to the extensive grading required for the 750 MW solar power plant (approximately 3,000 acres). Additionally, because of Site AS1 is further from a existing road than the proposed SES Solar Two site, longer access roads would be required increasing the amount of grading and potentially resulting in greater soil impacts and wind and water erosion. Because Site AS1 is located adjacent to and at a lower elevation than the Fish Creek Mountain Wilderness, visual impacts would potentially be significant and similar to the impacts at the proposed project site. Under CEQA, the alternative site was eliminated because it would not substantially lessen the

significant effects of the proposed SES Solar Two project, and because it was not feasible, see below.

In December 2007, OptiSolar, Inc. submitted an application to the BLM for use of a portion of the land identified in Alternative Site #1 for the construction and operation of a 500 MW photovoltaic solar facility (BLM 2009). As discussed earlier, under its existing regulations, BLM determines if competing applications exist for the same facility or system. Applications that are first in time are given priority in consideration and are not considered competing applications with those filed later in time. Therefore, an alternative site on BLM land with a pending application for another project is not considered a reasonable alternative to the proposed project for purposes of alternatives analysis.

Applicant's Alternative Site #2

Alternative Site #2 (Site AS2) was identified by SES Solar 2, LLC in the AFC as a potential alternative site for the proposed Solar Two project. It was not pursued by the applicant as a possible site for the proposed project because the ground slope exceeded the 5% threshold in parts. Site AS2 is located a great distance from existing roads thereby requiring longer access roads. It also lacks an adequate water supply. The site is located in a DOD "no-fly," "no-build" area (SES 2008a). Site AS2 is located approximately one mile east of Site AS1 and would have many of the same environmental and technical constraints as Site AS1; see **Alternatives Figure 6**.

Site AS2 is located in the WECO Plan area along the border between San Diego and Imperial Counties. The elevation of Site AS2 is between approximately sea level and 130 feet above sea level. The site is located northeast of the Fish Creek Mountains Wilderness and is located just west of and overlaps with the boundary of the West Mesa Area of Environmental Concern (ACEC) as shown on **Alternatives Figure 6**.

Environmental Assessment. As with the proposed SES Solar Two site, Site AS2 would require use of 6,500 acres of land and would result in the permanent loss of approximately 6,500 acres of desert habitat. The project would require grading of approximately 3,000 acres and would likely result in impacts to biological and cultural resources similar to the impacts of the proposed project at the Plaster City site. Site AS2 is adjacent to and overlaps the boundary of the West Mesa ACEC. The primary reason for establishment of this ACEC was to protect cultural resources and botanical and wildlife resources, specifically the BLM-sensitive FTHL (BLM 2002).

Impacts to land use and recreation at Site AS2 would potentially be significant as it is adjacent to the Fish Creek Mountains Wilderness and would surround the Juan Bautista de Anza National Historic Trail. Like the proposed SES Solar Two site, Site AS1 is located within the CDCA and WECO Planning Areas and would require a plan use amendment. Site AS2 is also located on more private lands than the proposed SES Solar Two site, which may cause site acquisition and control difficulties (BLM 1998).

Both the proposed SES Solar Two site and Site AS2 would have a large footprint and require extensive grading, potentially resulting in modification of site erosion and runoff characteristics. Site AS2 would be adjacent to the Fish Creek Mountains Wilderness and would likely be visible from the mountain ranges, a resource frequently used for recreation. Given the size of the power plants and the approximately 40-foot-tall

SunCatchers, visual impacts would be considerable and similar to those at the proposed SES Solar Two site.

Rationale for Elimination

Site AS2 would likely cause biological and cultural resources impacts similar to the proposed project due to the extensive grading required for the 750 MW solar power plant (approximately 3,000 acres). Additionally, because Site AS2 is further from an existing road than the proposed SES Solar Two site, longer access roads would be required increasing the amount of grading and potentially soil impacts and wind and water erosion. Under CEQA, the alternative site was eliminated because it would not substantially lessen the significant effects of the proposed SES Solar Two project and because it was not considered feasible, see below.

In December 2007, OptiSolar, Inc. submitted a application to the BLM for use of a portion of the land identified in Alternative Site #2 for the construction and operation of a 500 MW photovoltaic solar facility (BLM 2009). As discussed earlier, under its existing regulations, BLM determines if competing applications exist for the same facility or system. Applications that are first in time are given priority in consideration and are not considered competing applications with those filed later in time. Therefore, an alternative site on BLM land with a pending application for another project is not considered a reasonable alternative to the proposed project for purposes of alternatives analysis.

Alternative Site #3

Alternative Site #3 (Site AS3) was identified by SES Solar 2, LLC in the AFC as a potential alternative site for the proposed project. It was not pursued as an alternative to the proposed site because the ground slope exceeded the 5% threshold in part; it lacks an adequate water supply; and it does not have the required proximity to infrastructure. The site would have required off-road access, additional transmission capacity, and extensive off-site transmission lines (SES 2008a). Site AS3 is located due west of Westmorland, California and southwest of the Salton Sea as shown on **Alternatives Figure 6**.

Site AS3 is located in the WECO Plan area along the border between San Diego and Imperial Counties. The elevation of Site AS3 is between approximately sea level and 165 feet above sea level. The site is located approximately one mile southwest of the Salton Sea National Wildlife Refuge.

Environmental Assessment. As with the proposed SES Solar Two site, Site AS3 would require use 6,500 acres of land and would result in the permanent loss of approximately 6,500 acres of desert habitat. The project would require grading of approximately 3,000 acres and would likely result in impacts to biological and cultural resources similar to the impacts caused by the proposed project at the Plaster City site. Site AS3 is adjacent to SR 78 and southeast of the Salton Sea. The soil is dominated by chenopod scrubs and washes with slightly higher plant diversity. Dominant, perennial plant species are saltbush, iodine bush, and inkweed. The many washes are dominated by saltbush, tamarisk, and coldenia with catclaw acacia and thornbush also commonly found (BLM 2002).

Impacts to land use and recreation at Site AS3 would potentially be significant as it is approximately one mile from the Salton Sea National Wildlife Refuge. At some times of the year, up to 380 species of wildlife can be found at the refuge which is the second-most diverse refuge in the United States. Visitor activities at the Salton Sea National Wildlife Refuge include bird watching, boating, hiking and fishing (BLM 1998). Like the proposed SES Solar Two site, Site AS3 is located within the CDCA and WECO Planning Areas and would require a plan amendment. Site AS3 is not located on any private land.

Both the proposed SES Solar Two site and Site AS3 would have a large footprint and require extensive grading, potentially resulting in erosion and runoff. Site AS3 would be within one mile of the Salton Sea National Wildlife Refuge. The distance from the site to the refuge would potentially offer some visual blockage. However, because of the size of the power plants and the approximately 40-foot-tall SunCatchers, visual impacts may still be considerable and similar to those at the proposed SES Solar Two site.

Rationale for Elimination

Site AS3 would likely cause biological and cultural resources impacts similar to the proposed project due to the extensive grading required for the 750 MW solar power plant (approximately 3,000 acres). Additionally, Site AS3 is would require an extensive off-site transmission line, which would potentially cause additional environmental impacts. Under CEQA, the alternative site was eliminated because it would not substantially lessen the significant effects of the proposed SES Solar Two project, and because it was not feasible, see below.

In July 2007, SunPeak Solar submitted an application to the BLM for use of 5,587 acres of land identified in Alternative Site #3 for the construction and operation of a 500 MW photovoltaic solar facility (BLM 2009). As discussed earlier, under its existing regulations, BLM determines if competing applications exist for the same facility or system. Applications that are first in time are given priority in consideration and are not considered competing applications with those filed later in time. Therefore, an alternative site on BLM land with a pending application for another project is not considered a reasonable alternative to the proposed project for purposes of alternatives analysis.

Wind Zero Site (Ocotillo)

The Wind Zero Site near Ocotillo was suggested as an alternative site during the scoping period. The Wind Zero Project is proposed to be located on private land. It would include a military training facility and motorsport race resort proposed for 944 acres. While this acreage would not be sufficient for a contiguous 750 MW Solar facility; it could be a component of a larger, multiple site solar facility. However, the Wind Zero Site is currently under environmental review for the military training facility. A Notice of Preparation of a Draft Environmental Impact Report was filed with the State Clearinghouse on January 23, 2009 for the proposed Coyote Wells Specific Plan (CEQANET, 2009). The scoping period for that EIR closed on February 23, 2009. Because this alternative site has a proposed use and is currently undergoing environmental review for that proposed Specific Plan, this alternative site was eliminated as unfeasible and is not evaluated further in this SA/DEIS.

B.2.8.2 ALTERNATIVE SOLAR GENERATION TECHNOLOGIES

In addition to the range of alternative sites discussed earlier, several alternative solar generation technologies were evaluated as potential alternatives to the proposed SES Solar Two project (which would use the Stirling dish technology). Although alternative solar generation technologies would achieve most of the project objectives, each would have different environmental or feasibility concerns. The following solar generation technologies were considered in this analysis:

- parabolic trough technology
- solar power tower technology
- linear Fresnel technology
- photovoltaic technology – utility scale
- distributed solar technologies

Among the solar thermal technology alternatives, the linear Fresnel alternative has the potential for least ground disturbance due to its more compact configuration (reducing ground disturbance); however, the technology is proprietary and is not available to other applicants or developers. The distributed solar alternative would have fewer impacts than the proposed SES Solar Two project because it would be located on already existing buildings or on already disturbed land. However, achieving 750 MW of distributed solar PV or solar thermal would depend on additional policy support, manufacturing capacity, and lower cost than currently exists to provide the renewable energy required to meet the California Renewable Portfolio Standard requirements so additional technologies, like utility-scale solar thermal generation, would also be necessary.

These analyses assumed that the alternative technologies would be implemented on the site for the proposed SES Solar Two project, at Plaster City.

Parabolic Trough Technology

A parabolic trough system converts solar radiation to electricity by using sunlight to heat a fluid, such as oil, which is then used to generate steam. The plant consists of a large field of trough-shaped solar collectors arranged in parallel rows, normally aligned on a north-south horizontal axis, see **Alternatives Figure 7**. Each parabolic trough collector has a linear parabolic-shaped reflector that focuses the sun's direct beam radiation on a linear receiver, also referred to as a heat collection element located at the focus of the parabola. Heat transfer fluid within the collector is heated to approximately 740 degrees Fahrenheit (°F) as it circulates through the receiver and returns to a series of heat exchangers where the fluid is used to generate high-pressure steam. The superheated steam is then fed to a conventional reheat steam turbine/generator to produce electricity.

A solar trough power plant generally requires land with a less than 2% grade. On average, five to eight acres of land are required per MW of power generated. A parabolic trough power plant would include the following major elements:

- **Parabolic Trough Collectors**. The parabolic trough collectors would rotate around the horizontal north/south axis to track the sun. Reflectors, or mirrors, would focus the sun's radiation on a linear receiver located along the length of the collector.

- **Solar Boiler.** Solar boilers are designed differently than conventional gas-fired boilers in that they are fueled with hot oil instead of hot gases. This design is similar to any shell and tube heat exchanger in that the hot heat transfer fluid is circulated through tubes and the steam is produced on the shell side.
- **Heat Transfer Fluid Oil Heater**. Due to the high freezing temperature of the solar field's heat transfer fluid (54°F), to eliminate the problem of oil freezing, an oil heater would be installed to protect the system during the night hours and colder months.

Parabolic trough power plants are the currently the most established type of large solar generator. Existing facilities are located in several places, including the following:

- **Nevada SolarOne** (shown in **Alternatives Figure 7**) near Boulder City, Nevada, has been operating since June 2007. It cost over $260 million and generates 64 MW. It is the largest concentrating solar power plant to be built in the last 17 years and is the third largest plant of its kind in the world (Nevada SolarOne 2008).
- **Sunray Energy, Inc. Solar Energy Generating System** is located in Daggett, California adjacent to an abandoned power tower facility. It generates 44 MW and is shown in **Alternatives Figure 7**.
- **Kramer Junction Solar Energy Generating System** is located about 30 miles west of Barstow, California. The project is a series of utility-scale solar thermal electric power plants, which were designed and developed in the mid-1980s by LUZ Industries. The facility can produce 165 MW at full capacity (Solel 2008).

Environmental Assessment. Approximately 3,750 to 6,000 acres of land would be required for a 750 MW solar trough power plant, resulting in a permanent loss of natural desert habitat similar to the habitat loss.

If the solar trough technology were used at the Plaster City site, somewhat greater acreage may be required because that proposed site is crossed by several desert washes. Parabolic troughs require a more level ground surface, so the entire site would need to be graded for the solar trough power plant, removing all vegetation from the area. This results in a somewhat more severe effect on biological and cultural resources than the SES Solar Two project, which would not require grading the entire site.

The size and height of the solar trough mirrors (each approximately 28 feet high) would cause visual impacts from I-8 and Evan Hewes Highway. The plant would also be visible from the Yuha Basin ACEC, immediately south of the Plaster City site and slightly elevated. While the solar trough technology would be slightly lower to the ground than the Stirling Engine SunCatchers, the number of solar troughs and the large acreage required would introduce prominent and reflective structures, industrializing the area.

Solar trough plants require water to generate the steam that powers the turbines. The technology uses a closed-loop circulation that requires some boiler make-up water to replace water lost in the system. Water is also required to wash the mirrors for both types of technologies. If wet cooling were used, the cooling towers would require approximately 600 acre-feet/year (AFY) per 100 MW of capacity. Dry cooling would use significantly less water, approximately 18 AFY per 100 MW (NRDC 2008a).

Because of the extensive grading required for a solar trough plant, soil erosion and air emissions during construction could be more severe than with the SES Solar Two project.

Summary of Impacts. The land area needed for a solar trough power plant would likely be less than required for the proposed SES Solar Two project, but more intensive in terms of ground disturbance. Because of the more intensive use of the land and the grading required to achieve a 2% grade, there could be more severe impacts to biological and cultural resources than would occur with the Stirling engine facility. Use of a heat transfer fluid as would be conveyed in miles of pipelines from the parabolic trough collectors to the solar boiler would create a potential for spills of hazardous materials into soil or water, which would not be present with the proposed SES Solar Two project engine.

Rationale for Elimination

Solar trough technology is a viable renewable technology and could potentially reduce the footprint of the project between 10% and 45%. However, due to its requirement for a nearly flat, graded site, it would require more construction with greater air emissions and more erosion potential. With a minimum size of nearly 4,000 acres, solar trough technology would not eliminate any of the significant impacts of the SES Solar Two plant. Therefore, this alternative technology was eliminated from further consideration in this SA/DEIS.

Solar Power Tower Technology

The solar power tower technology converts thermal energy to electricity by using heliostat (mirror) fields to focus energy on a boiler located on power tower receivers near the center of each heliostat array. Each mirror tracks the sun during the day. The heliostats would be 7.2 feet high by 10.5 feet wide. See **Alternatives Figure 7** for an illustration. The solar power towers can be up to 459 feet tall with additional 10-foot-tall lightning rods. The solar power tower would receive heat from the heliostats then convert the heat into steam by heating water in the solar boilers. A secondary phase would convert the steam into electricity using a Rankine-cycle reheat steam turbine electric generator housed in a power block facility at each of the plants.

In general, a solar power tower power plant requires 5 to 10 acres of land per MW of power generated. A 750 MW solar power tower field would require from 3,750 acres to 7,500 acres of land.

Site preparation involves grading at the base of the heliostat and grading the access roads required for maintenance. Each heliostat field has the following primary components.

- **Heliostats.** The heliostat mirrors are arranged around each solar receiver boiler. Each mirror tracks the sun throughout the day and reflects the solar energy to the receiver boiler. The heliostats are approximately 7.2 feet high by 10.5 feet wide. They are arranged in arcs around the solar boiler towers asymmetrically.

- **Power Tower.** The power tower structure height is up to 459 feet. Primary thermal input is via solar receiver boilers, superheater and reheaters at the top of the distributed power towers.
- **Steam Turbine Generator (STGs)**. The steam turbine system consists of a condensing steam turbine generator with reheat, gland steam system, lubricating oil system, hydraulic control system, and steam admission/induction valving. Power will be generated by the STGs at 19 kV (hydrogen cooled) and then stepped up by transformers for more efficient transmission across the grid.

Environmental Assessment. The land area required for a 750 MW solar power tower plant is similar or greater to that required for the proposed SES Solar Two project. Grading of permanent access roads would be required due to the need for regular washing of the mirrors. This grading would cause removal of vegetation. Additionally, because the proposed SES Solar Two site is crossed by several desert washes, the installation of the heliostats and power towers could require a larger total acreage of land, resulting in a greater loss of habitat.

Due to the size and height of the solar power towers, up to 600 feet, and mirrors, impacts to visual resources would be greater than those of the SES Solar Two project and would introduce an industrial character to this site and the surrounding areas.

Because of the height of the solar power towers, there may be concerns regarding any nearby aviation or military operations. While the solar power tower technology built at the Solar Two site would not be located in the military no fly/no build areas, it would be located in a DOD Airspace Consultation Area and conflicts with the nearby El Centro Naval Air Facility may arise.

Rationale for Elimination

The area needed for a solar power tower plant would be comparable to the land requirement for the SES Solar Two power plant. Grading requirements for the solar power tower would be similar to the proposed Stirling technology because both technologies require access roads in between the rows of heliostats or engines. For these reasons, recreation and land use, biological resources, cultural resource and soil erosion impacts would be similar to those of the SES Solar Two facility. In addition, due to the extent of the facility and the height of the power towers, visual impacts would like be greater for this alternative. Additionally, the height of the power tower would create potential impacts with the adjacent military facilities.

Because no substantial reduction in impacts would occur under this alternative technology, the solar power tower technology was eliminated from further consideration in this SA/DEIS as an alternative technology.

Linear Fresnel Technology

A solar linear Fresnel power plant converts solar radiation to electricity by using flat moving mirrors to follow the path of the sun and reflect its heat on the fixed pipe receivers located about the mirrors. During daylight hours, the solar concentrators focus heat on the receivers to produce steam, which is collected in a piping system and delivered to steam drums located in a solar field and then transferred to steam drums in

a power block (Carrizo 2007). The steam drums transferred to the power block will be used to turn steam turbine generators and produce electricity. The steam is then cooled, condensed into water, and recirculated back into the process.

In general, the linear Fresnel technology requires four to five acres of land per MW of power generated. A 750 MW solar linear Fresnel field would require approximately 3,000 to 3,750 acres of land.

Each row-segment is supported by large hoops that rotate independently on metal castors. Rotation of the reflectors would be driven by a small electrical pulse motor. Reflectors are stowed with the mirror aimed down at the ground during the night. The major components are:

- **Compact Linear Fresnel Reflector (CLFR) Solar Concentrator.** A solar Fresnel power plant would use Ausra's CLFR technology which consists of slightly curved linear solar reflectors that concentrate solar energy on an elevated receiver structure. Reflectors measure 52.5 by 7.5 feet (Carrizo 2007). There are 24 reflectors in each row. A line is made up of 10 adjacent rows and operates as a unit, focusing on a single receiver (Carrizo 2007).
- **Receiver Structure.** The receiver structure is approximately 56 feet tall (Carrizo 2007). It would carry a row of specially coated steel pipes in an insulated cavity. The receiver would produce saturated steam at approximately 518°F from cool water pumped through the receiver pipes and heated (Carrizo 2007). The steam would drive turbines and produce electricity.

Rationale for Elimination

The Fresnel solar technology is a proprietary technology owned by Ausra, Inc. However, Ausra, Inc. has changed its focus to being a technology and equipment provider rather than an independent power developer and owner and will focus on medium-sized (50 MW) solar steam generating systems for customers including steam users, such as food processors and enhanced oil recovery firms and utilities for power augmentation systems that deliver steam into existing fossil-fuel power plants. A project of 750 MW is theoretically possible, and would require smaller acreage per megawatt. However, at nearly 4,000 acres for 750 MW, this technology would not eliminate the significant impacts of the proposed SES technology at this site.

Solar Photovoltaic Technology – Utility Scale

A utility scale solar photovoltaic (PV) power generation facility would consist of PV panels that would absorb solar radiation and convert it directly to electricity. The definition of a utility scale photovoltaic projects varies; for this analysis utility scale project would consist of any solar photovoltaic facilities that would require transmission to reach the load center, or center of use.

PV facilities have been suggested using two general technologies:

- Thin film installed on fixed metal racks, as proposed by OptiSolar, Inc. (see **Alternatives Figure 8**)

- Concentrating photovoltaics installed in elevated groups of panels that track the sun. These technologies are available from companies such as SunPower and Amonix. SunPower's PowerTracker technology consists of a single-axis mechanism that rotates the PV panels to follow the sunlight. The Amonix technology allows tracking on two axes. See **Alternatives Figure 8**.

Examples of existing utility scale PV facilities are:

- El Dorado Energy (Boulder City, NV): First Solar built a 10 MW facility using thin film technology for Sempra Energy demonstrating the commercial viability of its technology. The facility consists of over 167,000 solar modules on 80 acres of land and was completed in December 2008. (Sempra 2008). Additionally, Sempra Generation will begin expanding the facility by 48 MW in January 2010. All 58 MWs would be purchased by PG&E (Sempra 2009).
- NRG Solar (Blythe, CA): NRG Solar acquired a 21 MW thin film PV project in Blythe, CA. Commercial operation of the facility began in December 2009 and the electricity generated by the project is being sold to SCE under a 20-year power purchase agreement (NRG 2009).

Because PV technologies vary, the acreage required per MW of electricity produced from a large solar PV power plant is wide ranging and likely to change as technology continues to develop. The land requirement varies from approximately three acres per MW of capacity for crystalline silicon to more than 10 acres per MW produced for thin film and tracking technologies (NRDC 2008c). Therefore, a nominal 750 MW solar PV power plant would require between 2,250 and 7,500 acres.

Utility-scale solar PV installations require land with less than 3% slope. Solar photovoltaics do not require water for electricity generation. Because some water will be required to wash the solar panels to maintain efficiency, approximately 2 to 10 AFY of water is estimated to be required for a 100 MW utility solar PV installation or 15 to 75 AFY for a 750 MW installation (NRDC 2008c). The SunPower-CA Valley Solar Ranch states that the facility would use approximately 11.6 AFY for a 250 MW PV facility, or approximately 36 AFY for a 750 MW PV facility (SLO 2009).

Solar PV arrays and inverters would be approximately 15 to 20 feet high; however, some components of the solar PV facility, such as collector power lines or a transmission interconnection may be substantially taller (SLO 2009).

As with any large solar facility, additional operational components may be required. The SunPower-California Valley Solar Ranch would require operational components such as electrical equipment, collector power lines, access roads, a substation, an operation and maintenance building, and water tanks (SLO 2009).

