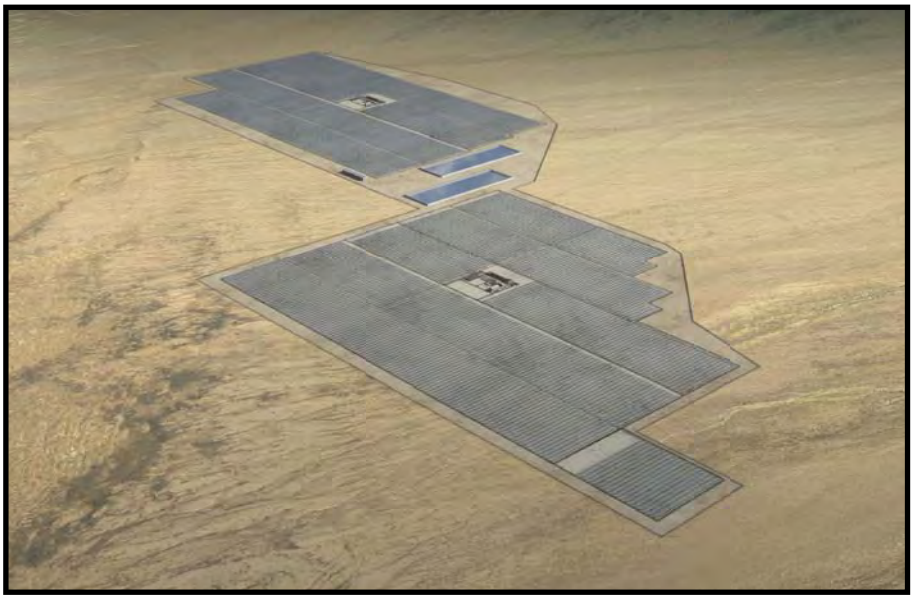
Staff Assessment and
Environmental Impact Statement

GENESIS SOLAR ENERGY PROJECT

Application For Certification (09-AFC-8)
Riverside County



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

STAFF REPORT

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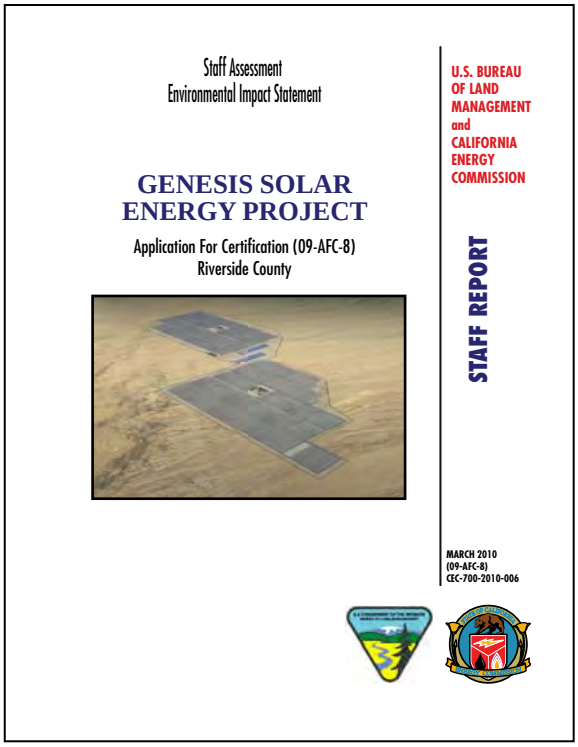

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GENESIS SOLAR ENERGY PROJECT (09-AFC-8)
STAFF ASSESSMENT/DRAFT ENVIROMENTAL IMPACT STATEMENT

EXECUTIVE SUMMARY

Testimony of Mike Monasmith

INTRODUCTION

This Staff Assessment/Draft Environmental Impact Statement (SA/DEIS) is a joint document being published by the U.S. Bureau of Land Management (BLM) and the California Energy Commission (CEC). It is in the interest of the BLM and the Energy Commission to share in the preparation of a joint environmental analysis of the proposed project to avoid duplication of staff efforts, to share staff expertise and information, to promote intergovernmental coordination at the local, state, and federal levels, and to facilitate public review by providing a joint document and a more efficient environmental review process. Additionally, both the National Environmental Policy Act of 1969 (NEPA) and the California Environmental Quality Act (CEQA) have provisions to promote the efficient preparation of joint documents in order to save resources and benefit the public.