Environmental Assessment. A utility scale solar PV facility would create a number of substantial adverse effects similar to those created by the proposed SES Solar Two facility. If utility scale solar PV technology were built at the SES Solar Two site, approximately 2,250 to 7,500 acres may be required, depending on the technology. Because the proposed site is crossed by several desert washes, it is likely that additional acreage would be required to site the solar PV arrays away from the major washes. Additionally,

because some solar PV technology requires ground surface with less than 3% slope, it is likely that the entire site would be graded, removing all vegetation from the area. This results in a somewhat more severe effect on biological and cultural resources than the SES Solar Two project, which would not require grading the entire site.

The size and height of the solar PV arrays would likely be visible from nearby areas, such as I-8 and Evan Hewes Highway due to the large size of the solar PV facility. The facility would also be visible from the nearby recreation areas and ACECs. The large number of solar PV arrays, access roads, and interconnection power lines required for a 750 MW solar facility would introduce prominent industrial features. However, the solar PV technology would not introduce components as tall as the 40-foot Stirling SunCatchers. Additionally, because most PV panels are black to absorb sun, rather than mirrored to reflect it, glare and reflection would be lessened.

Because the solar PV technology does not require any water for cooling or steam generation, the technology uses less water than solar concentrating technologies. Water would be required only for washing the solar PV arrays. Approximately 36 AFY would be required (SLO 2009). This is similar to the amount of water required by the SES Solar Two project which estimates use of approximately 33 AFY annually.

More extensive grading would be required for some PV technologies than for the proposed SES Solar Two facility. Because thin film solar PV facilities require land with only 3% slope and the solar panels are grouped more densely together, constructability would be challenging without significant grading. Additionally, many miles of permanent access roads would be required for washing and maintenance of the solar panels. The extensive grading would likely create greater air emissions and erosion concerns than those of the SES Solar Two project.

Summary of Impacts. The large land area required for PV development would result in similar impacts to recreation, land use, biological and cultural resources, and likely greater impacts to soil and water resources as those of the SES Solar Two facility. A utility scale PV project would reduce impacts to glare and would require minimal water for washing of the PV panels.

Rationale for Elimination

While utility scale solar PV technology is a viable renewable technology, its use would not reduce major impacts of the proposed SES Solar Two facility because the extent of land and access roads required, and the more extensive grading and stormwater management system required. Due to its requirement for a nearly flat, graded site, it would require more construction with greater air emissions and more erosion potential. With a minimum size of nearly 2,500 acres, solar PV technology would not eliminate any of the significant impacts of the SES Solar Two plant. Therefore, this alternative technology was eliminated from further consideration in this SA/DEIS.

Distributed Solar Technology

There is no single accepted definition of distributed solar technology. The *2009 Integrated Energy Policy Report* (IEPR) defines distributed generation resources as “grid-connected or stand-alone electrical generation or storage systems, connected to the distribution

level of the transmission and distribution grid, and located at or very near the location where the energy is used."

Distributed solar facilities vary in size from kilowatts to tens of megawatts but do not require transmission to get to the areas in which the generation is used. Distributed solar generation is generally considered to use photovoltaic (PV) technology although at slightly larger scales it is also being implemented using solar thermal technologies. Both technologies are considered below.

Distributed Solar PV Systems

A distributed solar 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 such as parking lots or disturbed areas adjacent to existing substations. To be a viable alternative to the proposed SES Solar Two project, there would have to be sufficient newly-installed panels to generate 750 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).

Rooftop PV systems and parking lot systems exist in small areas throughout California. Larger distributed solar PV installations are becoming more common. Examples of distributed PV systems are:

- Nellis Air Force Base (AFB, Nevada): Over 72,000 solar panels, generating 14 MW of energy, were constructed in 2007, by SunPower Corp. on 140 acres of Nellis AFB land (Whitney 2007). Energy generated is used at the Nellis AFB.
- Southern California Edison (Fontana, CA): SCE has installed over 3 MW of distributed solar energy in two phases on over 1 million square feet of commercial roof using thin film PV technology provided by First Solar. This is the beginning of a planned installation of 3.5 million PV panels that would generate 250 MW of capacity (SCE 2009).
- San Diego Gas & Electric (San Diego, CA): SDG&E's Solar Energy Project is designed to install up to 80 MW of solar PV, which would include PV installation on parking structures and tracking systems on open land (SDG&E 2008).
- Pacific Gas & Electric (San Francisco, CA): PG&E launched a five-year program to develop 500 MW of solar PV power. The program would consist of 250 MW of utility-owned PV generation and an additional 250 MW to be built and operated by independent developers under a streamlined regulatory process. PG&E's program targets mid-sized projects, between 1 and 20 MWs, mounted on the ground or rooftops within its service area (PG&E 2009).
- City of San Jose (San Jose, CA): The City of San Jose is considering the development and implementation of 50 MW of renewable solar energy on city facilities and/or land (San Jose 2009). San Jose's Green Vision lays out a goal of achieving 100% of the

city's electricity from renewable energy by 2020 and plans to implement strategies of a 24-month period to increase solar installations in San Jose by 15%. The City anticipates that City facilities with appropriate solar access including parking lots, garages, lands and landfills would be eligible for solar installation and San Jose received ARRA funding for the project.

Like utility-scale PV systems, the acreage of rooftops or other infrastructure required per MW of electricity produced is wide ranging. As stated above, California has approximately 40 million square feet (approximately 920 acres) of distributed solar PV accounting for 441 MW installed (CPUC 2008b). However, based on SCE's use of 600,000 square feet for 2 MW of energy, 225 million square feet (approximately 5,165 acres) would be required for 750 MW.

Imperial County is estimated to have the technical potential for 234 MW of distributed solar PV (CEC 2007b). However, distributed solar PV could be located throughout the State. The location of the distributed solar PV would impact the capacity factor of the distributed solar PV.[3] The capacity factor depends on a number of factors including the insolation[4] of the site. Because a distributed solar PV alternative would be located throughout the State, the insolation at some of these locations would be less than in the Colorado Desert. The Renewable Energy Transmission Initiative (RETI) assumed a capacity factor of approximately 30% for solar thermal technologies and tracking solar PV and approximately 20% capacity factor for rooftop solar PV which is assumed to be non-tracking, for viable solar generation project locations (B&V 2008; CEC 2009). Tracking distributed solar PV would have a higher capacity factor as well.

San Diego Smart Energy 2020 (SDSE). This document, put forth by E-Tech International, presents a plan for shifting the focus of the energy supply for the San Diego region from a reliance on fossil fuels and imported power to local solutions. The plan would rely on several existing and future energy elements to reduce greenhouse gas emissions from power generation and increase the electricity supply from renewable resources, while maximizing locally generated power.

The SDSE plan calls for an ambitious reduction of the energy demand and peak load in the SDG&E territory. SDSE prescribes a reduction of energy demand by 20% or 4,000 GWh/yr through energy efficiency by 2020. This includes maximizing Demand Reduction through Energy Efficiency upgrades and "smart" meters to reduce peak demand in the region to 3,500 MW. This element of the SDSE would curtail load growth.

Additionally, the SDSE also calls for developing 300 MW of solar PV systems on rooftops as part of the California Solar Initiative (CSI) with an additional 2,040 MW of nameplate capacity solar PV systems including battery storage for peaking duty under a program called the "San Diego Solar Initiative." The SDSE also includes 700 MW of new combined heat and power energy, and the use of existing combined heat and power plants and existing combined-cycle gas-fired power plants within the San Diego Region (Powers 2007).

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[3] The capacity factor of a power plant is a percentage that tells how much of a power plant's capacity is used over time (CEC 2008a)

[4] Insolation is the total amount of solar radiation striking a surface exposed to the sky (CEC 2008a).

The “San Diego Solar Initiative” would use an incentive structure similar to the CSI, which provides incentives for commercial PV applications of up to one megawatt and also provides incentives for residential systems. The objective of the incentives is to make PV cost-competitive with purchased utility power. This would be in addition to the 300 MW level of rooftop PV that SDG&E anticipates to occur as part of CSI. The development curve of the “San Diego Solar Initiative” would be similar to the rate-of-growth demonstrated in the solar PV program in Germany, which reached a growth rate of 837 MW per year in 2005 (Powers 2007). Under the “San Diego Solar Initiative,” the first 40 MW would be installed between 2008 and 2010, with the majority of the 2,040 MW becoming operational in the final few years before 2020.

A critical assumption of the “San Diego Solar Initiative” in the SDSE, as well as the CSI, is that the large market demand for solar PV systems will reduce the cost of PV to the point where PV technology will be cost-competitive with purchased utility electricity rates by 2017 without incentive payments, although federal and state tax credits are assumed to remain in place. The projected decline of the cost of solar PV systems is backed by U.S. Department of Energy projections and current industry trends (Powers 2007). Other assumptions are that the majority of the installed capacity, 75%, will be commercial installations over 100 kW and that a high level of standardization will be utilized by a limited number of large contractors to minimize costs through bulk purchasing of PV system hardware.

Distributed Solar Thermal Systems

Solar thermal technology, specifically Concentrated Solar Power (CSP) technology, has also been adapted for use at distributed locations. In August 2009, eSolar began operations of a new distributed solar power tower technology. 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 (eSolar 2009). An example of the eSolar system is the Sierra SunTower, located in Lancaster, CA, which produces 5 MW of energy for SCE on 20 acres of land (eSolar 2009). Each eSolar module locates one tower, one thermal receiver, and 12,000 mirrors on ten acres of land and produces 2.5 MW of power. Additionally, eSolar has developed a larger module, a 46 MW CSP plant that would include sixteen towers, a turbine generator set, and a steam condenser which would be located on approximately 160 acres (eSolar 2009).

Another solar thermal technology, the solar trough technology, could also be used as distributed technology. The Andasol 1 power plant in Spain generates 50 MW of power on approximately 127 acres (not including ancillary facilities) and went online in November 2008 (Solar Millenium 2008). The Andasol plant includes thermal storage systems which absorb a portion of the heat produced in the solar field during the day and can run the turbines for approximately 7.5 hours at full load, regardless of the solar conditions at the time (Solar Millenium 2008).

Both the solar thermal technologies have been implemented recently and are described here as an example of the evolving distributed solar technologies.

Environmental Assessment. Installations of 750 MW distributed solar PV would require up to 225 million square feet (approximately 5,000 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 and cultural resources impacts.

Minimal grading or new access roads would be required and relatively minimal maintenance and washing of the solar panels would be required. As such, it is unlikely that the rooftop solar PV alternative would create erosion impacts. Some 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 be lessened. Additionally, the distributed solar PV alternative would not require the additional operational components, such as dry-cooling towers, substations, transmission interconnection, and 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.

Consideration of CEQA/NEPA Criteria

Reduction of Impacts. Distributed solar technology is assumed to be located on already existing structures or disturbed areas so little to no new ground disturbance would be required; there would be few associated impacts to biological and cultural resources. Additionally, impacts to soils and waters as well as visual resources would be reduced.

Meet Most Project Objectives. A distributed solar technology alternative, if constructed at 750 MW, would meet the CEC project objectives to operate 750 MW of renewable power in California capable of selling competitively priced renewable energy. The solar technology would not necessarily meet the objective to locate the facility in areas of high solarity, because the distributed technology could be located throughout the State.

Feasibility. 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 750 MW to eliminate the need for the SES Solar Two 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 are discussed below.

- **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 five 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.

The 2009 IEPR makes a number of recommendations to support the integration of distributed generation into the California grid, expand feed-in tariffs, and support the efforts to achieve the RPS goals as a whole. It also recommends supporting new renewable facilities and the necessary transmission corridors and lines to access the facilities.

In testimony filed by the Center for Biological Diversity in the Ivanpah Solar Electric Generating System (ISEGS) proceeding [Docket No. 07-AFC-5], Bill Powers stated his disagreement with the conclusions of the ISEGS Alternatives FSA/DEIS section addressing distributed solar PV. Powers believed that the technology and manufacturing capacity would be adequate to develop 400 MW of distributed PV, and that the distribution system would be able to accommodate the additional distributed generation. He presents numerous examples of California utility programs that have committed to development of hundreds of megawatts of additional distributed solar PV.

The conclusion of this section is that, while it will very likely be possible to achieve 750 MW of distributed solar energy over the coming years, the very limited numbers of existing facilities make it difficult to conclude with confidence that it will happen within the timeframe required for the SES Solar Two project. As a result, this technology is eliminated from detailed analysis in this SA/EIS.

B.2.8.3 ALTERNATIVE RENEWABLE TECHNOLOGIES

Non-solar renewable generation technologies were considered as potential alternatives to the proposed SES Solar Two project. The following renewable generation technologies were considered in this analysis:

- wind energy
- geothermal energy
- biomass energy
- tidal energy
- wave energy

The non-solar renewable technologies alternatives (wind, geothermal, biomass, tidal, wave) would either be infeasible for meeting key project objectives at the scale of the proposed SES Solar Two project, or would not eliminate significant impacts caused by the project without creating significant impacts in other locations. Specifically, wind and geothermal energy that would be viable at some locations in Imperial County could create significant impacts to biological, visual, cultural, and water and soils resources.

None of these non-solar renewable technologies would meet the BLM's purpose and need, which is to approve, modify, or deny the applicant's request for a right-of-way. These technologies would be too great a departure from the application to be considered a modification of the applicant's proposal.

Wind Energy

Wind carries kinetic energy that can be used to spin the blades of a wind turbine rotor and an electrical generator, which then feed alternating current (AC) into the utility grid. Most state-of-the-art wind turbines operating today convert 35% to 40% of the wind's kinetic energy into electricity. A single 1.5 MW turbine operating at a 40% capacity factor generates 2,100 MWh annually.

Wind turbines currently being manufactured have power ratings ranging from 250 watts to 5 MW, and units larger than 7 MW in capacity are now under development (AWEA 2008). The average capacity of wind turbines installed in the United States in 2007 was 1.65 MW (EERE 2008). The perception of wind as an emerging energy source reached a peak in the early 1980s, when wind turbine generators to convert wind power into electricity were being installed in California at a rate of nearly 2,000 per year. Progress slowed a few years later, however, as start-up tax subsidies disappeared and experience demonstrated some deficiencies in design. At the present time, technological progress has caught up, contributing lower cost, greater reliability, and reason for genuine optimism for this renewable energy source in the future.

This technology is now well developed and can be used to generate substantial amounts of power. There are now approximately 2,490 MW of wind-generated power being produced in California (AWEA 2008).

Modern wind turbines represent viable renewable alternatives to solar energy projects in the region as exemplified by the number of wind projects applications pending at the

BLM in both California and Nevada. The BLM has received approximately 64 applications for wind projects in the California Desert District as of August 2009, for use of over 457,769 acres of land (BLM 2009b). Several of these projects are proposed to interconnect to the Sunrise Powerlink transmission line (like the proposed SES Solar Two project), including the Tule Wind project in McCain Valley, the Ocotillo Express Wind Project (located about 20 miles east of the SES Solar Two project, and several projects in northern Mexico).

Environmental Assessment. Wind turbines can create adverse environmental impacts, as summarized below (AWEA 2008):

- Wind energy requires between 5 and 17 acres per MW of energy created. As such a nominal 750 MW power plant would require between 3,750 and 12,750 acres. However, wind turbine footprints typically use only 5% of the total area.
- Erosion can be a concern in certain habitats such as the desert or mountain ridgelines. Standard engineering practices can be used to reduce erosion potential.
- Birds collide with wind turbines. Avian deaths, particularly raptors, are a substantial concern depending on raptor use of the area.
- Wind energy can negatively impact birds and other wildlife by fragmenting habitat, both through installation and operation of wind turbines themselves and through the roads and power lines that are required to support the turbines.
- Bats collide with wind turbines. The extent of bat mortality depends on turbine placement and bat flight patterns.
- Visual impacts of wind turbines can be significant, and installation in scenic and high traffic areas can result in strong local opposition. Other impressions of wind turbines are that they are attractive and represent clean energy.

Summary of Impacts. Approximately 3,750 to 12,750 acres of land would be required for a 750 MW wind electricity power plant. While wind plants would not necessarily impact the same types of wildlife and vegetation as the proposed SES Solar Two plant, the significant acreage necessary for a 750 MW wind plant would still cause significant habitat loss in addition to potentially significant impacts from habitat fragmentation and bird and bat mortality. Wind turbines are often over 400 feet high for 2 MW turbines. As such, any wind energy project would be highly visible and can conflict with civilian or military flight operations.

Rationale for Elimination

While wind electricity generation is a viable and important renewable technology in California, it would not reduce the large-scale ground disturbance and visual impacts associated with the SES Solar Two project. Therefore wind generation was eliminated from further consideration in this SA/DEIS. Furthermore, wind is part of a renewable energy supply mix along with solar thermal, which staff believes will be needed to meet SDG&E and statewide RPS requirements.

Geothermal Energy

Geothermal technologies use steam or high-temperature water obtained from naturally occurring geothermal reservoirs to drive steam turbine/generators. There are vapor dominated resources (dry, super-heated steam) and liquid-dominated resources where various techniques are used to extract energy from the high-temperature water.

Geothermal plants account for approximately 5% of California's power and range in size from under 1 MW to 200 MW. California is the largest geothermal power producer in the United States, with about 1,800 MW installed capacity; in 2007, 13,000 gigawatt hours of electricity were produced in California (CEC 2008). Geothermal plants provide highly reliable baseload power, with capacity factors from 90% to 98%.

Geothermal plants must be built near geothermal reservoir sites because steam and hot water cannot be transported long distances without substantial thermal energy loss. Geothermal power plants are currently operating in the following California counties: Lake, Sonoma, Imperial, Inyo, Mono, and Lassen.

The amount of geothermal resources available in Imperial County is uncertain. Following are historic data showing that the estimated resource value has been declining:

- A 1977 report estimated 4,500 MW of geothermal electricity could be generation from the Salton Sea, Heber, Brawley, and East Mesa resources (IID 2008a).
- The Imperial Valley Study Group (September 2005) estimated 1,950 MW of geothermal power reserves in Imperial Valley.
- Imperial County estimated 1,790 MW of geothermal resources in the General Plan (2006).
- In July, 2008 the BLM El Centro Field Office approved the leasing of all BLM-managed lands, totaling 14,731 acres, within the Truckhaven Geothermal Leasing Area. As part of the Truckhaven Geothermal Leasing Final EIS, the BLM developed a Reasonably Foreseeable Development Scenario which assumed that 50 MW (net) of geothermal generation would ultimately be developed in the Truckhaven area (BLM 2007).
- The RETI Phase 1A Report (2008) estimated an incremental capacity of approximately 2,400 MW for the entire State by 2018.
- As of December 2009, the Renewable Energy Action Team's list of Proposed Renewable Energy Projects for California included approximately 640 MW of proposed geothermal projects in Imperial County (CEC 2009).

Geothermal Alternative Scenario. There is no single 750 MW geothermal project in Imperial County. In order to develop an alternative scenario for analysis, this analysis assumes that approximately five to ten smaller projects would be required to achieve 750 MW of geothermal energy. While a site-specific environmental assessment is not possible, the following analysis describes the types of environmental impacts that geothermal facilities would create.

The amount of land required for a geothermal facility varies greatly. Examples of these facilities follow:

- As stated above, the Truckhaven EIS Reasonably Foreseeable Development Scenario of 50 MW included use of 14,731 acres of land, of which the total surface disturbance including well locations, access roads, pipelines, power plant sites, and transmission lines was approximately 400 acres.
- The Salton Sea Unit #6 project, now the Black Rock 1, 2, and 3 Geothermal Power Project, currently proposes to develop 3,180 acres of the Salton Sea Known Geothermal Resource Area (KGRA) to generate 150 MW of energy (CEC 2009a). Of the 3,180 acres, approximately 197 acres would be graded and occupied by structures (CEC 2003).
- The Obsidian Butte region of the KGRA has nine plants producing 350 MW of geothermal energy on 4,808 acres of land. The amount of ground disturbance for these projects is unknown.

Based on the above examples, 750 MW of geothermal energy could require the use of thousands of acres of land. However, the amount of ground disturbance on that area would be less than 10%. Based on the Salton Sea Unit #6 scenario, less than 900 acres of ground disturbance would be required for 750 MW of geothermal energy. The Truckhaven EIS Reasonably Foreseeable Development Scenario would require development covering nearly 6,000 acres to achieve 750 MW of energy. Additionally, while the power plant, cooling towers and brine ponds would likely be fenced, there would not likely be fencing required for the wells and well pads. In that 5 to 10 geothermal facilities would be required for provision of 750 MW, depending on the locations of the new facilities, more transmission lines and switchyards with corresponding potential impacts (i.e., biological, cultural, soil & water, land use, visual) may be required for grid interconnection, when compared to the proposed SES Two project.

Environmental Assessment

Air Quality

As with the SES Solar Two project, construction of geothermal facilities would cause dust and exhaust emissions with crews operating off-road equipment and on-road mobile sources. The construction phase activity would also cause emissions during well drilling from diesel engine exhaust, dust from activity on unpaved surfaces, and geothermal steam from well testing. Beyond the boundaries of the project area, exhaust emissions would also be caused by workers commuting to and from the construction sites, trucks hauling equipment and supplies to the sites, dump trucks hauling away dirt or vegetation debris, and trucks delivering fresh concrete.

Toxic air contaminants and odors would be emitted as a result of fuel combustion in construction-related equipment and vehicles and as a result of geothermal steam released during well testing. Hydrogen sulfide (H_2S) in geothermal steam is a toxic air contaminant and a colorless, flammable, poisonous compound with a characteristic rotten-egg odor. Ammonia also occurs in geothermal steam and is a toxic air contaminant with a pungent, penetrating odor. Ammonia is also a precursor pollutant to particulate matter in the ambient air. Releasing geothermal steam during well testing and development would cause substantial emissions of these toxic air contaminants and odors over the construction phase. Aside from closely managing the well testing

schedule, few mitigation options are available, and the impact of toxic air contaminants and odors during construction would be significant and unavoidable.

Operational air emissions would result from vehicle use that would be necessary for periodic maintenance, repair, and inspection of the facilities. Operating a geothermal power facility generally causes very low or no emissions of CO_2 or other pollutants, except when geothermal steam escapes to the atmosphere. Geothermal steam can contain varying amounts of CO_2, methane, ammonia, and H_2S.

Extracting power from geothermal steam equipment can cause emissions of ammonia and H_2S, which are odors and toxic air contaminants present in the geothermal brine. Ammonia emissions also react with ambient air to form inhalable PM10, and H_2S in the atmosphere will oxidize to SO_2 and sulfuric acid. Without proper control, emissions of these contaminants would cause increased health risks, create objectionable odors, and cause or substantially contribute to violations of H_2S and/or PM10 ambient air quality standards. These contaminants would be emitted during any short-term commissioning activities or uncontrolled releases of geothermal steam, but these impacts would be less than significant because they would be short-term and managed in accordance with ICAPCD permitting requirements.

Ammonia and H_2S emissions could be avoided with sulfur control systems and use of an air-cooling system to reduce cooling tower drift. Commonly, water cooling causes the geothermal fluid entering the cooling tower to be emitted to the atmosphere as water vapor, which results in high levels of ammonia and H_2S in the vapor from the cooling tower. However, a binary cycle plant emits only fresh water vapor from the cooling tower. Cool geothermal brine is injected into the ground after the energy is extracted.

Comparison to Proposed Project. The construction emissions resulting from building five to ten geothermal facilities would be similar to the type of construction emissions for the SES Solar Two project. However, the five to ten geothermal facilities would require fewer acres of ground disturbance. Operational emissions from the geothermal facilities would be greater than those of the proposed SES Solar Two project because of the potential emissions of ammonia and H_2S. However, with mitigation, these impacts would be less than significant.

Biological Resources

The development and utilization of geothermal energy could have adverse impacts to vegetation and wildlife from the construction of well pads, wells, ponds, power plants, access roads, pipelines, transmission lines, other generation or transmission facilities, and any temporary extra workspace. Construction of geothermal projects would cause both temporary (during construction from vegetation clearing) and permanent (displacement of vegetation with project features) impacts to vegetation and wildlife habitat. Construction activities may also result in the alteration of soil conditions, including the loss of native seed banks and changes in topography and drainage, such that the ability of a site to support native vegetation after construction is impaired. Desert ecosystems are especially sensitive to ground disturbance and can takes decades to recover, if at all. Because the geothermal facilities would not require the entire geothermal field to be fenced, wildlife migration would potentially be allowed to continue.

Exploratory drilling and associated surface disturbances could cause soil to become contaminated with construction-related materials, such as oils, greases, hydraulic fluids, etc. Pollutants and contaminated soil have the potential to enter jurisdictional waters and, ultimately, the Salton Sea.

Additionally, the BLM Final EIS for the Truckhaven Geothermal Leasing Areas identified potential impacts to the Flat-Tailed Horned Lizard (FTHL) as a concern for developing geothermal facilities in this region of Imperial County. The EIS included mitigation measures/best management practices to minimize impacts to FTHL habitat.

Comparison to Proposed Project. As with the SES Solar Two project, the construction of five to ten geothermal facilities would result in ground disturbance and loss of vegetation and wildlife habitat. However, the geothermal facilities would disturb fewer acres than the SES Solar Two facility. Additionally, because the geothermal field would not require perimeter fencing as with the SES Solar Two project, the impact to wildlife migration would be reduced. As such, the geothermal facilities would create fewer impacts to biological resources compared with the SES Solar Two project.

Cultural Resources

Known archaeological, architectural, or historical sites would potentially be affected by construction and operation of a geothermal facility. For example, there are 179 known archaeological sites within the Truckhaven Geothermal Leasing Area which may be impacted by the construction of geothermal facilities at this location. Conditions of Certification such as those required for the SES Solar Two Project at Plaster City provided in the **Cultural Resources** section of this SA/DEIS may reduce this impact; however, specific site surveys would be required to be certain.

Currently unknown, unrecorded cultural resources may be found at the geothermal facility sites. As they are discovered, resources are recorded and information retrieved. If the nature of the resource requires it, the resource is protected. When discovered, cultural resources are treated in accordance with applicable federal and state laws and regulations as well as the mitigation measures and permit requirements applicable to a project. As with the SES Solar Two Plaster City location, resources discovered during construction of current and future projects would be subject to legal requirements designed to protect them, thereby reducing the effect of impacts.

Comparison to Proposed Project. While the construction of five to ten geothermal facilities would result in ground disturbance and could impact known and unknown cultural resources, the facilities would disturb fewer acres than the SES Solar Two facility. As such, it is likely that the geothermal facilities would create fewer impacts to cultural resources compared with the SES Solar Two project.

Hazardous Materials

Soil or groundwater contamination could result from accidental spill or release of hazardous materials at the geothermal facility during operations or maintenance of the transmission line, towers, wells or power plant. This could result in exposure of the facility, maintenance workers, and the public to hazardous materials; and could result in contamination to soil and/or groundwater.

Geothermal plants can also produce waste and byproducts that can have significant impacts. The most potentially harmful gas generally encountered in geothermal systems is H_2S, which at concentrations higher than 30 parts per million (ppm) is toxic (CEC 2003). It can cause a variety of problems including dizziness, vomiting, and eventually death if one is exposed for long periods of time. In concentrations above 100 ppm, H_2S can be fatal. H_2S is heavier than air and can accumulate in low-lying areas (equipment pits, ravines, and other depressions) and become concentrated over time.

H_2S releases could potentially be of concern during drilling, well testing, and plant start-up and shut-down operations, although recent technology improvements in atmospheric separators can significantly decrease emissions and noise during these operations. H_2S is now often abated at geothermal power plants, resulting in a conversion of close to 100% of the H_2S into elemental sulfur (GEA 2007). Since 1976, H_2S emissions have decreased from 1,900 pounds per hour to 200 pounds per hour despite an increase in geothermal power production from 500 MW to 2,000 MW (GEA 2007).

Comparison to Proposed Project. Both the construction and operation of five to ten geothermal facilities and the SES Solar Two Project would require the use of H_2S. However, because of the potentially harmful releases of hydrogen sulfide with geothermal projects, impacts from hazardous materials would be worse for the geothermal facilities. However, with mitigation these impacts would likely be less than significant.

Land Use

The amount of land required for geothermal facilities varies greatly and is contingent in part on the geothermal resource below ground. The amount of ground disturbance for a geothermal facility is significantly smaller than the total amount of land required for the geothermal field, approximately 10%. Impacts to land use depend on the existing use of the land. For example, BLM lands within the Truckhaven area are open space areas. No sensitive land uses would be traversed by or adjacent to the Truckhaven Geothermal Leasing Area. However, the Truckhaven area is used by off-highway vehicles and would potentially create impacts to recreation (see the discussion of **Recreation and Wilderness** below).

Comparison to Proposed Project. Five to ten geothermal facilities are expected to require thousands of acres of land similar to the SES Solar Two facility. While a smaller portion of this land would be disturbed, the entire site would be converted to an industrial use, similar to that of the SES Solar Two facility.

Recreation and Wilderness

The construction of pipelines, wells, storage yards, staging areas, power plants, transmission lines, and roads for geothermal facilities would reduce the amount of land available to recreationists for hiking, wildlife viewing, camping, and ORV use. For example, approximately 83% of the Truckhaven Geothermal Leasing Area is within the Ocotillo Wells State Vehicular Recreation Area (SVRA). Most vehicles gain access to the SVRA through OHV routes accessible via SR78. Geothermal development in the area would restrict or reduce the opportunities for OHV vehicles to access certain areas of the SVRA during construction of geothermal wells and electric generation facilities.

Additionally, geothermal facilities would result in a long-term impact from the noise and vibration of the power plant and nearby pipelines. Views of equipment or the addition or change of industrial structures such as pipelines, power lines, and power production facilities conflict with the natural background of recreational resources in the desert and could also diminish users' recreational experiences on lands that remain open for recreation.

Comparison to Proposed Project. As with the SES Solar Two facility, geothermal facilities constructed on Federal land could disrupt the use of recreation and wilderness lands.

Noise and Vibration

Construction of the proposed facilities would require heavy equipment operations for grading, filling, compacting, and paving. After site preparation, noise would be generated by well-boring equipment and by normal construction activities such as the use of power saws, drills, and hammers. Noise will be generated from drilling and testing operations at each well pad and would create both continuous and intermittent noise.

Typically, the loudest noise encountered during construction, inherent in building any project incorporating a steam turbine, is created by the steam blows. After erection and assembly of the steam system, the piping and tubing that comprises the steam path has accumulated dirt, rust, scale and construction debris such as weld spatter, dropped welding rods and the like. If the plant were started up without thoroughly cleaning out these systems, all this debris would find its way into the steam turbine, quickly destroying the machine.

In order to prevent this, before the steam system is connected to the turbine, the steam line is temporarily routed to the atmosphere. High pressure steam is then allowed to escape to the atmosphere through the steam piping. This flushing action, referred to as a steam blow, is quite effective at cleaning out the steam system. Such steam blows could produce noise as loud as 118 dBA at a distance of 100 feet. However, silencers can be used to reduce noise levels by up to 44 dBA (CEC 2003).

Well operations and energy generation would also contribute to increased noise levels. The principal noise sources would be turbine operations, noise generated from cooling tower, and associated project vehicles. However, at any distance greater than roughly 0.5 miles, power plant operation would generate noise levels indistinguishable from existing ambient noise levels.

Comparison to Proposed Project. Both geothermal facilities and the SES Solar Two facility would require use of heavy equipment which would create construction noise. However, the drilling of the geothermal wells would likely require 24-hour drilling and the power plant would operate 24 hours a day, creating additional noise 24 hours daily. Additionally, the geothermal facility operation would require steam blows. The additional noise caused by the geothermal facilities would create greater noise impacts than the SES Solar Two facility.

Public Health and Safety

Without meteorological conditions and topography at the specific geothermal sites, conclusions regarding air dispersion modeling and a human health risk assessment are not possible. The analysis for the Salton Sea Unit #6 resulted in a less than significant and this same analysis would be required for each of the five to ten geothermal facilities required to achieve 750 MW of geothermal energy. Without more specific site analysis comparison with the proposed SES Solar Two facility is not possible.

One additional concern regarding hazardous materials present in geothermal facilities includes the possibility for bacterial growth to occur in the cooling tower, including Legionella. Legionella is a type of bacteria that grows in water and causes Legionellosis, otherwise known as Legionnaires' disease. Untreated or inadequately treated cooling systems in the United States have been correlated with outbreaks of Legionellosis. These outbreaks are usually associated with building heating, ventilating, and air conditioning (HVAC) systems but it is possible for growth to occur in industrial cooling towers. In order to ensure that Legionella growth is kept to a minimum, mitigation would require the project owner to prepare and implement a biocide and anti-biofilm agent monitoring program to ensure that proper levels of biocide and other agents are maintained within the cooling tower water at all times, that periodic measurements of Legionella levels are conducted, and that periodic cleaning is conducted to remove bio-film buildup. With the use of an aggressive antibacterial program coupled with routine monitoring and biofilm removal, the chances of Legionella growing and dispersing would be reduced to insignificance.

Comparison to Proposed Project. Without site specific information, a detailed comparison of the risk to public health and safety is not possible.

Socioeconomics and Environmental Justice

The socioeconomic impacts of building five to ten geothermal facilities in Imperial County would be similar to building and operating the SES Solar Two project at the proposed site. The source of construction and operation workers would be similar and the estimated benefits to Imperial County would be similar. However, unlike the SES Solar Two facility, the geothermal facilities would be required to pay property taxes on their facility over the life of the project increasing the county's revenue.

Soil and Water Resources

The construction activities associated with geothermal exploration and development have the potential for adverse impacts to surface water quality, especially through erosion of disturbed soil and resulting sedimentation. Accelerated wind and water-induced erosion may result from earthmoving activities associated with construction. Precipitation, or high intensity and short duration runoff events coupled with ground disturbing activities, can result in onsite erosion eventually increasing the sediment load into nearby waters, notably the Salton Sea. Soils devoid of vegetation have a high potential for erosion, particularly when disturbed. Background levels of erosion and sedimentation would also be high for the same reason.

A Stormwater Pollution Prevention Plan (SWPPP) would be required for construction of the geothermal facilities. This SWPPP will outline best management practices that will

control sedimentation during construction. However, since the projects would involve extensive construction and grading over the site area, it is recommended that a drainage plan be developed to ensure minimal long-term disturbance to drainage patterns.

Excavation for geothermal wells and other project facilities, including tower foundations in shallow groundwater could contaminate groundwater if oil from excavation equipment is spilled into the excavation pit. However, per typical permit requirements, any facilities related to geothermal exploration and development must be designed with appropriate standards to protect against such releases.

A geothermal brine spill could adversely impact the soils surrounding pipelines. If a surface spill were to reach lands currently farmed, the soil would be rendered hypersaline and most likely unsuitable for agricultural purposes. It is likely that if a spill were to occur, such disturbance would be temporary, lasting only as long as remediation measures required.

The operation of the geothermal facilities and of wells, pipelines, and power facilities could cause indirect impacts to surface or groundwater quality due to a pipeline rupture, leakage, or failure from a surface impoundment or well casing leakage. Pipeline, pond, or well failures could be related to a seismic event. Any facilities related to geothermal exploration and development would be designed in accordance with appropriate standards to protect against such releases.

Imperial County ordinances state that developments below elevation –220 feet (220 feet below sea level) are required to apply for a Development Permit. As such, geothermal facilities may be required to erect berms to protect the project from flooding caused by the Salton Sea or other water ways in Imperial County.

Geothermal facilities may require use of large amounts of fresh water. For example, the Salton Sea Unit #6 project would require approximately 293 AFY of fresh water during an average year, but could require up to 987 AFY if the brine were to reach a salinity of 25.0%. This would translate into approximately 1,200 AFY during an average year for 750 MW of geothermal facilities and up to 4000 AFY.

Comparison to Proposed Project. Impacts related to erosion, sedimentation and stream morphological changes for the SES Solar Two project will remain significant after mitigation. As a result of issues related to this significant impact, the project will likely not comply with Section 404 of the Clean Water Act, administered by the U.S. Army Corps of Engineers. Impacts related to erosion and sedimentation for the five to ten geothermal projects are assumed to be mitigable to less than significant because a geothermal facility requires much less ground disturbed than the SES Solar Two facility and because there is flexibility when siting the geothermal plant structures and well pads. As such, the geothermal facilities would create lesser impacts to soils and water than the proposed SES Solar Two facility. However, it should be noted that the geothermal facility would require a significantly greater amount of water than the SES Solar Two facility during project operation.

Traffic and Transportation

Before construction could occur at the geothermal facilities, a construction traffic control and transportation demand implementation program would need to be developed in coordination with Caltrans. This analysis may result in the need to limit construction-period truck and commute traffic to off-peak periods to avoid or reduce traffic and transportation impacts. These impacts would likely similar to those of the proposed project as the geothermal projects would likely require the use of I-8 and other smaller roads for access.

Comparison to Proposed Project. Impacts to traffic and transportation of the geothermal facilities would be similar to those at the proposed SES Solar Two site. Impacts to traffic and transportation during operation of the geothermal facilities would be reduced compared with the SES Solar Two project because the geothermal facilities would have no glare impacts to oncoming traffic.

Transmission Line Safety and Nuisance

Similar to the proposed project, this alternative would not be likely to cause transmission line safety hazards or nuisances. As stated in the **Transmission Line Safety and Nuisance** section, the potential for nuisance shocks would be minimized through grounding and other field-reducing measures that would be implemented in keeping with current standard industry practices, and the potential for hazardous shocks would be minimized through compliance with the height and clearance requirements of CPUC's General Order 95. Compliance with Title 14, California Code of Regulations, section 1250, would minimize fire hazards, while the use of low-corona line design, together with appropriate corona-minimizing construction practices, would minimize the potential for corona noise and its related interference with radio-frequency communication in the area around the route. As with the proposed SES Solar Two transmission lines, the public health significance of any related field exposures cannot be characterized with certainty. The only conclusion to be reached with certainty is that the proposed lines' design and operational plan would be adequate to ensure that the generated electric and magnetic fields are managed to an extent the CPUC considers appropriate in light of the available health effects information.

Visual Resources

Geothermal facilities would require a power plant, production wells, injection wells, and pipelines to connect the wells to the plants. The wells would be approximately 15 feet high and the pipelines may run several miles (CEC 2003). The pipelines may be elevated up to three feet off the ground. The most visible features of geothermal projects would include the steam turbine generator and crane, crystallizers, cooling towers, dilution water heaters, and emergency relief tanks (CEC 2003). The transmission interconnection and switchyards would also be visible components of a geothermal facility.

Construction of geothermal power plant and linear facilities would cause temporary adverse visual impacts due to the presence of equipment, materials, and workforce. Construction would involve the use of cranes, heavy construction equipment, temporary storage and office facilities, and temporary laydown/staging areas. Construction would

include site clearing and grading, trenching, construction of the actual facilities, and site and rights-of-way cleanup and restoration.

Geothermal projects would introduce the prominent geometric forms and vertical and horizontal lines of the various structures and stacks. These structural characteristics would be consistent with the forms and lines related to any existing industrial facilities and would contrast with natural forms and lines present in the setting. The wells and pipelines would be visible to motorists and agricultural workers in the local area, particularly if they are incased in shiny aluminum jackets or are painted with reflective paint.

Geothermal facilities would likely require nighttime lighting for operational safety and security though not FAA beacons. Lighting would be directed on site to avoid back-scatter, and shielded from public view to the extent practical. High illumination areas not occupied on a regular basis would be provided with switches or motion detectors to light these areas only when occupied.

Visible plumes from cooling towers would occur. The resulting visual contrast would be high and the power plant and cooling tower would appear co-dominant compared to the surrounding landforms. Geothermal unabated dilution water heater plume may be a somewhat prominent and persistent feature in the views from sections of local roads and residences.

Comparison to Proposed Project. Geothermal facilities would introduce industrial facilities into what may be predominantly natural settings. Additionally, geothermal facilities may have visible plumes that rise hundreds of feet into the air. However, the permanent facilities required for a geothermal facility would be much less extensive than those required at the SES Solar Two project with thousands of SunCatchers approximately 40 feet tall. Additionally, a geothermal facility would not have visible glare from the SunCatchers' mirrors during the daytime hours. As such, visual impacts of the SES Solar Two facility would likely be reduced with use of geothermal power.

Waste Management

The minimal amounts of nonhazardous waste generated from geothermal projects, would be disposed of in a Class III waste disposal site. The brine pond solids would constitute the largest percentage of waste at geothermal facilities. Brine pond solids and scale found in pipes, clarifiers, and separators during maintenance shutdowns would be disposed of as hazardous waste in a Class I landfill. The drilling waste and H_2S abatement waste would be tested and, if found hazardous, would be disposed of in a Class I landfill.

Comparison to Proposed Project. The environmental impacts of waste disposal at geothermal facilities would be similar to those at the proposed SES Solar Two site at Plaster City and would not be expected to create significant impacts.

Worker Safety and Fire Protection

Industrial environments are potentially dangerous, during both construction and operation of facilities. Workers at the proposed project will be exposed to loud noises, moving equipment, trenches, and confined space entry and egress problems. The

workers may experience falls, trips, burns, lacerations, and numerous other injuries. They have the potential to be exposed to falling equipment or structures, chemical spills, hazardous waste, fires, explosions, and electrical sparks and electrocution. It is important for the facilities to have well-defined policies and procedures, training, and hazard recognition and control at their facility to minimize such hazards and protect workers. If the facility complies with all LORS, workers will be adequately protected from health and safety hazards (CEC 2003).

During construction and operation of the geothermal facilities there is the potential for both small fires and major structural fires. Electrical sparks, combustion of fuel oil, flammable gas or liquids, explosions, and over-heated equipment, may cause small fires. Major structural fires may develop from uncontrolled fires or be caused by large explosions of flammable gasses or liquids. Compliance with all LORS will be adequate to assure protection from all fire hazards.

Comparison to Proposed Project. The environmental impact of worker safety and fire protection at geothermal facilities sites would be similar to that at the proposed Plaster City site.

Engineering Assessment

Facility Design

This analysis encompasses the civil, structural, mechanical and electrical engineering design of a project. It is assumed that each renewable technology would abide by the required LORS for that facility and would comply with the California Building Standards Code.

Geology, Paleontology and Minerals

Active seismicity and subsidence generally occur in areas with high levels of tectonic activity (e.g., volcanic regions, fault zones), which are the same areas in which geothermal resources occur; therefore, it is difficult to discern between power plant-induced and naturally occurring seismicity and subsidence. Drilling deep into the earth's crust to access high-temperature geothermal resources and subsequent re-injection of fluid into the geothermal reservoir may result in microearthquakes, which are generally below magnitude 2–3 on the Richter scale. These microearthquakes are typically centered on the injection site and are too low to be noticed by humans (Kagel 2007).

The applicant would follow all applicable building codes and standard practices for power plant construction as required by the CEC including: Title 24, California Code of Regulations, which adopts the current edition of the CBC as minimum legal building standards; the 2001 California Building Code (CBC) for design of structures; the 1996 Structural Engineers Association of California's Recommended Lateral Force Requirements, for seismic design; ASME-American Society of Mechanical Engineers Boiler and Pressure Vessel Code, and the NEMA-National Electrical Manufacturers Association.

Subsidence can occur naturally or through the extraction of subsurface fluids, including geothermal fluids. Subsidence has been proven to be effectively mitigated through injection of spent geothermal fluids into the underground reservoir (CEC 2003a).

Injection is regulated by the U.S. Environmental Protection Agency (EPA) to adhere to requirements of the Underground Injection Control Program.

Site specific information regarding mineral resources and paleontological resources would be required. However, it is likely that should mineral resources and paleontological resources be present, mitigation would be required to reduce the impacts to less than significant. This is because both mineral and paleontological resources could be avoided through the flexible siting of the project infrastructure.

Comparison to Proposed Project. Geothermal facilities sites would create greater impacts to geologic resources because they are known to create microearthquakes through the development of the technology.

Power Plant Efficiency

Both geothermal facilities and the SES Solar Two project would decrease reliance on fossil fuel, and would increase reliance on renewable energy resources. They 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 of inefficient manner.

Power Plant Reliability

Geothermal facilities may achieve a 95% or higher availability (CEC 2003). Because the geothermal steam is available throughout the day, geothermal facilities provide an adequate level of reliability throughout the entire day.

Comparison to Proposed Project. Compared to solar energy, geothermal facilities provide a higher reliability because of their ability to provide base load energy throughout the entire day, whereas solar projects can generate power only when the sun is shining.

Transmission System Engineering

The geothermal facilities would require evaluating the capacity of the transmission lines that would be used for interconnection. The geothermal facilities may cause adverse effects to the transmission system and require system upgrades.

Summary of Impacts – Geothermal Technology

Geothermal facilities would have impacts similar to the proposed SES Solar Two project for 10 of the 20 environmental and engineering resource elements: land use and recreation, public health, socioeconomics, transmission line safety and nuisance, waste management, worker safety and fire protection, facility design, power plant efficiency, and transmission system engineering.

Geothermal generation would likely have greater impacts than the proposed SES Solar Two site for four resource elements: air quality, hazardous materials, noise, and geology, paleontology and minerals.

Geothermal generation would likely have fewer impacts than the proposed SES Solar Two site at Plaster City for six resources: biological resources, cultural resources, soil and waters, traffic and transportation, visual resources, and power plant reliability.