This SA/DEIS contains U.S. Bureau of Land Management and Energy Commission staff (hereafter jointly referred to as staff) independent evaluation of the Genesis Solar LLC (applicant) Genesis Solar Energy Project (GSEP) application, which was filed with the BLM and CEC. The application filed with BLM is the BLM Application for a Right of Way Grant on BLM-administered land (CACA 048880), and the application filed with the Energy Commission is the Application for Certification (09-AFC-8). The SA/DEIS examines engineering, environmental, public health, and safety aspects of the GSEP, based on the information provided by the applicant and other sources available at the time the SA/DEIS was prepared. The SA/DEIS will also include for BLM a Draft Land Use Plan Amendment (Draft PA) to the BLM's California Desert Conservation Area Plan (1980) (as Amended).

The applicant has also applied for the American Recovery and Reinvestment Act (ARRA) Renewable Energy Grant Program. Two goals of the ARRA Renewable Energy Grant Program are to enhance America's energy independence and create near-term employment opportunities for Americans. To be eligible for these ARRA funds, the applicant must begin construction on the GSEP by the end of 2010.

This SA/DEIS serves as staffs' analysis of the engineering, environmental, public health and safety aspects of the proposed project, based on the information provided by the applicant and other sources available at the time the SA/DEIS was prepared. The SA/DEIS contains all analyses normally contained in an Environmental Impact Report (EIR) as required by the California Environmental Quality Act (CEQA), as well as all analyses required as part of an EIS prepared under the National Environmental Policy Act (NEPA). The SA/DEIS will be available for a 90-day public comment period beginning on April 9, 2010. The Notice of Availability (NOA) (published by the U.S. Environmental Protection Agency in the *Federal Register*) initiates the 90-day public review and comment period.

When considering a power plant project greater than 50 Megawatts (MWs) for licensing, the Energy Commission is the lead state agency under CEQA, and its process is

functionally equivalent to the preparation of an EIR. Similarly, BLM is the lead Federal agency for the NEPA review of the proposed Right-of-Way and possible Land Use Plan Amendment. The Energy Commission and the BLM are engaging in concurrent review processes. The following explains in more detail the steps each agency will take to complete review.

In support of its certification process, the Energy Commission staff has the responsibility to complete an independent assessment of the project's engineering design and its potential effects on the environment, on the public's health and safety, and whether the project conforms with all applicable laws, ordinances, regulations and standards (LORS). The staff also recommends measures to mitigate potential significant adverse environmental effects and conditions of certification for construction, operation, maintenance and eventual decommissioning of the project.

This SA/DEIS is not the decision document for these proceedings nor does it contain findings of the Energy Commission related to environmental impacts or the project's compliance with local/state/federal legal requirements. The SA/DEIS will serve as staff's testimony in evidentiary hearings to be held by the Committee of two Commissioners overseeing this case. The Committee will consider the recommendations presented by staff, the applicant, all parties, government agencies, and the public prior to proposing its decision. The entire Energy Commission will make a final decision, including findings after the Committee's publication of its proposed decision. The Commission's final decisions on power plant AFCs greater than 50 MWs are subject to judicial review by the Supreme Court of California (Pub. Res. § 25531.)

In support of the processing of the Right-of-Way (ROW) Application and land use plan amendment processes, the BLM has the responsibility to evaluate the environmental impacts of the proposed action, the No Action alternative, and other alternatives that may meet the purpose and need for the proposed project.

The BLM has determined that the proposed site for the Genesis project is not identified in the California Desert Conservation Area (CDCA) Plan as associated with power generation or transmission. The requested ROW cannot be granted unless such a grant would be consistent with the terms of the CDCA Plan. Therefore, BLM must amend the Plan to allow power generation and transmission at the proposed site as a prerequisite to granting the ROW. As part of the DEIS, BLM identify its preferred alternative and will also present a potential Draft PA to the CDCA Plan to allow for the project if a ROW is granted.