Rationale for Elimination

Geothermal generation is a commercially available technology and is important for California's renewable energy future because it provides baseload power that is available 24 hours a day. It also can be developed with substantially less ground disturbance than that needed for the SES Solar Two project, so impacts related to biological and cultural resources, water and soils resources, and traffic/transportation would reduced. The Imperial Valley's geothermal resources are also within reach of the proposed Sunrise Powerlink, and are relatively close to the San Diego metropolitan load center. However, despite the encouragement provided by Renewable Portfolio Standard targets and ARRA funding, few new projects have been proposed in the Imperial Valley and no geothermal projects are included on the Renewable Energy Action Team list of projects requesting ARRA funds. Therefore, while the technology is clearly feasible and additional development is expected, the technology is not retained for detailed analysis in this SA/DEIS.

Biomass Energy

Electricity can be generated by burning organic fuels in a boiler to produce steam, which then turns a turbine; this is biomass generation. Biomass can also be converted into a fuel gas such as methane and burned to generate power. Wood is the most commonly used biomass for power generation. Major biomass fuels include forestry and mill wastes, agricultural field crop and food processing wastes, and construction and urban wood wastes. Several techniques are used to convert these fuels to electricity, including direct combustion, gasification, and anaerobic fermentation. Biomass facilities do not require the extensive amount of land required by the other renewable energy sources discussed, but they generate much smaller amounts of electricity.

Currently, nearly 19% of the state's renewable electricity derives from biomass and waste-to-energy sources (CEC 2007). Most biomass plant capacities are in the 3- to 10 MW range and typically operate as baseload capacity. The average size of a sales generation biomass plant is 21 MW (CBEA 2008). Unlike other renewable sources, the locational flexibility of biomass facilities would reduce the need for substantial transmission investments. Solid fuel biomass (555 MW) makes up about 1.75% of the state's electricity, and landfill methane gas generation (260 MW) makes up about 0.75%. Existing landfills not now producing electricity from gas could add a maximum of about 170 MW of new generation capacity (CBEA 2008).

Environmental Assessment. Generally, small amounts of land are required for biomass power facilities; however, a biomass facility should be sited near a relatively large source of biomass to minimize the cost of bringing the biomass waste to the facility.

Operational noise impacts may be a concern, originating from truck engines as a result hauling operations coming from and going to the facility repeatedly on a daily basis.

Other operations of the biomass facilities, while internal to the main structure, can result in increased noise due to the material grinding equipment.

The emissions due to biomass fuel-fired power plant operation are generally unavoidable. Direct impacts of criteria pollutants could cause or contribute to a violation of the ambient air quality standards. Significant impacts can potentially occur for PM10 and ozone because emissions of particulate matter and precursors and ozone precursors could contribute to existing violations of the standards for those criteria pollutants. Biomass/biogas facility emissions could also adversely affect visibility and vegetation in federal Class I areas or state wilderness areas as a result of significantly deteriorating air quality related values in the wilderness areas. Toxic air contaminants from routine operation would also cause health risks that could adversely affect sensitive receptors in the local area of the plant.

Rationale for Elimination

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. Biomass facilities also generate significant air emissions and require numerous truck deliveries to supply the plants with the biomass waste materials. Also, in waste-to-energy facilities, there is some concern regarding the emission of toxic chemicals, such as dioxin, and the disposal of the toxic ash that results from biomass burning. Therefore, this technology is not analyzed in detail in this SA/DEIS as an alternative to the SES Solar Two project.

Tidal Energy

The oldest technology to harness tidal power for the generation of electricity involves building a dam, known as a *barrage*, across a bay or estuary that has large differences in elevation between high and low tides. Water retained behind a dam at high tide generates a power head sufficient to generate electricity as the tide ebbs and water released from within the dam turns conventional turbines.

Certain coastal regions experience higher tides than others. This is a result of the amplification of tides caused by local geographical features such as bays and inlets. In order to produce practical amounts of power for tidal barrages, a difference between high and low tides of at least 5 meters is required. There are about 40 sites around the world with this magnitude of tidal range. The higher the tides, the more electricity can be generated from a given site and the lower the cost of the electricity produced. Worldwide, existing power plants using tidal energy include a 240 MW plant in France, a 20 MW plant in Nova Scotia, and a 0.5 MW plant in Russia (EPRI 2006).

Tidal Fences

Tidal fences are effectively barrages that completely block a channel. If deployed across the mouth of an estuary, they can be very environmentally destructive. However, in the 1990s, their deployment in channels between small islands or in straights between the mainland and islands has increasingly been considered a viable option for the generation of large amounts of electricity.

The advantage of a tidal fence is that all the electrical equipment (generators and transformers) can be kept high above the water. Also, by decreasing the cross-section of the channel, current velocity through the turbines is significantly increased.

The United Kingdom is currently considering the feasibility of tidal energy across the Bristol Channel. The feasibility study began with the consideration of the Severn tidal barrage. The barrage would work similarly to a dam which generates hydro electric power by holding water back before it is allowed to flow at speed through a pipe at the base of the dam to drive the turbines (BBC 2007). Since then, alternative tidal projects have been proposed, including a tidal fence that would allow shipping to move freely and keep ports at Cardiff and Bristol open (BBC 2008). The results of the feasibility study are expected to be published in 2010; however, preliminary results from the Sustainable Development Commission confirmed the potential of the huge Severn tidal range to generate approximately 5% of United Kingdom's electricity (BIS 2009). Tidal Turbines

Tidal turbines are the chief competition to the tidal fence. Looking like an underwater wind turbine, they offer a number of advantages over the tidal fence. They are less disruptive to wildlife, allow small boats to continue to use the area, and have much lower material requirements than tidal fences.

Tidal turbines function well where coastal currents run at 2 to 2.5 meters per second (slower currents tend to be uneconomic while larger ones stress the equipment). Such currents provide an energy density four times greater than air, meaning that a 15-meter-diameter turbine will generate as much energy as a 60-meter-diameter windmill. In addition, tidal currents are both predictable and reliable, a feature which gives them an advantage over both wind and solar systems. The tidal turbine also offers significant environmental advantages over wind and solar systems because the majority of the assembly is hidden below the waterline and all cabling is along the sea bed.

There are many sites around the world where tidal turbines could be effectively installed. An ideal site is close to shore (within 1 kilometer) in water depths of about 20 to 30 meters. In April 2007, the first major tidal-power project was installed in the United States off New York City's Roosevelt Island (Fairley 2007). Turbines such as those used in New York City use in-flow turbines, thereby lessening the environmental impacts. A study conducted in 2006, *System Level Design, Performance, Cost and Economic Assessment – San Francisco Tidal In-Stream Power Plant*, concluded that a tidal plant located under the Golden Gate Bridge could create approximately 35 MW of power with no significant impacts to the environment and recommended further research and development into both ocean energy technology and a pilot project in San Francisco (EPRI 2006a).

Environmental Assessment. Tidal technologies, especially tidal fences, have the potential to cause significant biological impacts, especially to marine species and habitats. Fish could be caught in the unit's fins by the sudden drop in pressure near the unit. The passageways, more than 15 feet high and probably sitting on a bay floor, could squeeze out marine life that lives there or alter the tidal flow, sediment build-up, and the ecosystem in general. Even the in-flow turbines can have adverse impacts on marine systems. The in-flow turbines off New York City must undergo environmental monitoring

for 18 months to ensure the turbines will not create adverse impacts to the river's marine wildlife. Also, depending on the location of the tidal technology, commercial shipping could be disrupted during construction.

The reduced tidal range (difference between high and low water levels) resulting from tidal energy generation can destroy inter-tidal habitat used by wading birds. Sediment trapped behind the barrage could also reduce the volume of the estuary over time.

Rationale for Elimination

Tidal fence technology is a commercially available technology in Europe, although limited to areas that are adjacent to a body of water with a large difference between high and low tides, and it can result in significant environmental impacts to ocean ecosystems. In-flow tidal turbines are a relatively new technology and are not considered an alternative to the SES Solar Two project because they are an unproven technology at the scale that would be required to replace the proposed project. Additionally, the potential for adverse impacts of tidal turbines is still under review, as demonstrated by the pilot project under environmental monitoring in New York. Therefore, this technology is not analyzed in detail in this PSA/EIS as an alternative to the Solar Two project.

Wave Energy

Wave power technologies have been used for nearly 30 years. Setbacks and a general lack of confidence have contributed to slow progress towards proven devices that would have a good probability of becoming commercial sources of electrical power using wave energy.

The highest energy waves are concentrated off the western coasts of the United States in the 40° to 60° latitude range north and south. The power in the wave fronts varies in these areas between 30 and 70 kilowatts per meter (kW/m) with peaks to 100 kW/m in the Atlantic southwest of Ireland, the Southern Ocean and off Cape Horn. Many wave energy devices are still in the research and development stage and would require large amounts of capital to get started. Additional costs from permitting and environmental assessments also make wave energy problematic (WEC 2007). Nonetheless, wave energy is likely to increase in use within the next 5 to 10 years.

The total power of waves breaking on the world's coastlines is estimated at 2 to 3 million MW. In favorable locations, wave energy density can average 65 MW per mile of coastline. Three approaches to capturing wave energy are:

- **Floats or Pitching Devices.** These devices generate electricity from the bobbing or pitching action of a floating object. The object can be mounted to a floating raft or to a device fixed on the ocean floor.
- **Oscillating Water Columns.** These devices generate electricity from the wave-driven rise and fall of water in a cylindrical shaft. The rising and falling water column drives air into and out of the top of the shaft, powering an air-driven turbine.
- **Wave Surge or Focusing Devices.** These shoreline devices, also called tapered channel or tapchan systems, rely on a shore-mounted structure to channel and concentrate the waves, driving them into an elevated reservoir. Water flow out of this reservoir is used to generate electricity, using standard hydropower technologies.

In December 2007, PG&E signed a power purchase agreement with Finavera Renewables, which had planned to operate a wave farm approximately 2.5 miles off the coast of Eureka, California. The agreement was for 2 MW of power beginning in 2012. On October 16, 2008, the California Public Utilities Commission rejected PG&E's request for approval of a renewable resource procurement contract with Finavery Renewables because, among other reasons, the CPUC concluded the project had not been shown to be viable. As stated in that decision, there is significant uncertainty surrounding wave technology and the wave energy industry is at a beginning stage (CPUC 2008). The CPUC did authorize up to $4.8 million for PG&E to undertake its WaveConnect project in Decision D.09-01-036. WaveConnect is designed to document the feasibility of a facility that converts wave energy into electricity by using wave energy conversion (WEC) devices in the open ocean adjacent to PG&E's service territory.

In January 2010, the California State Lands Commission and the Federal Energy Regulatory Commission issued a Request for Statements of Interest to prepare an environmental document for the PG&E WaveConnect project discussed above. PG&E has selected a wave energy project siting area that is between 2.5 and 3.0 nautical miles (nm) from the shore in Humboldt County. WaveConnect consists of: (1) wave energy converters (WECs) including multi-point catenary moorings and anchors; (2) marker buoys, navigation lights, and environmental monitoring instruments; (3) subsea electrical cables extending on-shore to (4) land-based power conditioning equipment; (5) an above-ground transmission line and interconnection to the electrical grid; (6) data acquisition and telemetry equipment; and (7) security and safety equipment.

Environmental Assessment. The environmental impacts of wave power have yet to be fully analyzed. A recent study published by the U.S. Department of Commerce and National Oceanic and Atmospheric Administration listed a number of potentially significant environmental impacts created by wave power (Boehlert 2008):

- Significant reduction to waves with possible effects to beaches (e.g. changes to sediment transport processes).
- The use of buoys may have positive effects on forage fish species, which in turn could attract larger predators. Structures need to be designed to reduce the potential entanglement of larger predators, especially marine turtle species.
- Modifications to water circulation and currents may result in changes to larval distribution and sediment transport.
- Wave energy development may affect community structures for fish and fisheries.
- Lighting and above-water structures may result in marine bird attraction and collisions and may alter food webs and beach processes.
- A diversity of concerns would arise regarding marine mammals including entanglement issues.
- Energy-absorbing structures may affect numerous receptors and should avoid sensitive habitats.
- Potential hazards from chemicals used in the process must be addressed both for spills and for a continuous release such as in fouling paints.

- New hard structures and lighting may break loose and increase debris accumulation.
- Impacts on fish and marine mammals caused by noise coming from the buoys should be understood and mitigated.
- Electromagnetic effects may affect feeding or orientation and should be better understood.
- Impact thresholds need to be established. As projects scale up in location or implementation, new risks may become evident.

Rationale for Elimination

Wave energy is new and may not be technologically feasible; as stated above, PG&E is proposing to sponsor a project to test the feasibility of harnessing wave energy. Additionally, wave power must be located where waves are consistently strong; even then, the production of power depends on the size of waves, which result in large differences in the amount of energy produced. Wave technology is not considered an alternative to the SES Solar Two project because is an unproven technology at the scale that would be required to replace the proposed project and because it may also result in substantial adverse environmental impacts. Therefore, this technology is not analyzed in detail in this SA/DEIS as an alternative to the Solar Two project.

B.2.8.4 ALTERNATIVE METHODS OF GENERATING OR CONSERVING ELECTRICITY

Nonrenewable generation technologies that require use of natural gas, coal, or nuclear energy would not achieve the key project objective for the proposed SES Solar Two project to provide clean, renewable, solar-powered electricity and to assist San Diego Gas & Electric (SDG&E) in meeting its obligations under California's Renewable Portfolio Standard Program.

While these generation technologies would not achieve this key objective, they are described briefly in this section to present this information to the public and decision makers. Conservation and demand-side management are also briefly addressed in this section.

The following topics were considered in this analysis:

- natural gas
- coal
- nuclear energy
- conservation and demand-side management

Of the three nonrenewable generation alternatives (natural gas, coal, and nuclear), only natural gas-fired power plants would be viable alternatives within California. However, gas-fired plants would fail to meet a major project objective to construct and operate a renewable power generating facility in California capable of selling competitively priced renewable energy consistent with the needs of California utilities and would therefore not achieve the purpose and need of the project. Because these alternatives would not

support renewable power generation within California, and could have significant environmental impacts of their own, they were eliminated from further consideration.

None of these non-renewable energy technologies would meet the BLM's purpose and need, which is to approve, modify, or deny the applicant's request for a right-of-way. These technologies would be too great a departure from the application to be considered a modification of the applicant's proposal

Natural Gas Generation

Natural gas power generation accounts for approximately 22% of all the energy used in the United States and comprises 40% of the power generated in California (CEC 2007). Natural gas power plants typically consist of combustion turbine generators, heat recovery steam generators, a steam turbine generator, wet or dry cooling towers, and associated support equipment. An interconnection with a natural gas pipeline, a water supply, and electric transmission are also required.

A gas-fired power plant generating 750 MW would generally require less than 80 acres of land.

Environmental Assessment. Natural gas power plants may result in numerous adverse environmental impacts such as the following.

- Overall air quality impacts would increase because natural gas-fired power plants can contribute to local violations of the PM10 and ozone air quality standards, and operational emissions could result in toxic air contaminants that could adversely affect sensitive receptors. Net increases in greenhouse gas emissions due to natural gas-firing in the conventional power plants would also be substantial.
- Environmental justice may be a concern. Gas-fired power plants tend to be located in developed urban areas that are zoned for heavy industry. In some instances, low-income and minority populations are also located in such areas.
- To avoid adverse land use impacts, natural gas-fired power plants must be consistent with local jurisdictions' zoning.
- Several hazardous materials, including regulated substances (aqueous ammonia, hydrogen, and sulfuric acid), would be stored at a natural gas power plant during operation. Aqueous ammonia would be stored in amounts above the threshold quantity during the final stages of construction, initial start-up, and operations phases. Transport of hazardous materials during power plant operation includes delivery of aqueous ammonia and removal of wastes. During operation, the aqueous ammonia transporter would be required to obtain a Hazardous Material Transportation License in accordance with California Vehicle Code Section 32105 and would be required to follow appropriate safety procedures and routes.
- Cultural impacts can be severe depending on the power plant siting; however, because natural gas power plants require substantially fewer acres per MW of power generated, impacts to cultural resources would be expected to be fewer than with solar facilities.
- Power plant siting may result in the permanent conversion of designated farmland to non-agricultural uses. However, because natural gas power plants require substantially

fewer acres per MW of power generated, impacts to designated farmlands would be expected to be less than with solar facilities.

- Visual impacts may occur with natural gas power plants because they introduce large structures with industrial character. The most prominent structures are frequently the cooling towers, which may reach 100 feet tall, and the power plant stacks, which may reach over 100 feet tall. Visible plumes from the cooling tower would also potentially occur.

Rationale for Elimination

Although natural gas generation is clearly a viable technology, it is not a renewable technology, so it would not attain the objective of generating renewable power meeting California's renewable energy needs. The air quality impacts of gas-fired plants include greenhouse gases and are one major reason that California's Renewable Portfolio Standard was developed. Therefore, this alternative is not considered in detail as an alternative to the SES Solar Two project and is not analyzed further in this SA/DEIS.

Coal Generation

Coal-fired electric generating plants are the cornerstone of America's electric power generation system. Traditional coal-fired plants generate large amounts of greenhouse gases. New clean coal technology includes a variety of energy processes that reduce air emissions and other pollutants from coal-burning power plants. The Clean Coal Power Initiative is providing government co-financing for new coal technologies that help utilities meet the Clear Skies Initiative to cut sulfur, nitrogen, and mercury pollutants by nearly 70% by 2018. The Clean Coal Power Initiative is now focusing on developing projects that use carbon sequestration technologies and/or beneficial reuse of carbon dioxide (DOE 2008). However, these technologies are not yet in use.

In 2006, approximately 15.7% of the energy used in California came from coal fired sources; 38% of this was generated in state, and 62% was imported (CEC 2007). The in-state coal-fired generation includes electricity generated from out-of-state, coal-fired power plants owned by and reported by California utilities (CEC 2007). In 2006, California enacted Senate Bill 1368 (Perata, Chapter 598, Statutes of 2006), which prohibits utilities from making long-term commitments for electricity generated from plants that create more carbon dioxide (CO_2) than clean-burning natural gas plants (CEC 2007).

Environmental Assessment. Coal-fired power plants may also result in numerous adverse environmental impacts such as the following.

- Overall, air quality impacts would increase because coal-fired power plants contribute carbon dioxide, sulfur dioxide, nitrogen oxides, mercury, and fly ash (USEPA 2008a). Mining, cleaning, and transporting coal to the power plants generates additional emissions. Average per megawatt hour emissions of a coal-fired power plant are 2,249 pounds of carbon dioxide, 13 pounds of sulfur dioxide and 6 pounds of nitrogen oxides (EPA 2008a). Net increases in greenhouse gas emissions due to coal-firing in conventional power plants would be significant.

- Health risks associated with power plants have also been documented, including problems associated with exposure to fine particle pollution or soot, an increase in asthma, and an increase in non-fatal heart attacks.
- Large quantities of water are generally required to produce steam and for cooling. When coal-fired power plants use water from a lake or river, fish or other aquatic life can be adversely impacted (EPA 2008).

Rationale for Elimination

Although coal generation is a viable technology, it is not a renewable technology, so it would not attain the objective of generating renewable power meeting California's renewable energy needs. Existing technology for coal-fired plants results in high greenhouse gas emissions. Therefore, coal generation was eliminated from detailed analysis and is not considered further in this SA/DEIS.

Nuclear Energy

Due to environmental and safety concerns, California law currently prohibits the construction of new nuclear power plants in the state until the California Energy Commission finds that the federal government has approved and there exists a demonstrated technology for the permanent disposal of spent fuel from these facilities (CEC 2006). In June 1976, California enacted legislation directing the Energy Commission to perform an independent investigation of the nuclear fuel cycle. This investigation was to assess whether the technology to reprocess nuclear fuel rods or to permanently dispose of high-level nuclear waste had been demonstrated and approved and was operational (Public Resources Code 25524.1 (a) (1), 25524.1 (b), and 25524.2 (a)). After extensive public hearings, the Energy Commission determined that it could not make the requisite affirmative findings concerning either reprocessing of nuclear fuel or disposal of high-level waste as documented in the *Status of Nuclear Fuel Reprocessing, Spent Fuel Storage and High-level Waste Disposal*, Energy Commission publication P102-78-001 (January 1978.) As a result, the development of new nuclear energy facilities in California was prohibited by law.

It has been more than 25 years since the last comprehensive Energy Commission assessment of nuclear power issues. The *Nuclear Power in California: 2007 Status Report* (October 2007) provides a detailed description of the current nuclear waste issues and their implications for California. This was prepared as part of the development of the Energy Commission's *2007 Integrated Energy Policy Report* (CEC 2007a).

Rationale for Elimination

The permitting of new nuclear facilities in California is currently illegal, so this technology is infeasible and is not considered further in this SA/DEIS.

Conservation and Demand-Side Management

Conservation and demand-side management consist 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. In 2005 the Energy Commission and CPUC's Energy Action Plan II declared cost effective energy efficiency as the resource of first choice for meeting California's energy needs. The Energy

Commission noted that energy efficiency has helped flatten the state's per capita electricity use and saved consumers more than $56 billion since 1978 (CPUC 2008). The investor-owned utilities' 2006-2008 efficiency portfolio marks the single-largest energy efficiency campaign in U.S. history, with a $2 billion investment by California's energy ratepayers (CPUC 2008). However, with population growth, increasing demand for energy, and the need to reduce greenhouse gases, there is a greater need for energy efficiency.

The CPUC, with support from the Governor's Office, the Energy Commission, and the California Air Resources Board, among others, adopted the *California Long-Term Energy Efficiency Strategy Plan for 2009 to 2020* (CPUC September 2008). The plan is a framework for all sectors in California including industry, agriculture, large and small businesses, and households. Major goals of the plan include:

- All new residential construction will be zero net energy by 2020;
- All new commercial construction will be zero net energy by 2030;
- Heating, ventilation, and air conditioning industries will be re-shaped to deliver maximum performance systems;
- Eligible low-income customers will be able to participate in the Low Income Energy Efficiency program and will be provided with cost-effective energy efficiency measures in their residences by 2020.

Rationale for Elimination

Conservation and demand-side management are 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 are 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, so technologies, like solar thermal generation, would be required. Therefore, they are not analyzed in detail in this SA/DEIS as an alternative to the Solar Two project.

B.2.8.5 AVOIDANCE OF WATERS OF THE U.S. ALTERNATIVE

The Avoidance of Waters of the U.S. alternative was developed by the U.S. Army Corps of Engineers (Corps), and would require avoidance of all permanent effects on waterways within the SES Solar Two proposed site. All drainages have been determined to be under the jurisdiction of the Corps. This would include both "primary" and "secondary" streams as defined by the Corps. This alternative is illustrated in **Alternatives Figure 9**, in which the blackened areas show where SunCatchers would not be allowed.

The Avoidance of the Waters of the U.S alternative would allow limited crossings of waterways by roads and electric collection system lines, but would not allow any permanent facilities (i.e., SunCatchers) to be installed within the boundaries of waters of the U.S. Primary and secondary streams are located throughout the SES Solar Two proposed site. As a result, the alternative would allow development only in the center section of the project area, shown in yellow and gray on **Alternatives Figure 9**.

According to the applicant's consultants, the Avoidance of Waters of the U.S. alternative would result in elimination of 6,580 SunCatchers that are proposed to be located in drainages, but would isolate an additional 19,976 SunCatchers, making them infeasible to construct and operate. There would remain about 3,444 SunCatchers (retaining only about 10% of the proposed SunCatchers. Permanent structures would be allowed in only about 10% of the proposed project site. Streams crossed in order to provide access to the remaining developable portion of the site would be protected from erosion and sedimentation by use of "Arizona crossings" (crossings with no culverts) or "bottomless culverts."

Environmental Assessment

The Avoidance of Waters of the U.S. alternative would require substantially less land than the proposed project, reducing the developed area by about 90%. As a result, impacts would be substantially reduced.

Soil and Water. Because permanent structures would not be allowed within the primary and secondary streams, this alternative would substantially reduce impacts to waters of the U.S. The many primary and secondary streams in the project area provide beneficial functions and values such as groundwater recharge, flood peak attenuation and floodwater conveyance, and wildlife habitat. Most of these functions would remain relatively unimpaired by construction and operation of the SES Solar Two project in this alternative because of the elimination of permanent structures within the streams themselves. This would maintain flow where possible with water exiting the site within existing natural drainages.

While no permanent structures would be allowed within primary and secondary streams all of the ephemeral drainages on the SES Solar Two project area are potentially vulnerable to soil and vegetation disturbance as a result of road construction and electric gathering line crossings, use of the construction logistics area, and construction of linear facilities, as well as ongoing vegetation maintenance, weed control, and other maintenance activities associated with project operation.

Biological Resources. The existing drainages currently support undisturbed native plant communities that help stabilize stream banks and provide valuable wildlife habitat and wildlife movement corridors. The Avoidance of the Waters of the U.S. alternative would not directly disturb these drainages, but it would fragment the area by allowing extensive construction activities within the alternative boundaries. As a result, this alternative would degrade the beneficial functions and values that these waters provide to wildlife. Fencing the project, even at the smaller size, could still effectively remove the connectivity value of the washes for wildlife use.

Other Resources. The Avoidance of Waters of the U.S. alternative would be located within the same project boundaries as the proposed project (but with substantially fewer SunCatchers). It would require fencing of a much smaller footprint, construction of many fewer roads, and only about 10% of the SunCatchers. Therefore, impacts to air quality, cultural resources, land use, recreation, and noise would be reduced substantially. Given the remaining size of the overall facility and the installation of approximately 3,440 40-foot-tall SunCatchers, visual impacts would remain considerable and similar to those at the proposed SES Solar Two site.

Rationale for Elimination

The Avoidance of the Waters of the U.S. alternative was developed in order to satisfy the requirements of the U.S. Army Corps of Engineers to evaluate alternatives that minimize project effects on Waters of the U.S. This alternative would eliminate permanent structures within the primary and secondary drainages within the project boundary, substantially reducing impacts to all resource areas. However, this alternative would allow generation of less than 100 MW, which does not meet the project objectives or purpose and need for the project. Therefore, the alternative has been eliminated from detailed analysis.

B.2.9 CONCLUSIONS OF ALTERNATIVES ANALYSIS

In this analysis of the SES Solar Two project, 27 alternatives to the proposed Solar Two project were developed and evaluated. These include eight alternative sites, solar and renewable technologies, generation technologies using different fuels, conservation/ demand-side management, and a 300 MW alternative to the proposed 750 MW proposed project. Of the 27 alternatives, four alternatives were determined to be feasible by the Bureau of Land Management (BLM) and the Energy Commission and have the potential to result in reduced impacts in comparison with the proposed project: the 300 MW alternative, two alternatives that would reduce impacts to waters of the United States, and the No Project/No Action alternative.

Three of the eight site alternatives are evaluated in detail by the Energy Commission and evaluated in this SA/DEIS under the California Environmental Quality Act (CEQA) only: the Mesquite Lake Alternative site, Agricultural Lands Alternative site, and South of Highway 98 Alternative site. While the impacts of these three sites would be similar to those of the proposed site in many resource elements, all three sites are likely to have less severe cultural and visual impacts, and two of the three (located on disturbed lands) would also have reduced impacts to biological resources.

All eight site alternatives are considered unreasonable by the BLM because they would not meet BLM's Purpose and Need which is to respond to the applicant's request for a right-of-way by granting, granting a modified, or not granting the right of way, or are otherwise unreasonable alternatives under NEPA as discussed above..

Alternative solar thermal technologies (parabolic trough, solar power tower, utility scale solar photovoltaics, and linear Fresnel) were also evaluated. As compared with the proposed Solar Two technology, these technologies would not substantially change the severity of visual, biological resources and cultural resources impacts, although the land requirements vary among the technologies. Rooftop solar PV facilities would require extensive acreage although it would minimize the need for undisturbed or vacant land. However, increased deployment of rooftop solar PV faces challenges in manufacturing capacity, cost, and policy implementation. These alternatives also do not meet the BLM's purpose and need because they would be too great a departure from the application to be considered a modification of the application.

Other generation technologies (wind, geothermal, biomass, tidal, wave, natural gas, and nuclear) were also examined as possible alternatives to the proposed Solar Two project.

These technologies would either be infeasible at the scale of the Solar Two project, or would not eliminate substantial adverse impacts caused by the Solar Two project without creating their own substantial adverse impacts in other locations. These alternatives also do not meet the BLM's purpose and need because they would be too great a departure from the application to be considered a modification of the application. A natural gas plant would contribute to greenhouse gas emissions and would not meet the project's renewable generation objective. Construction of new nuclear power plants is currently prohibited under California law.

Conservation and demand side management programs would likely not meet the state's growing electricity needs that could be served by the Solar Two project. In addition, these programs would not provide the renewable energy required to meet the California Renewable Portfolio Standard requirements.

CEC Staff also concludes that the No Project/No Action alternative is not superior to the proposed project. This alternative would likely delay development of renewable resources or shift renewable development to other similar areas, and would lead to increased operation of existing power plants that use non-renewable technologies.

The 300 MW Alternative and the two Drainage Avoidance Alternatives would substantially reduce impacts in comparison to the proposed project. These alternatives would meet the project objectives (though reducing the generation capacity), but would not attain the purpose and need for the project.

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Appendix ALTS-1 – LESA Model Worksheets

The California Agricultural LESA Model is composed of six different factors. Two "Land Evaluation" factors are based upon measures of soil resource quality. Four "Site Assessment" factors provide measures of a given project's size, water resource availability, surrounding agricultural lands, and surrounding protected resource lands. For a given project, each of these factors is separately rated on a 100 point scale. The factors are then weighted relative to one another and combined, resulting in a single numeric score for a given project, with a maximum attainable score of 100 points. It is this project score that becomes the basis for making a determination of a project's potential significance, based upon a range of established scoring thresholds. The California Agricultural LESA Instruction Manual found at the California Department of Conservation, Division of Land Resource Protection website provides detailed instructions on how to complete the LESA worksheet.

Calculation of the Land Evaluation (LE) Score

Part 1. Land Capability Classification (LCC) Score

(1) Determine the total acreage of the project.
(2) Determine the soil types within the project area and enter them in **Column A** of the **Land Evaluation Worksheet** provided on page A-2.
(3) Calculate the total acres of each soil type and enter the amounts in **Column B**.
(4) Divide the acres of each soil type (**Column B**) by the total acreage to determine the proportion of each soil type present. Enter the proportion of each soil type in **Column C**.
(5) Determine the LCC for each soil type from the applicable Soil Survey and enter it in **Column D**
(6) From the LCC Scoring Table below, determine the point rating corresponding to the LCC for each soil type and enter it in **Column E**.

LCC Scoring Table

LCC Class	I	IIe	IIs, w	IIIe	IIIs, w	IVe	IVs, w	V	VIe, s, w	VIIe, s, w	VIII
Points	**100**	**90**	**80**	**70**	**60**	**50**	**40**	**30**	**20**	**10**	**0**

(7) Multiply the proportion of each soil type (**Column C**) by the point score (**Column E**) and enter the resulting scores in **Column F**.
(8) Sum the LCC scores in **Column F**.
(9) Enter the LCC score in box <1> of the Final LESA Score Sheet on page A-10.

Part 2. Storie Index Score

(1) Determine the Storie Index rating for each soil type and enter it in **Column G**.
(2) Multiply the proportion of each soil type (**Column C**) by the Storie Index rating (**Column G**) and enter the scores in **Column H**.
(3) Sum the Storie Index scores in **Column H** to gain the Storie Index Score.
(4) Enter the Storie Index Score in box <2> of the Final LESA Score Sheet on page A-10.

Land Evaluation Worksheet
Land Capability Classification (LCC) and Storie Index Scores

A	B	C	D	E	F	G	H
Soil Map Unit	Project Acres	Proportion of Project Area	LCC	LCC Rating	LCC Score	Storie Index	Storie Index Score
101	205.3	0.117	7e	10	1.17	90	10.50
102	6.9	0.004	N/A	0	0.00	N/A	0.00
110	1.3	0.001	7w	10	0.01	50	0.04
119	15.4	0.009	7e	10	0.09	90	0.79
120	165.3	0.094	7e	10	0.94	N/A	0.00
121	41.3	0.023	7e	10	0.23	30	0.70
124	49	0.028	7e	10	0.28	30	0.84
126	2.6	0.001	7e	10	0.01	30	0.04
127	197.8	0.112	7e	10	1.12	50	5.62
130	551.1	0.313	7e	10	3.13	50	15.66
132	104	0.059	7e	10	0.59	50	2.96
138	417.7	0.237	7e	10	2.37	70	16.62
142	1.7	0.001	7w	10	0.01	70	0.07
Totals	**1,759.40**	**1.00**		***LCC Total Score***	**9.96**	***Storie Index Total Score***	**53.84**

(Must Sum To 1.0)

Site Assessment Worksheet 1.
Project Size Score

	I	J	K
	LCC Class I - II	LCC Class III	LCC Class IV- VIII
			205.3
			N/A
			1.3
			15.4
			165.3
			41.3
			49
			2.6
			197.8
			551.1
			104
			417.7
			1.7
Total Acres			**1752.5**
Project Size Scores			**100**
Highest Project Size Score		**100**	

Calculation of the Site Assessment (SA) Score

Part 1. Project Size Score

(1) Using **Site Assessment Worksheet 1** provided on page A-2, enter the acreage of each soil type from **Column B** in the **Column I, J or K** that corresponds to the LCC for that soil. (Note: While the Project Size Score is a component of the Site Assessment calculations, the score sheet is an extension of data collected in the Land Evaluation Worksheet, and is therefore displayed beside it.)
(2) Sum **Column I** to determine the total amount of class I and II soils on the project site.
(3) Sum **Column J** to determine the total amount of class III soils on the project site.
(4) Sum **Column K** to determine the total amount of class IV and lower soils on the project site.
(5) Compare the total score for each LCC group in the Project Size Scoring Table below and determine which group receives the highest score.

Project Size Scoring Table

Class I or II			**Class III**			**Class IV or Lower**	
Acreage	Points		Acreage	Points		Acreage	Points
>80	100		>160	100		>320	100
60-79	90		120-159	90		240-319	80
40-59	80		80-119	80		160-239	60
20-39	50		60-79	70		100-159	40
10-19	30		40-59	60		40-99	20
10<	0		20-39	30		40<	0
			10-19	10			
			10<	0			

(6) Enter the **Project Size Score** (the highest score from the three LCC categories) in box <3> of the Final LESA Score Sheet on page A-10.

Part 2. Water Resource Availability Score

(1) Determine the type(s) of irrigation present on the project site, including a determination of whether there is dry land agricultural activity as well.

(2) Divide the site into portions according to the type or types of irrigation or dry land cropping that is available in each portion. Enter this information in **Column B** of **Site Assessment Worksheet 2 - Water Resources Availability** provided on page A-5.

(3) Determine the proportion of the total site represented for each portion identified, and enter this information in **Column C**.

(4) Using the Water Resources Availability Scoring Table provided on page A-6, identify the option that is most applicable for each portion, based upon the feasibility of irrigation in drought and non-drought years, and whether physical or economic restrictions are likely to exist. Enter the applicable Water Resource Availability Score into **Column D**.

(5) Multiply the Water Resource Availability Score for each portion by the proportion of the project area it represents to determine the weighted score for each portion in **Column E**.

(6) Sum the scores for all portions to determine the project's total Water Resources Availability Score.

(7) Enter the Water Resource Availability Score in box <4> of the Final LESA Score Sheet on page A-10.

Site Assessment Worksheet 2.
Water Resource Availability

A	B	C	D	E
Project Portion	Water Source	Proportion of Project Area	Water Availability Score	Weighted Availability Score (C x D)
1	Colorado River Basin	1	0	0
2				
3				
4				
5				
6				
		1.00	***Total Water Resource Score***	**0.00**
		(Must Sum to 1.0)		

Water Resource Availability Scoring Table

Option	Non-Drought Years				Drought Years			WATER RESOURCE SCORE
	RESTRICTIONS				RESTRICTIONS			
	Irrigated Production Feasible?	Physical Restrictions ?	Economic Restrictions ?		Irrigated Production Feasible?	Physical Restrictions ?	Economic Restrictions?	
1	YES	NO	NO		YES	NO	NO	100
2	YES	NO	NO		YES	NO	YES	95
3	YES	NO	YES		YES	NO	YES	90
4	YES	NO	NO		YES	YES	NO	85
5	YES	NO	NO		YES	YES	YES	80
6	YES	YES	NO		YES	YES	NO	75
7	YES	YES	YES		YES	YES	YES	65
8	YES	NO	NO		NO	_ _	_ _	50
9	YES	NO	YES		NO	_ _	_ _	45
10	YES	YES	NO		NO	_ _	_ _	35
11	YES	YES	YES		NO	_ _	_ _	30
12	Irrigated production not feasible, but rainfall adequate for dry land production in both drought and non-drought years.							25
13	Irrigated production not feasible, but rainfall adequate for dry land production in non-drought years but not in drought years).							20
14	Neither irrigated nor dry land production feasible.							0

Part 3. Surrounding Agricultural Land Use Score

(1) Calculate the project's Zone of Influence (ZOI) as follows:

(a) a rectangle is drawn around the project such that the rectangle is the smallest that can completely encompass the project area.

(b) a second rectangle is then drawn which extends one quarter mile (1,320 feet) on all sides beyond the first rectangle.

(c) The ZOI includes all parcels that are contained within or are intersected by the second rectangle, less the area of the project itself.

(2) Sum the area of all parcels to determine the total acreage of the ZOI.

(3) Determine which parcels are in agricultural use and sum the areas of these parcels.

(4) Divide the area in agriculture found in step (3) by the total area of the ZOI found in step (2) to determine the percent of the ZOI that is in agricultural use.

(5) Determine the Surrounding Agricultural Land Score utilizing the Surrounding Agricultural Land Scoring Table below.

Surrounding Agricultural Land Scoring Table

Percent of ZOI in Agriculture	Surrounding Agricultural Land Score
90-100	100
80-89	95
70-79	90
65-69	85
60-64	80
55-59	70
50-54	60
45-49	50
40-44	40
35-39	30
30-34	20
20-29	10
<19	0

(6) Enter the Surrounding Agricultural Land Score in box <5> of the Final LESA Score Sheet on page A-10.

Part 4. Surrounding Protected Resource Land Score

The Surrounding Protected Resource Land scoring relies upon the same Zone of Influence information gathered in Part 3, and figures are entered in Site Assessment Worksheet 3, which combines the surrounding agricultural and protected lands calculations.

(1) Use the total area of the ZOI calculated in Part 3 for the Surrounding Agricultural Land Use score.

(2) Sum the area of those parcels within the ZOI that are protected resource lands, as defined in the LESA Instruction Manual (e.g., Williamson Act contracted lands, publicly owned lands maintained as park, forest, or watershed resources).

(3) Divide the area that is determined to be protected in step (2) by the total acreage of the ZOI to determine the percentage of the surrounding area that is under resource protection.

(4) Determine the Surrounding Protected Resource Land Score utilizing the Surrounding Protected Resource Land Scoring Table below.

Surrounding Protected Resource Land Scoring Table

Percent of ZOI Protected	Protected Resource Land Score
90-100	100
80-89	95
70-79	90
65-69	85
60-64	80
55-59	70
50-54	60
45-49	50
40-44	40
35-39	30
30-34	20
20-29	10
<20	0

(5) Enter the Surrounding Protected Resource Land score in box <6> of the Final LESA Score Sheet on page A-10.

Site Assessment Worksheet 3.
Surrounding Agricultural Land and Surrounding Protected Resource Land

A	B	C	D	E	F	G
Zone of Influence					Surrounding Agricultural Land Score (from table on page A-7)	Surrounding Protected Resource Land Score (from table on page A-8)
Total Acres	Acres in Agriculture	Acres of Protected Resource Land	Percent in Agriculture (B/A)	Percent Protected Resource Land (C/A)		
10,900	160	0	1%	0	0	0

* The total number and percentage of acres in agriculture are based on the March 20, 2008 letter (pg. 3) from the San Luis Obispo County Agriculture Department, which states their LESA model assumed that surrounding agriculture is >90%.

Final LESA Score Sheet

Calculation of the Final LESA Score

(1) Multiply each factor score by the factor weight to determine the weighted score and enter in Weighted Factor Scores column.
(2) Sum the weighted factor scores for the LE factors to determine the total LE score for the project.
(3) Sum the weighted factor scores for the SA factors to determine the total SA score for the project.
(4) Sum the total LE and SA scores to determine the Final LESA Score for the project.

		Factor Scores	Factor Weight	Weighted Factor Scores
LE Factors				
Land Capability Classification (see page A-2)	<1>	9.96	0.25	2.49
Storie Index Rating (see page A-2)	<2>	53.84	0.25	13.46
LE Subtotal			**0.50**	**15.95**
SA Factors				
Project Size (see page A-2)	<3>	100	0.15	15
Water Resource Availability (see page A-5)	<4>	0	0.15	0
Surrounding Agricultural Land (see page A-9)	<5>	0	0.15	0
Surrounding Protected Resource Land (see page A-9)	<6>	0	0.05	0
SA Subtotal			**0.50**	**15**
			Final LESA Score	**30.95**

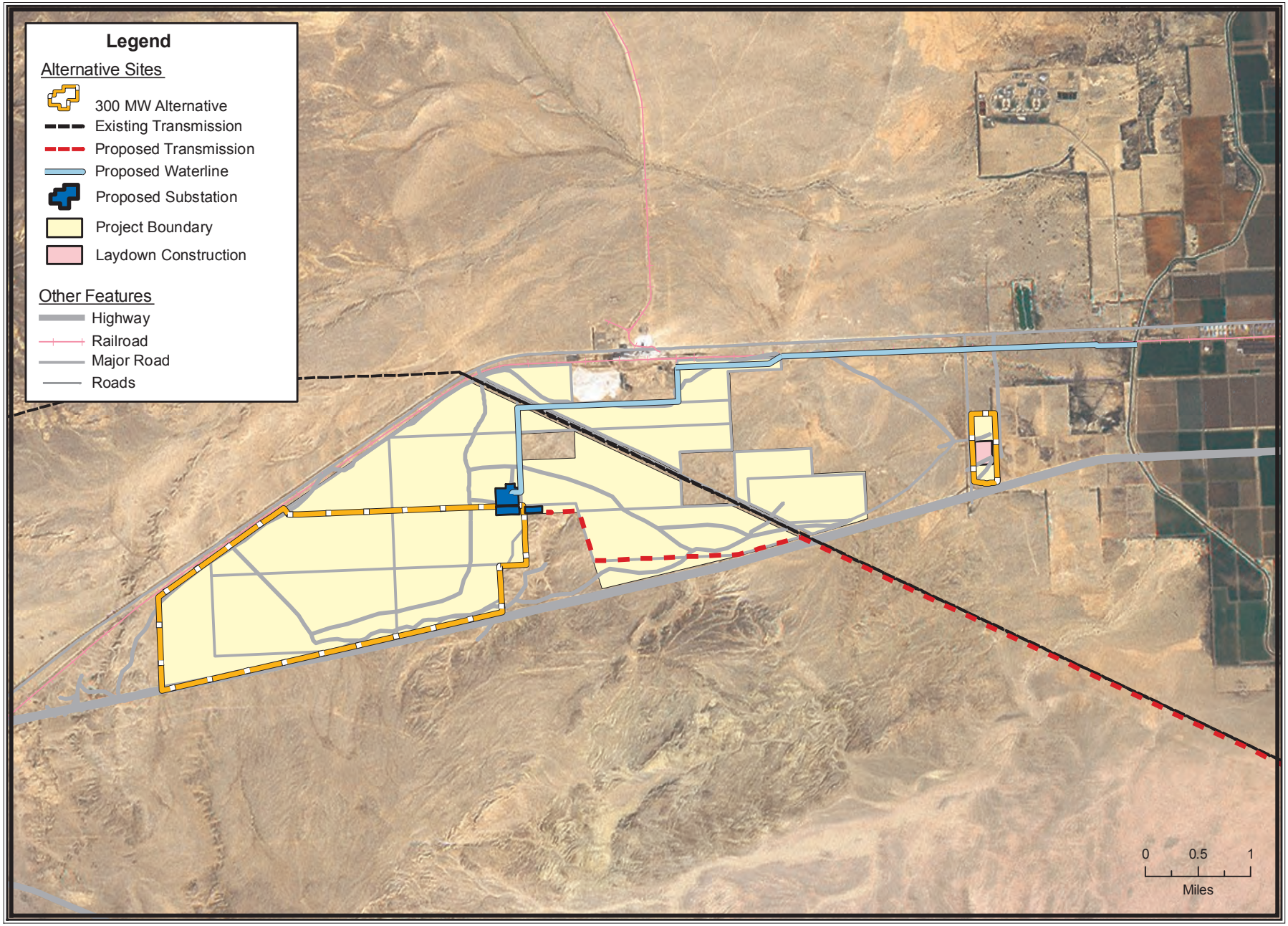
California Agricultural LESA Scoring Thresholds

Total LESA Score		Scoring Decision
0 to 39 points		Not Considered Significant
40 to 59 points		Considered Significant only if LE and SA subscores are each greater than or equal to 20 points
60 to 79 points		Considered Significant unless either LE or SA subscore is less than 20 points
80 to 100 points		Considered Significant

The California Agricultural LESA Model is designed to make determinations of the potential significance of a project's conversion of agricultural lands during the Initial Study phase of the CEQA review process. Scoring thresholds are based upon both the total LESA score as well the component LE and SA subscores. In this manner the scoring thresholds are dependent upon the attainment of a minimum score for the LE and SA subscores so that a single threshold is not the result of heavily skewed subscores (i.e., a site with a very high LE score, but a very low SA score, or vice versa). For additional information on the significance scoring thresholds under the California Agricultural LESA Model, consult Section 4 in the LESA Instruction Manual.

ALTERNATIVES - FIGURE 1A

SES Solar 2 - 300 MW Alternative

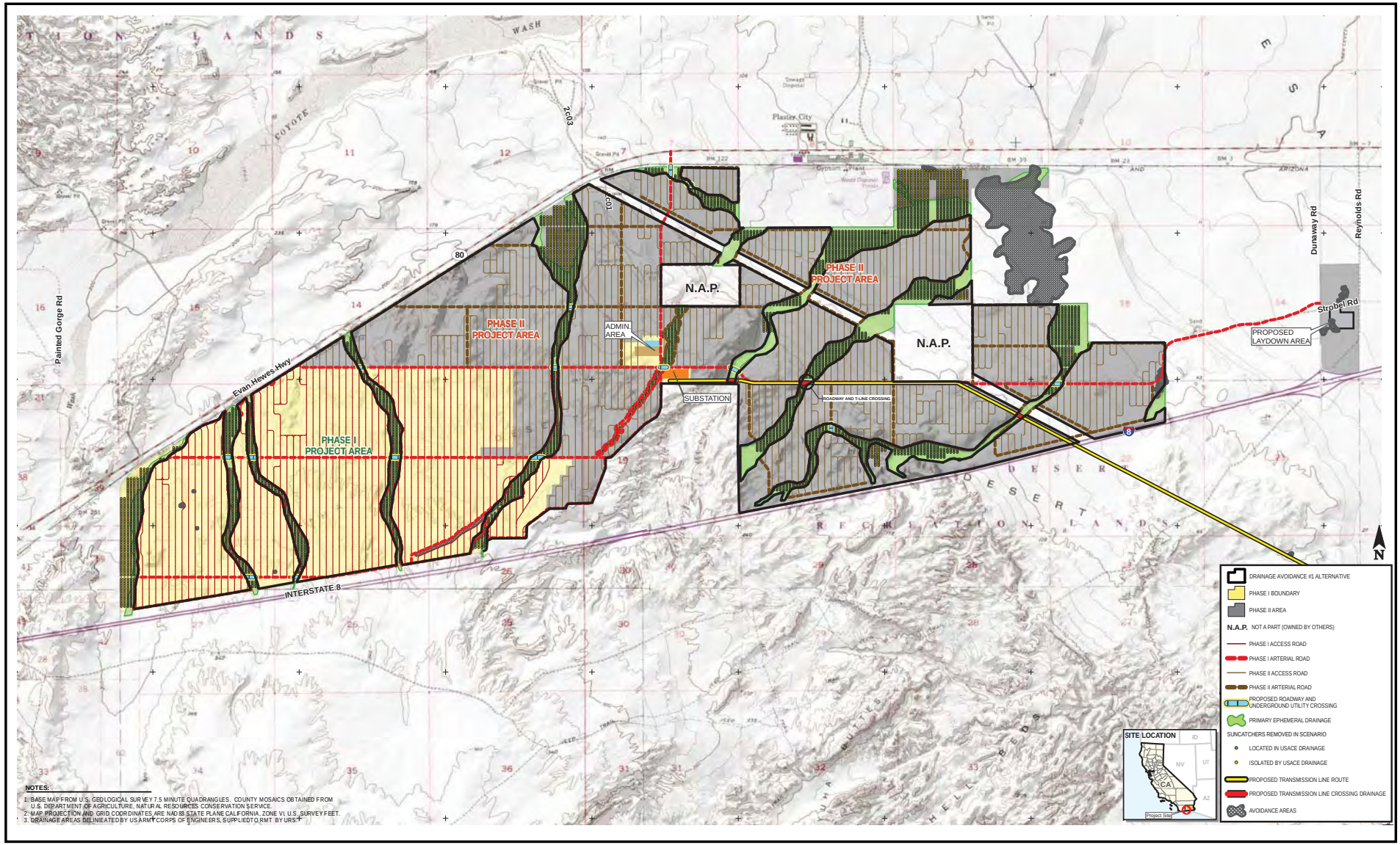


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, FEBRUARY 2010

SOURCE: California Energy Commission

ALTERNATIVES - FIGURE 1B

SES Solar 2 - Drainage Avoidance #1 Alternative

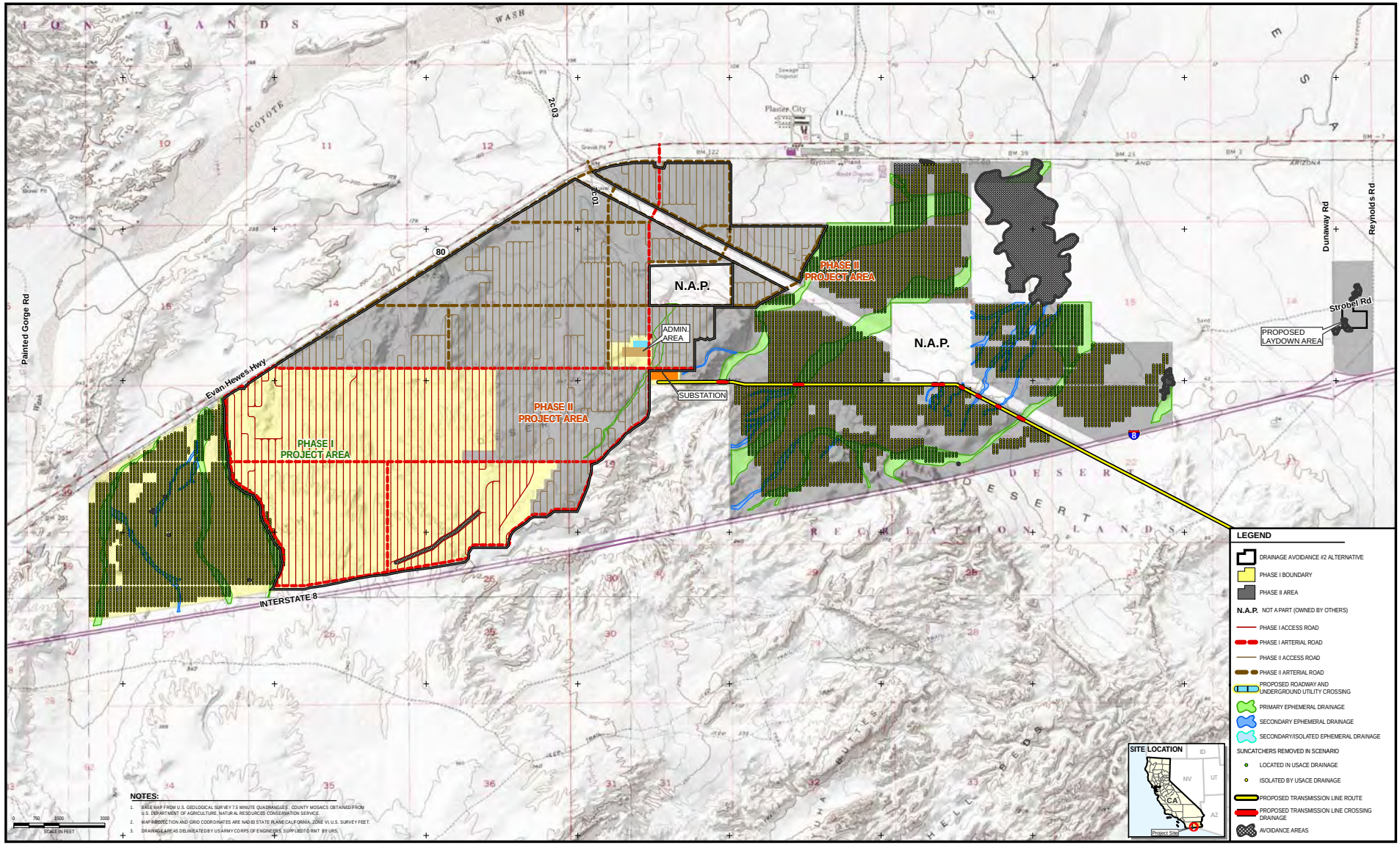


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, FEBRUARY 2010

SOURCE: RMT, December 2009

ALTERNATIVES - FIGURE 1C

SES Solar 2 - Drainage Avoidance #2 Alternative

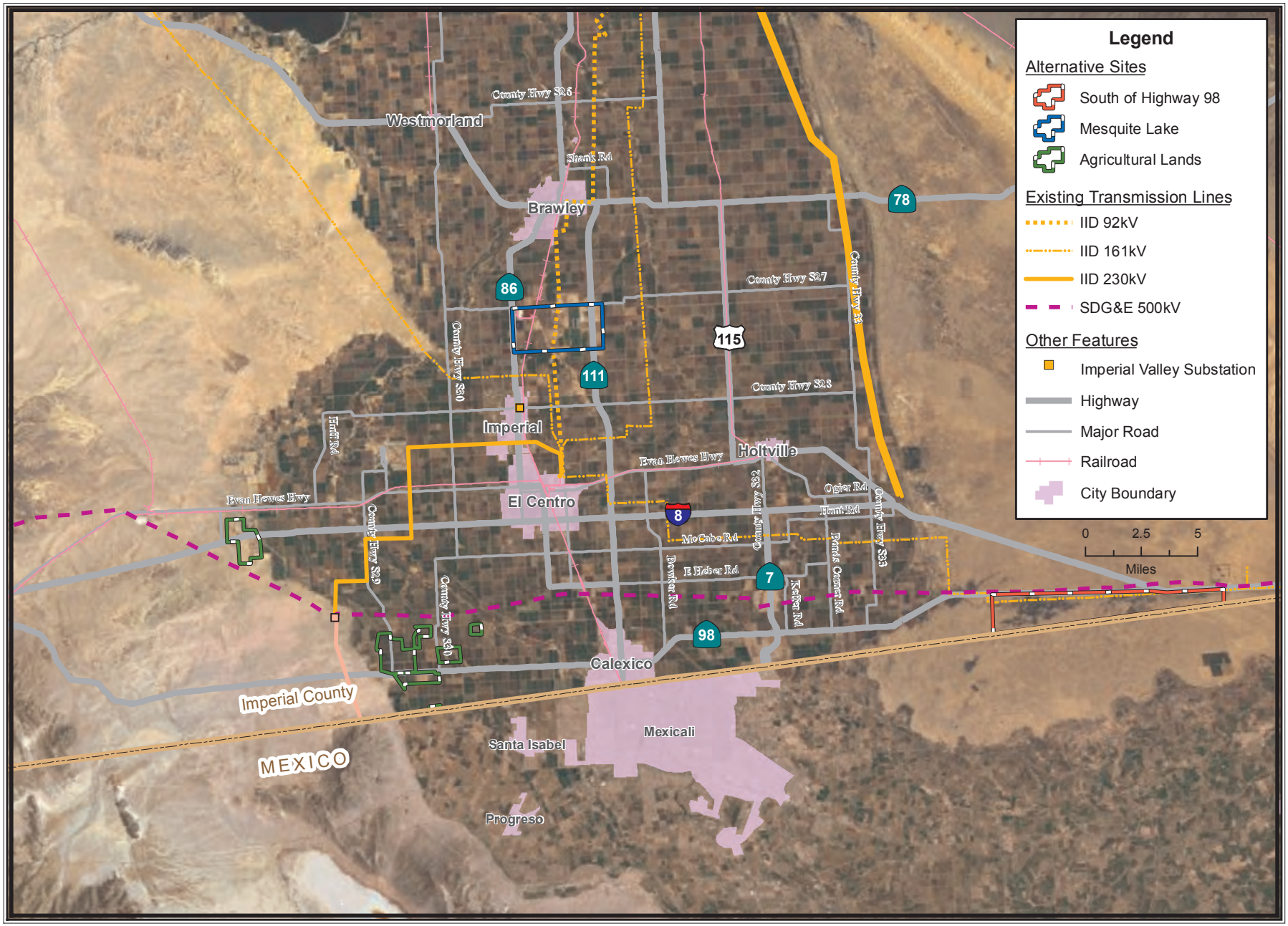


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, FEBRUARY 2010

SOURCE: RMT, December 2009

ALTERNATIVES - FIGURE 2

SES Solar 2 - Site Alternatives Evaluated under CEQA

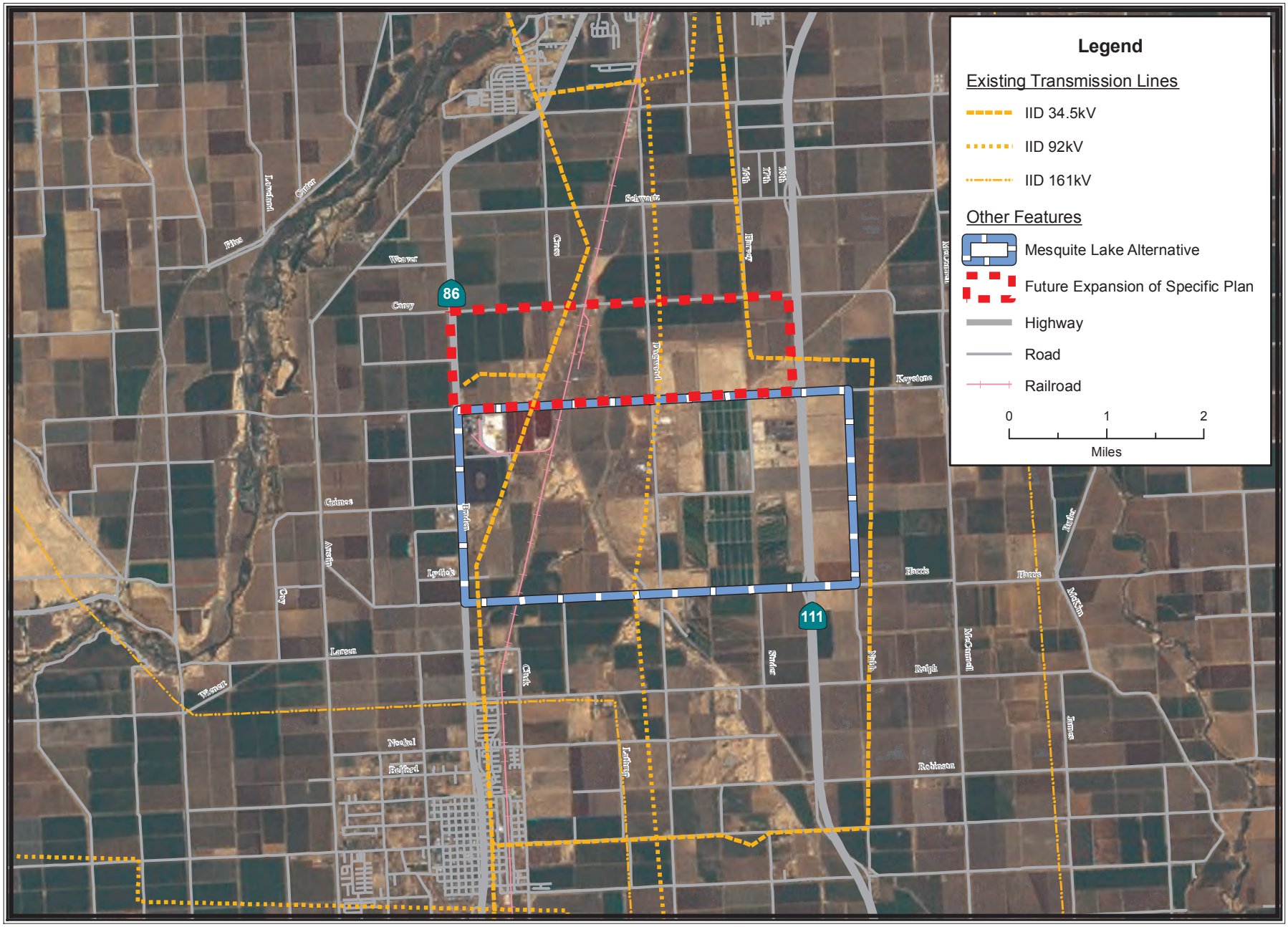


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, FEBRUARY 2010

SOURCE: California Energy Commission

ALTERNATIVES - FIGURE 3

SES Solar 2 - Mesquite Lake Alternative

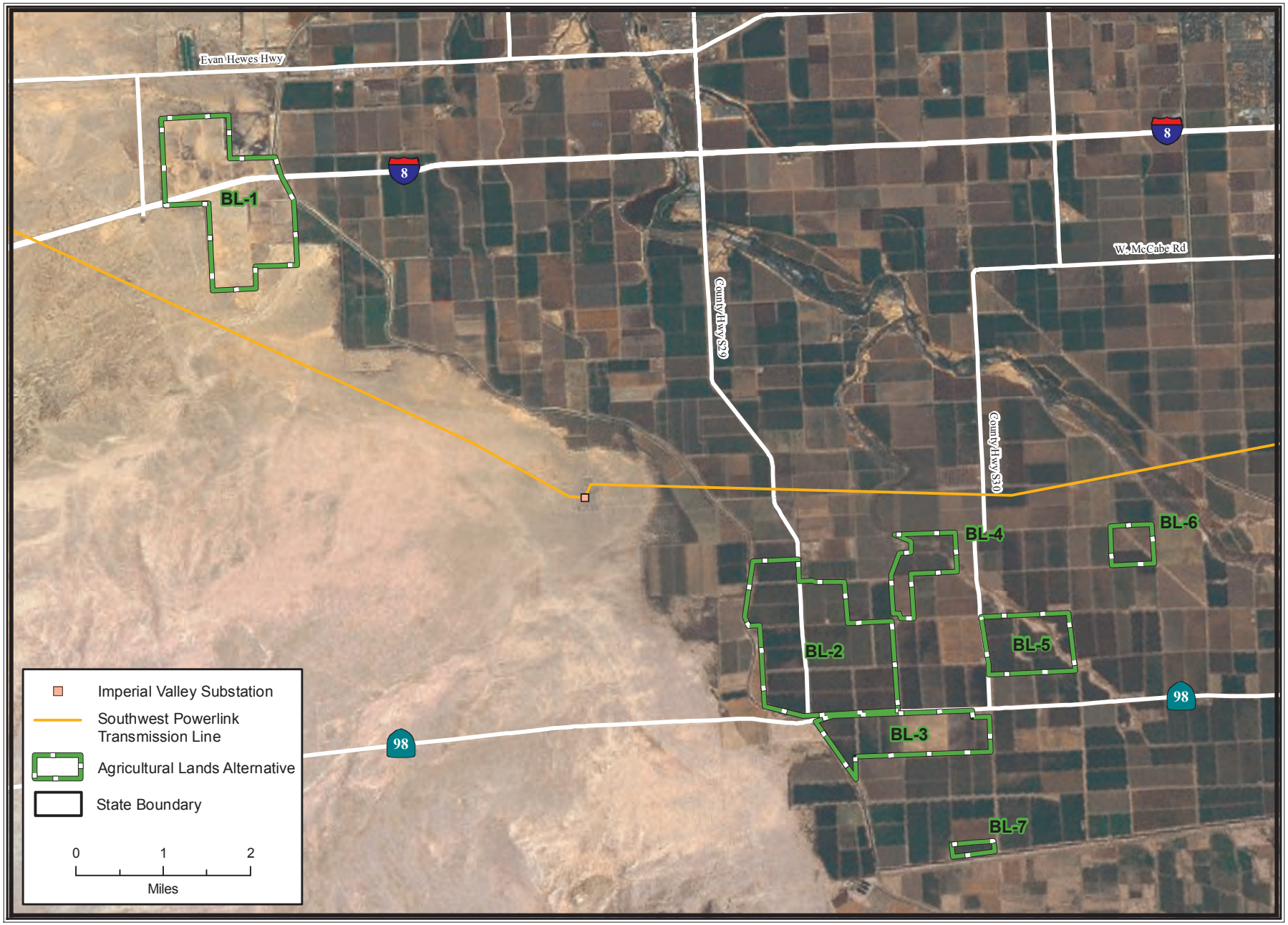


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, FEBRUARY 2010

SOURCE: California Energy Commission

ALTERNATIVES - FIGURE 4

SES Solar 2 - Agricultural Lands Alternative

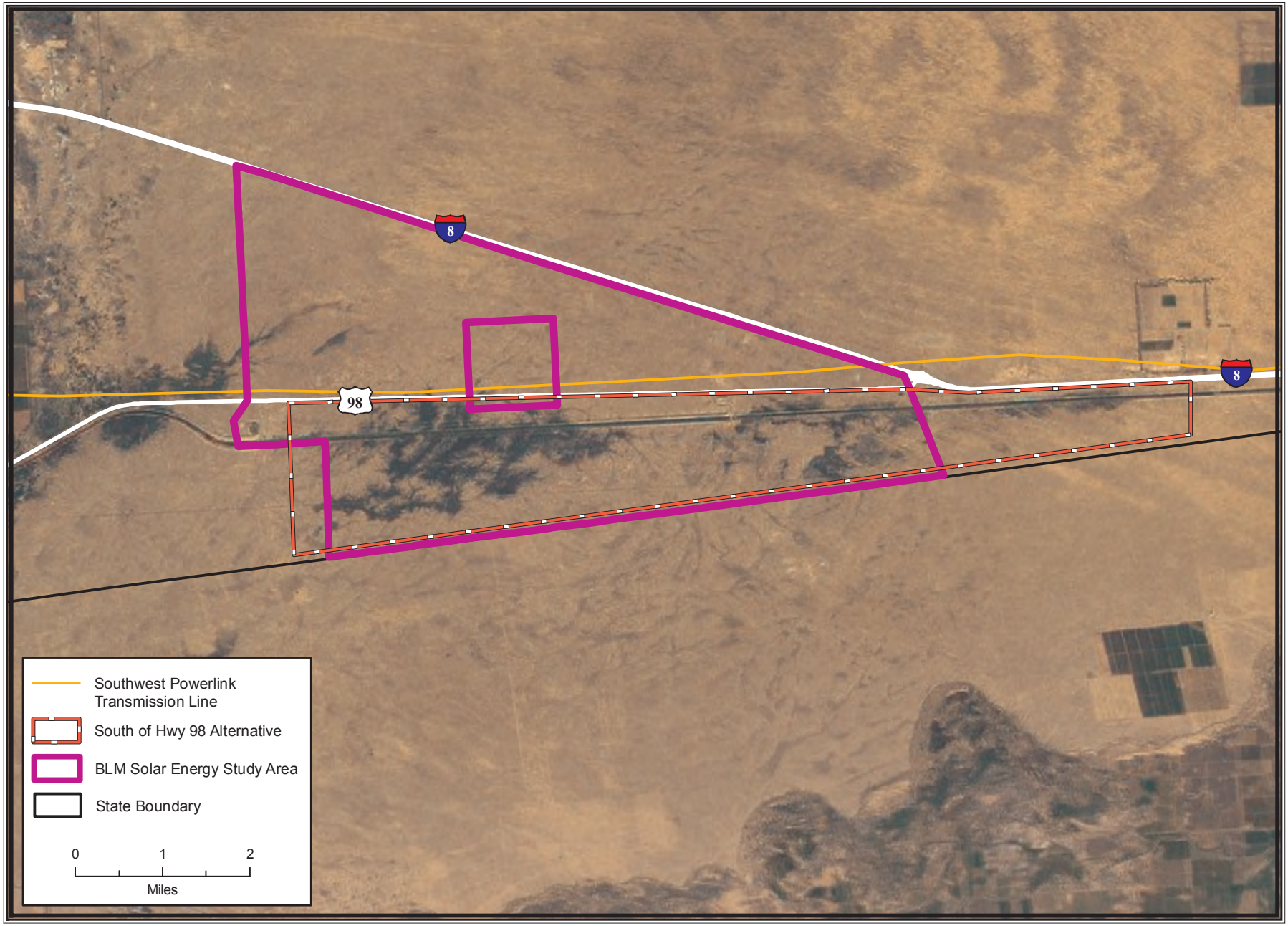


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, FEBRUARY 2010

SOURCE: California Energy Commission

ALTERNATIVES - FIGURE 5

SES Solar 2 - South of Hwy 98 Alternative

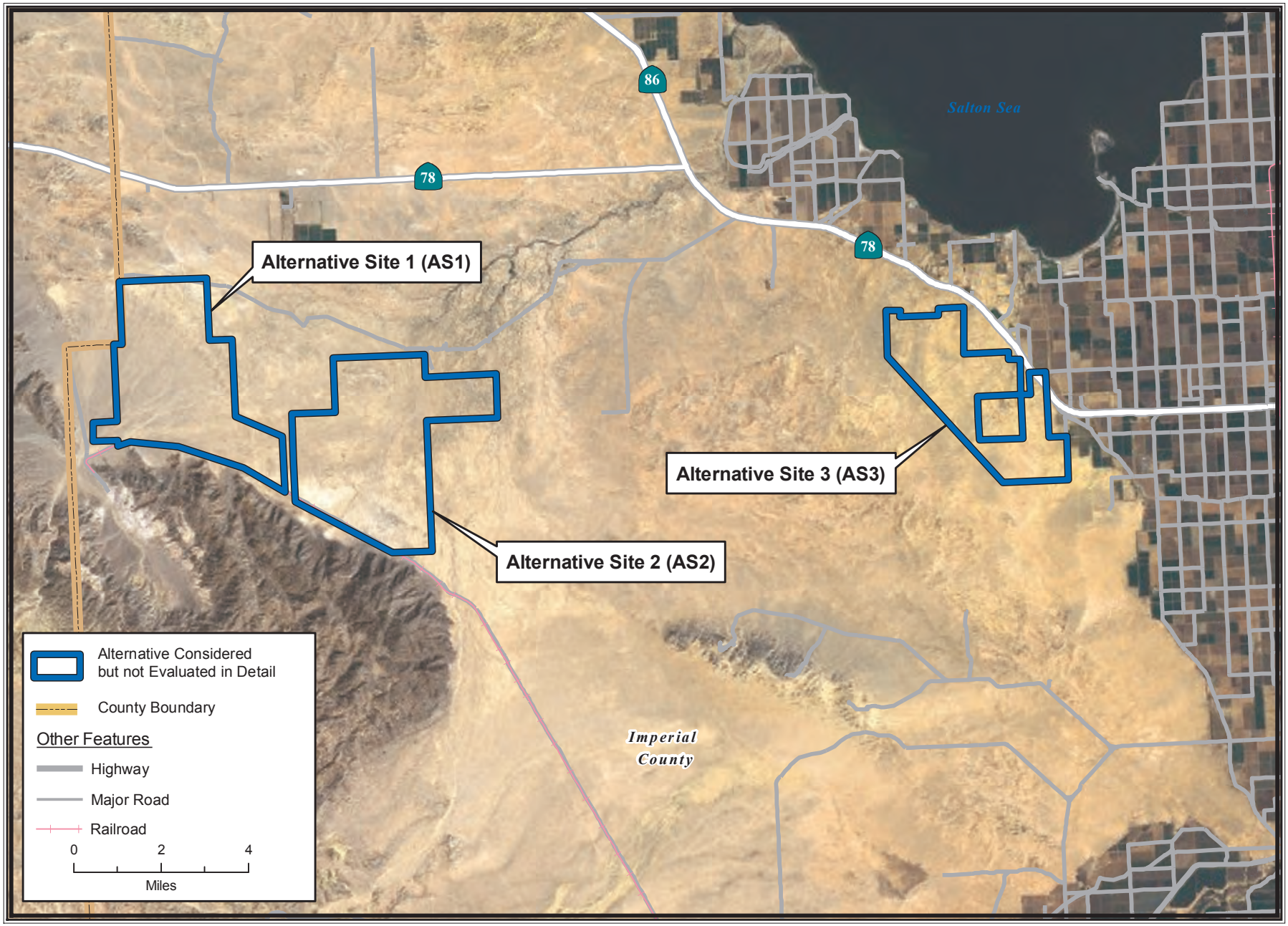


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, FEBRUARY 2010

SOURCE: California Energy Commission

ALTERNATIVES - FIGURE 6

SES Solar 2- Alternatives Considered but Not Evaluated in Further Detail



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, FEBRUARY 2010

SOURCE: SES 2008a

ALTERNATIVES FIGURE 7 – Solar Generation Technologies

Parabolic trough technology as used in Daggett, CA (Sunray Energy, Inc.)

Parabolic trough technology in a 64 MW field
(Nevada SolarOne in Boulder City, NV; photo from SolarOne website)

Solar Power Tower (from ISEGS PSA, 2008)

ALTERNATIVES FIGURE 8 – Linear Fresnel and Photovoltaic Technologies

Linear Fresnel technology
(Wikipedia.org, Fresnel_reflectors_ausra.jpg)

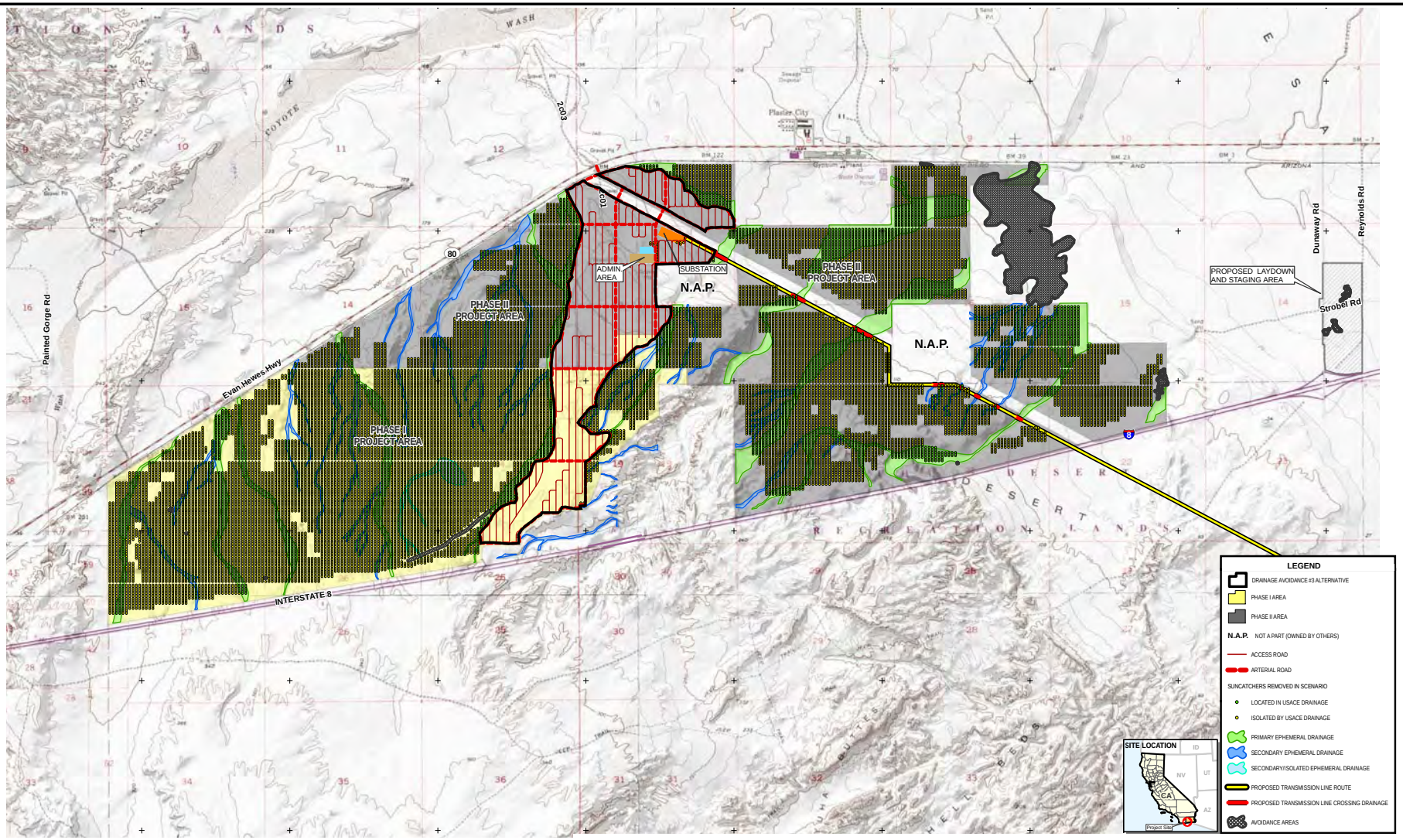
First Solar's thin film solar photovoltaic field
(Photo: Susan Lee)

Canon Solar Partners proposes to use the 35 kW Amonix system
(Canon 2008)

SunPower's PowerTracker Solar in Gwangju City Power Plant, South Korea - 1 MW
http://www.sunpowercorp.com/For-Power-Plants.aspx

ALTERNATIVES - FIGURE 9

SES Solar 2 - Drainage Avoidance #3 Alternative (Eliminated)



N

0 750 1500 3000

SCALE IN FEET

NOTES:

1. BASE MAP FROM U.S. GEOLOGICAL SURVEY 7.5 MINUTE QUADRANGLES. COUNTY MOSAICS OBTAINED FROM U.S. DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE.
2. MAP PROJECTION AND GRID COORDINATES ARE NAD 83 STATE PLANE CALIFORNIA, ZONE VI, U.S. SURVEY FEET.
3. DRAINAGE AREAS DELINIEATED BY USARMY CORPS OF ENGINEERS, SUPPLIED TO RMT BY URS.

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, FEBRUARY 2010

SOURCE: RMT, December 2009

B.3 - CUMULATIVE SCENARIO

Susan V. Lee

B.3.1 INTRODUCTION

Preparation of a cumulative impact analysis is required under both CEQA and NEPA. “Cumulative impact” is the impact on the environment which results from the incremental impact of the Proposed Project when considered with other past, present, and reasonably foreseeable future actions regardless of which agency (federal or non-federal) or person undertakes such other actions (40 CFR §1508.7).

Under CEQA Guidelines, “a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts” (14 Cal Code Regs §15130(a)(1)). 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)). Together, these projects comprise the cumulative scenario which forms the basis of the cumulative impact analysis.

CEQA also states that both the severity of impacts and the likelihood of their occurrence are to be reflected in the discussion, “but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion of cumulative impacts shall be guided by standards of practicality and reasonableness, and shall focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact” (14 Cal Code Regs §15130(b)).

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). Under NEPA, both context and intensity are considered. When considering intensity of an effect, we consider “[w]hether the action is related to other actions with individually minor but cumulatively significant impacts. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.” 40 CFR §1508.27(b)(7).

B.3.2 RENEWABLE RESOURCES IN CALIFORNIA

A number of renewable projects are currently under environmental review on BLM managed land, State land, and private land in California. Solar, wind, and geothermal development applications have requested use of BLM land, including approximately 1 million acres of the California Desert. Additional BLM land in Nevada and Arizona also has approximately 78 applications for solar and wind projects. State and private lands have also been targeted for renewable solar and wind projects. **Cumulative Figures 1 and 2** and **Cumulative Tables 1A and 1B** illustrate the numerous renewable projects on BLM, State and private land. Approximately 24 solar projects, 9 wind projects, and 2

geothermal projects in California are in various stages of the environmental review process or under construction (November, 2009). Additional remote renewable projects may be under consideration for which a Notice of Preparation and/or Notice of Intent have not been published at this time. Not all of the projects listed below will complete the environmental review, nor is it likely that all projects will be funded and constructed. However, the list is indicative of the large number of remote renewable projects being considered in California.

The numerous renewable projects now described in applications to the BLM and on private land are competing for utility Power Purchase Agreements, which will allow utilities to meet the state-required Renewable Portfolio Standard. While **Cumulative Impacts Figures 1 and 2** and **Tables 1A and 1B** show a very large number of applications to BLM, it is unlikely that all of these projects will be constructed for the following reasons:

- Not all developers will develop the detailed information necessary to meet BLM and Energy Commission standards. Most of the solar projects with pending applications are proposing generation technologies that have not been implemented at large scales. As a result, preparing complete and detailed plans of development (PODs) is difficult, and completing the required NEPA and CEQA documents is especially time-consuming and costly.
- As part of approval by the appropriate Lead Agency under CEQA and/or NEPA (generally the Energy Commission and/or BLM), all regulatory permits must be obtained by the applicant or the prescriptions required by the regulatory authorities incorporated into the Lead Agency's license, permit or right-of-way grant. The large size of these projects may result in permitting challenges related to endangered species, mitigation measures or requirements, and other issues.
- Also after project approval, construction financing must be obtained (if it has not been obtained earlier in the process). The availability of financing will be dependent on the status of competing projects, the laws and regulations related to renewable project investment, and the time required for obtaining permits.

While not all the renewable projects currently proposed will be constructed, a number of existing policies and incentives encourage renewable energy development. These incentives lead to a greater number of renewable energy proposals. Example of incentives for developers to propose renewable energy projects on private and public lands in California, Nevada and Arizona, include the following:

- U.S. Treasury Department's Payments for Specified Energy Property in Lieu of Tax Credits under §1603 of the American Recovery and Reinvestment Act of 2009 (Public Law 111-5) - Offers a grant (in lieu of investment tax credit) to receive funding for 30% of their total capital cost at such time as a project achieves commercial operation (currently applies to projects that begin construction by December 31, 2010 and begin commercial operation before January 1, 2017).
- U.S. Department of Energy (DOE) Loan Guarantee Program pursuant to §1703 of Title XVII of the Energy Policy Act of 2005 - Offers a loan guarantee that is also a

low interest loan to finance up to 80% of the capital cost at an interest rate much lower than conventional financing. The lower interest rate can reduce the cost of financing and the gross project cost on the order of several hundred million dollars over the life of the project, depending on the capital cost of the project.

B.3.3 DEFINITION OF A CUMULATIVE PROJECT SCENARIO

The purpose of a cumulative effects analysis is to ensure that the decision makers consider the full range of consequences of the action. Most of the projects listed in the cumulative projects tables (see **Cumulative Tables 1, 2, and 3** at the end of this section) have, are, or will be required to undergo their own independent environmental review under either CEQA or NEPA or both.

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 SA/EIS uses the “list approach” to provide a tangible understanding and context for analyzing the potential cumulative effects of a Project.

In order to provide a basis for cumulative analysis for each discipline, this section provides information on other projects in both maps and tables. Projects are defined within a geographic area that has been identified by the Energy Commission and the BLM as covering an area large enough to provide a reasonable basis for evaluating cumulative impacts for all disciplines, as shown in three maps and accompanying tables. **Cumulative Figures 1, 2, and 3** are on the following pages, and **Cumulative Tables 1, 2, and 3** are presented at the end of this section.

Cumulative Impacts - Figure 3, Plaster City Existing and Future/Foreseeable Projects and Tables 2 and 3 list foreseeable future projects in the immediate Plaster City area. Table 2 presents existing projects and Table 3 presents Future Foreseeable Projects in the Plaster City Area. Both tables indicate project name and project type, its location and its status.

B.3.4 APPROACH TO CUMULATIVE IMPACT ANALYSIS

This Staff Assessment/Draft EIS evaluates cumulative impacts within the analysis of each resource area, following these steps:

1. Define the geographic scope of cumulative impact analysis for each discipline, based on the potential area within which impacts of the SES Solar Two, LLC project could combine with those of other projects.

2. Evaluate the effects of the SES Solar Two, LLC Project in combination with past and present (existing) projects in the project area.
3. Evaluate the effects of the SES Solar Two, LLC Project with foreseeable future projects that occur within the area of geographic effect defined for each discipline.

Each of these steps is described below.

Geographic Scope of Cumulative Analysis

The area of cumulative effect varies by resource. For example, air quality impacts tend to disperse over a large area, while traffic impacts are typically more localized. For this reason, the geographic scope for the analysis of cumulative impacts must be identified for each resource area.

The analysis of cumulative effects considers a number of variables including geographic (spatial) limits, time (temporal) limits, and the characteristics of the resource being evaluated. The geographic scope of each analysis is based on the topography surrounding the SES Solar Two, LLC Project and the natural boundaries of the resource affected, rather than jurisdictional boundaries. The geographic scope of cumulative effects will often extend beyond the scope of the direct effects, but not beyond the scope of the direct and indirect effects of the proposed action and alternatives.

In addition, each project in a region will have its own implementation schedule, which may or may not coincide or overlap with the SES Solar Two, LLC Project's schedule. This is a consideration for short-term impacts from the SES Solar Two, LLC Project. However, to be conservative, the cumulative analysis assumes that all projects in the cumulative scenario are built and operating during the operating lifetime of the SES Solar Two, LLC Project.

Project Effects in Combination with Foreseeable Future Projects

Each discipline evaluates the impacts of the proposed project on top of the current baseline; the past, present (existing) and future projects near the SES Solar Two, LLC site as illustrated in **Cumulative Impacts - Figure 3, Plaster City Area Existing and Future/Foreseeable Projects** and listed in **Table 2 (Existing Projects in the Plaster City Region)**. The intensity, or severity, of the cumulative effects should consider the magnitude, geographic extent, duration and frequency of the effects (CEQ, 1997). The magnitude of the effect reflects the relative size or amount of the effect; the geographic extent considers how widespread the effect may be; and the duration and frequency refer to whether the effect is a one-time event, intermittent, or chronic (CEQ, 1997).

Reasonably foreseeable projects that could contribute to the cumulative effects scenario depend on the extent of resource effects, but could include projects in the immediate Plaster City area as well as other large renewable projects in Imperial County, or the greater California Desert. These projects are illustrated in **Cumulative Impacts Figures 1 and 2**.

SES Solar Two, LLC area projects are illustrated in **Cumulative Impacts Figure 3, Plaster City Area Existing and Future Foreseeable Projects.** As shown in the map and table, there are a number of projects in the immediate area around Plaster City whose impacts could combine with those of the proposed SES Solar Two, LLC Project. As shown on **Cumulative Impacts Figure 2** and in **Table 1**, solar and wind development applications for use of BLM land have been submitted for approximately 107,000 acres of the land in the Imperial County region of the California Desert Conservation Area.

Cumulative Impacts Table 2 lists existing projects in the Solar Two project area, and **Cumulative Impacts Table 3** lists future foreseeable projects in the project area.

Cumulative Impacts Table 1A
Renewable Energy Projects in the California Desert District

BLM Field Office	Number of Projects & Acres	Total MW
Solar Energy		
Barstow Field Office	• 20 projects • 150,217 acres	• 13,176 MW
El Centro Field Office	• 9 projects • 62,989 acres	• 4,820 MW
Needles Field Office	• 19 projects • 284,680 acres	• 15,700 MW
Palm Springs Field Office	• 19 projects • 127,561 acres	• 11,400 MW
Ridgecrest Field Office	• 5 projects • 31,743 acres	• 2,935 MW
TOTAL – CA Desert District	• **72 projects** • **649,440 acres**	• **48,531 MW**
Wind Energy		
Barstow Field Office	• 25 projects • 171,560 acres	• n/a
El Centro Field Office	• 8 projects • 49,506 acres	• n/a
Needles Field Office	• 8 projects • 111,931 acres	• n/a
Palm Springs Field Office	• 4 projects • 5,852 acres	• n/a
Ridgecrest Field Office	• 16 projects • 94,872 acres	• n/a
TOTAL – CA Desert District	• **61 projects** • **433,721 acres**	• n/a

Source: Renewable Energy Projects in the El Centro Field Office of the California Desert Conservation Area identifies solar and wind renewable projects as listed on the BLM California Desert District Alternative Energy Website (BLM 2009)

Cumulative Impacts Table 1B
Renewable Energy Projects on State and Private Lands

Renewable Resource	Project Name	Location	Status
Solar	Abengoa Mojave Solar Project (250 MW solar thermal)	San Bernardino County, Harper Lake	Under environmental review
	Rice Solar Energy Project (150 MW solar thermal)	Riverside County, north of Blythe	Under environmental review
	3 MW solar PV energy generating facility	San Bernardino County, Newberry Springs	MND published for public review
	Blythe Airport Solar 1 Project (100 MW solar PV)	Blythe, California	MND published for public review
	First Solar's Blythe (21 MW solar PV)	Blythe, California	Under construction
	California Valley Solar Ranch (SunPower) (250 MW solar PV)	Carrizo Valley, San Luis Obispo County	Under environmental review
	LADWP and OptiSolar Power Plant (68 MW solar PV)	Imperial County, SR 111	Under environmental review
	Topaz Solar Farm (First Solar) (550 MW solar PV)	Carrizo Valley, San Luis Obispo County	Under environmental review
	AV Solar Ranch One (230 MW solar PV)	Antelope Valley, Los Angeles County	Under environmental review
	Bethel Solar Hybrid Power Plant (49.4 MW hybrid solar thermal and biomass)	Seeley, Imperial County	Under environmental review
	Mt. Signal Solar Power Station (49.4 MW hybrid solar thermal and biomass)	8 miles southwest of El Centro, Imperial County	Under environmental review
Wind	Alta-Oak Creek Mojave Project (up to 800 MW)	Kern County, west of Mojave	Under environmental review
	PdV Wind Energy Project (up to 300 MW)	Kern County, Tehachapi Mountains	Approved
	Solano Wind Project Phase 3 (up to 128 MW)	Montezuma Hills, Solano County	Under environmental review
	Hatchet Ridge Wind Project	Shasta County, Burney	Under construction
	Lompoc Wind Energy Project	Lompoc, Santa Barbara County	Approved
	Pacific Wind (Iberdrola)	McCain Valley, San Diego County	Under environmental review
	TelStar Energies, LLC (300 MW)	Ocotillo Wells, Imperial County	Under environmental review
Geothermal	Buckeye Development Project	Geyserville, Sonoma	Under environmental review
	Orni 18, LLC Geothermal Power Plant (49.9 MW)	Brawley, Imperial County	

Source: CEQAnet [http://www.ceqanet.ca.gov/ProjectList.asp], November 2009.

Cumulative Impacts Table 2
Existing Projects in the Plaster City Area

ID	Project Name/Agency ID	Location	Ownership	Status	Project Description
1	U.S. Naval Air Facility El Centro	West Mesa	U.S. Navy	Existing	El Centro Naval Air Facility U.S. Naval Reservation Target 103 and Parachute Drop Zone. Desert range is used for air-to-ground bombing, rocket firing, strafing, dummy drops and mobile land target training.
2	Recreation Activities	West Mesa FTHL Management Area	BLM	Ongoing	The area is primarily used for the conservation of Flat Tailed Horned Lizard. OHV activity is limited to designated routes of travel only within this area. There are occasional groups that visit this area for trail rides.
3	Recreation Activities	Yuha Basin ACEC	BLM	Ongoing	The area is primarily used for the conservation of Flat Tailed Horned Lizard, and archaeological resources. OHV activity is limited to designated routes of travel only within this area. The Juan Bautista De Anza National Historic Trail runs through this area. This region is also rich with paleontological and geological resources. Visitors come to this area to find fossils and explore the area's geology and enjoy the desert landscape. Some schools and universities have visited this region for educational field trips and research.
4	U.S. Gypsum Mining	Plaster City	Gypsum Mining	Existing; Quarry is undergoing expansion FEIR released Jan 2008.	Existing gypsum plant; proposal to expand active gypsum quarry undergoing environmental review. Gypsum quarry is located 26 miles northwest of the plant located at Plaster City.
5	California State Prison, Centinela	2302 Brown Road, Imperial, CA	State of California	Existing	Existing prison opened in 1993 which covers 2,000 acres.
6	Recreation Activities	Superstition Mountain and Plaster City Open Area	BLM	Ongoing	Cross-country OHV use is permitted within the boundaries of this area. Approximately 20 to 30 Permitted and Organized events occur on the Plaster City Open Area and Superstition Mountains Open Area. Many of these events are competitive OHV races involving as many as 100 riders and several hundred spectators. The area is a popular OHV riding area with high visitation during the cool season and on holiday weekends.

Source: Existing Projects in the Plaster City Area identifies already existing projects within the Plaster City area. These projects were identified through a variety of sources including the Imperial County and City of El Centro websites, BLM website and individual project websites

Cumulative Impacts Table 3
Future Foreseeable Projects in the Plaster City Area

ID	Project Name/Agency ID	Location	Ownership	Status	Project Description
A	Mount Signal Solar Power Station	Imperial Valley – Need further detail.	MMR Power Solutions, LLC	PPA with SDG&E. SDG&E filed request for approval of PPA with CPUC Energy Division and approval was granted 9/18/08.	New 49.4 MW solar thermal hybrid project due online in December 2009.
B	Green Path	From the Imperial Valley Substation to the Dixieland Substation	IID	Draft EIS in progress, Scoping Report available. Preparing Draft EIS: Draft Alternatives Working Paper is available. Construction expected to begin 2012.	Green Path 230 kV Project (Board Approved). The upgrade would serve solar, wind and biomass generators near the Imperial Valley Substation, and act as a back-up to the current 'S' line and creating greater system reliability to the entire IID system. Construct two new 230 kV electrical substations on 10 acres with a 230 kV transmission line connection.
C	Wind Zero – Training Facility	Ocotillo	Wind Zero Group, Inc.	Wind Zero Group, Inc. submitted plans to Imperial County May 2008.	Wind Zero proposes to build a 400-acre training facility for law enforcement, government, college and public near Ocotillo (south of Interstate 8 and north of SR 98) on land that it purchased in 2007. Wind Zero proposes to use the additional 600-acre site to build a 6.1-mile road coarse and racetrack country club.
D	Atlas Storage Facility	Ocotillo townsite/ Imperial Highway	Atlas Storage Centers	Atlas Storage Centers	RV storage facility related to new water well on 5.3 acre parcel currently vacant land.
E	Mixed-Use Development	South of Ross Avenue/east of Austin	Miller Burson Development Design and Engineering	Responses to Draft EIR under preparation.	570 single-family lots and a school site on 160 acres. COZ No. 05-02, EIR No. 05-02.
F	Mixed-Use Development	West of La Brucherie/east of Austin and north of West Evan Hewes Highway	Las Aldeas Specific Plan Westshore (Lerno) Development	City of El Centro staff working on staff report and conditions of approval.	2,641 residential lots, general commercial (27.46 acres), heavy commercial (10.17 acres), 2 school sites for a total of over 680 acres.

ID	Project Name/Agency ID	Location	Ownership	Status	Project Description
G	Mixed-Use Development	Southeast corner of 8th Street (Clark Road) about 630 feet south of Horne Road	Michael H Galey/The Kennedy Group	MND proposal being reviewed by applicant	65 single-family lots on over 36 acres.
N/A	Update General Plan	El Centro city-wide	City of El Centro	Tentative schedule for PC meeting of January 6, 2009	Update Circulation Element of General Plan; Update Housing Element of General Plan;
N/A	Update Park Master Plant	El Centro city-wide	City of El Centro	Scheduled for CC meeting December 17, 2008	Preparation of Parks & Recreation Facilities Master Plan
H	Mixed-Use Development	South of Interstate 8 between La Brucherie and Lotus Canal and Drain	Lotus Ranch (Gary McPhetrige)	On hold per applicant request (June 2008)	658 single family lots, detention basin on over 213 acres.
I	Mixed-Use Development	East of Austin Road and north of W. Ross Rd.	Desert Village #6	Approved – granted extension of 2 years for filing final map of Subdivision Map (August 2008)	110 single-family units, 125 multiple-family units, 5.5 acres of commercial development
J	Mixed-Use Development	East of Austin Road and south of Orange Avenue	Courtyard Villas	EIR in process	21.5 acres, 54 single-family units
K	Mixed-Use Development	1002 East Evan Hewes Highway	Colace Brothers Industrial Park	Approved by City of El Centro March 2008	15 parcel subdivision on APN 054-280-024 and 054-280-048
L	Sunrise Powerlink Project	From Imperial County to San Diego County	SDG&E	FEIR/EIS released, awaiting Commission and BLM decision	Approximately 120-mile long 500 kV transmission line from Imperial Valley Substation to Sycamore Canyon Substation, BLM preferred route would bisect the proposed SES Solar Two LLC site
M	Ocotillo Express Wind Facility	Immediately east of the proposed site	Pattern Energy Group	Under environmental review	Construct an approximately 550 MW wind facility immediately east of the proposed project on approximately 15,000 acres.
N	Pedestrian Fence 225 and Pedestrian Fence 70	Along the U.S./Mexico Border	U.S. Department of Homeland Security	Under construction	Construct a tactical infrastructure project that plans to construct approximately 225 miles of primary pedestrian fencing along the southwest border of the United States.

ID	Project Name/Agency ID	Location	Ownership	Status	Project Description
O	Mixed Use–Recreation	Plaster City Open Area; Yuha; Superstition Mountain Open Area	BLM	The recreational use of the open areas, especially OHV use, is expected to continue and potentially grown in the foreseeable future.	Cross-country OHV use is permitted within the boundaries of Plaster City Open Area and Superstition Mountain Open Area, Limited Use area is allowed in Yuha which offers washes and trails. Organized and permitted OHV events occur at both Plaster City Open Area and Superstition Mountain Open Area.
P	West-wide Energy Corridor	Throughout the Imperial Valley on BLM land	DOE	Final Programmatic EIS was published Nov. 28; awaiting Record of Decision	Section 368 of the Energy Policy Act of 2005 (the Act), Public Law 109-58 (H.R. 6), enacted August 8, 2005, directs the Secretaries of Agriculture, Commerce, Defense, Energy, and the Interior (the Agencies) to designate under their respective authorities corridors on federal land in 11 Western States (Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming) for oil, gas, and hydrogen pipelines and electricity transmission and distribution facilities (energy corridors).
Q	Seeley Waste Water Treatment Facility Upgrade	New River Boulevard, Seeley, California	Seeley County Water District	Engineering plans required, completion of project expected March 2010.	SES would finance an upgrade to the existing facility to allow it to meet the Title 22 water quality standards.

Source: Future Foreseeable Projects in the Plaster City Area identifies future foreseeable projects within the Plaster City area. These projects were identified through a variety of sources including the Imperial County and City of El Centro websites, BLM website and personal communication, and individual project websites

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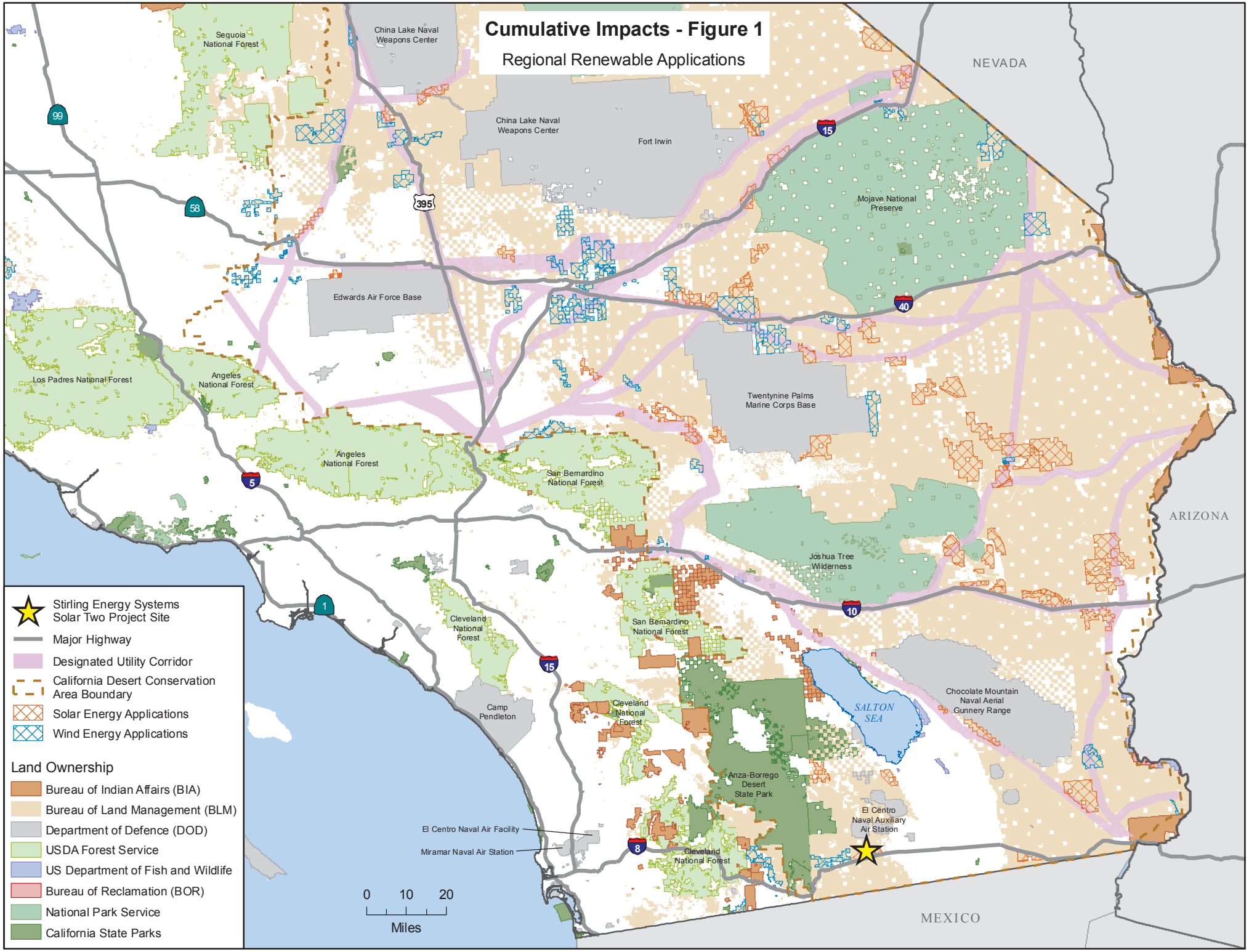
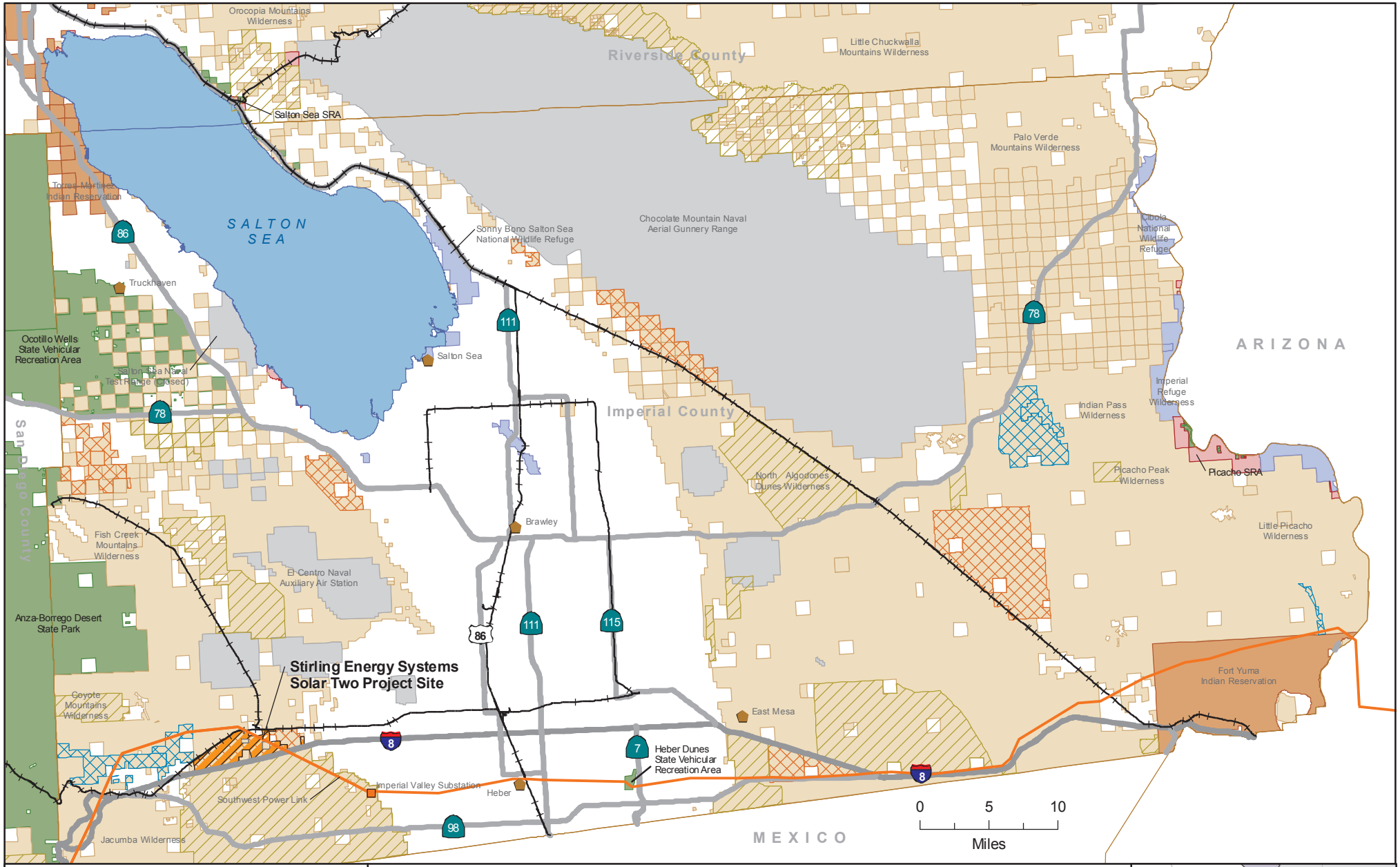

Cumulative Impacts - Figure 1
Regional Renewable Applications
NEVADA
ARIZONA
MEXICO
Sequoia National Forest
China Lake Naval Weapons Center
China Lake Naval Weapons Center
Fort Irwin
Mojave National Preserve
Edwards Air Force Base
Los Padres National Forest
Angeles National Forest
Angeles National Forest
San Bernardino National Forest
Twentynine Palms Marine Corps Base
Joshua Tree Wilderness
San Bernardino National Forest
Cleveland National Forest
Camp Pendleton
Cleveland National Forest
Cleveland National Forest
SALTON SEA
Chocolate Mountain Naval Aerial Gunnery Range
Anza-Borrego Desert State Park
El Centro Naval Auxiliary Air Station
El Centro Naval Air Facility
Miramar Naval Air Station
99
58
395
15
40
5
1
10
15
8
Stirling Energy Systems Solar Two Project Site
Major Highway
Designated Utility Corridor
California Desert Conservation Area Boundary
Solar Energy Applications
Wind Energy Applications
Land Ownership
Bureau of Indian Affairs (BIA)
Bureau of Land Management (BLM)
Department of Defence (DOD)
USDA Forest Service
US Department of Fish and Wildlife
Bureau of Reclamation (BOR)
National Park Service
California State Parks
0 10 20
Miles



Cumulative Impacts - Figure 2

Imperial County Renewable Applications on BLM Land

Stirling Energy Systems Solar Two Project Site

Area of Critical Environmental Concern

Energy Application

Solar Energy Applications

Wind Energy Applications

Land Ownership

Bureau of Indian Affairs (BIA)

Bureau of Land Management (BLM)

Department of Defence (DOD)

California State Parks

US Department of Fish and Wildlife

Other Features

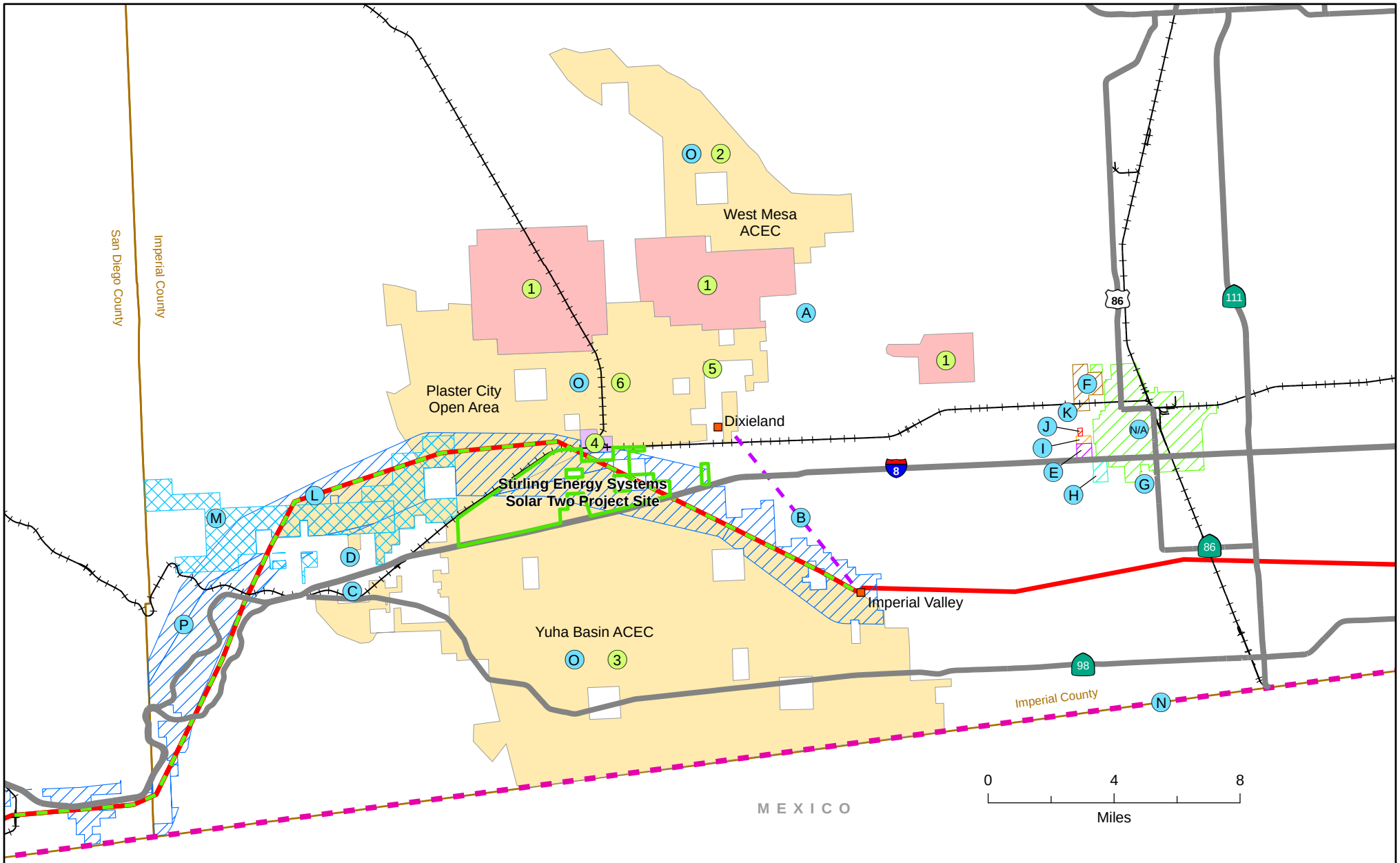
Imperial Valley Substation

Geothermal Project Site

Southwest Power Link

Railroad

Major Highway



Cumulative Impacts - Figure 3

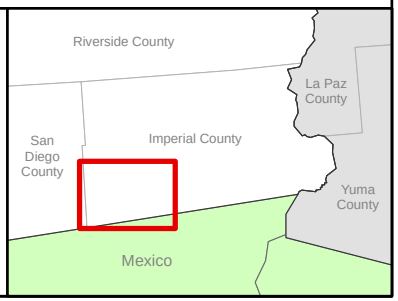
Plaster City - Existing and Future/ Foreseeable Projects

Existing Projects

- Existing Project
- 1
- 4
- 6, 7, 8, and O

Future/Foreseeable Projects

- Future/Foreseeable Project
- B
- L
- N
- J
- M
- I
- F
- H
- P
- E
- N/A

Other Features

- Substation
- Southwest Power Link
- Major Highway
- Railroad
- Stirling Energy Systems Solar Two Project Site