Following the 90-day public comment period, BLM and CEC staff will review and develop responses to comments provided by the public and other agencies and plan to publish the responses in August, 2010. Responses to the comments and other relevant information identified during the comment period will be incorporated into the Supplemental Staff Assessment/Final Environmental Impact Statement (SSA/FEIS), which will also identify for BLM a Proposed Land Use Plan Amendment (Proposed PA). The NOA (published by the EPA in the *Federal Register*) will initiate a 30-day protest period on the Proposed PA to the Director of the BLM. Protests regarding the Proposed PA must be sent in writing to the Director of the BLM and comply with the protest procedures described in 43 CFR § 1610.5-2.

Following resolution of any protests regarding proposed CDCA Plan amendments, BLM may then publish an Approved Plan Amendment and a Record of Decision (ROD) on the Project Application. The decision regarding the ROW grant is appealable to the Interior Board of Land Appeals upon issuance of the ROD.

PROPOSED PROJECT LOCATION AND DESCRIPTION

The GSEP is located approximately 25 miles west of the city of Blythe, California, on BLM-administered lands. The project area is south of the Palen/McCoy Wilderness Area and north of Ford Dry Lake and Interstate 10, and can be viewed in **Project Description Figures 1** and **2**. The proposed GSEP is entirely on Federal land. A summary legal description of the BLM ROW application is provided in the following Table.

Section	Aliquot	Estimated Acres
Township 6S, Range 19E, San Bernardino Base & Meridian		
4	S ½ except wilderness	260
5	All except wilderness	550
6	SE ¼	160
7	N ½ NE ¼	80
8	NE ¼, N ½ NW ¼	240
9	N ½	320
10	All except wilderness	580
11	SW ¼	160
13	NW ¼ except wilderness; SW ¼	280
14	N ¾, NW ¼, N ¾, NE ¼	240
15	N ½ NW ¼ , N ½ NE ¼	160
24	W ½ N ½	160
	Subtotal, T 6 S, R 19 E:	3,190
Township 6S, Range 18E, San Bernardino Base & Meridian		
1	S ½ except wilderness	290
2	S ½ except wilderness	260
3	S ½	320
4	All except wilderness	580
	Subtotal, T 6S, R18 E:	1,450
	Total, Modified ROW, 1/4/08	**4,640**

Source: BLM, Plan of Development, September 2009

The applicant is seeking a Right-of-Way grant with BLM for approximately 4,640 acres of lands. (The ROW application for the GSEP was originally 19,000 acres when filed in 2007). Construction and operation of the project would disturb a total of about 1,800 acres. As such, any difference between the total acreage listed in the Right-of-Way application (4,640) and the total acreage required for project construction and operation (approx. 1,800) would not be part of the ROW grant, if BLM decides to approve the project.

The Project area is located in east central Riverside County, where land use is characterized predominantly by open space and conservation and wilderness areas. The western portion of the county accounts for most of the developed area of the county, including urban areas and agricultural areas. The southeastern corner of the

county to the east of the Project also contains limited agricultural areas and rural development (Riverside County, 2003). The following Riverside County Assessor's Parcel Number's apply to the parcels within the overall ROW and linear corridor boundary: 810290005-810290008, 810410013, 810410019, 810410014, 810410026, 810410002, 810410021, 810410015, 810410022, 810410023, 810410027-810410029, 810420012, 818040010, 818070001-818101003, 818111008, 818112004,879020025.

The area designated within the Palo Verde Valley Area Plan occurs to the east of the Project and encompasses the developed and agricultural area in eastern Riverside County. The portion of the Palo Verde Valley Area Plan in the vicinity of the Project consists mainly of sparsely populated desert and mountain areas. The more populated and agricultural areas occur farther east of the GSEP in the vicinity of Blythe.

The Project is also located within the BLM California Desert Conservation Area Plan (CDCA Plan) (BLM, 1980), and is shown in **Project Description Figure 3**. The CDCA Plan establishes a number of conservation areas under the Wilderness Review Program. The Project is located adjacent to the southern boundary of the Palen/McCoy Wilderness Area. The Chuckwalla Mountains and Little Chuckwalla Mountains Wilderness Areas are also located farther south-southwest of the Project.

The Genesis project will utilize solar parabolic trough technology to generate electricity. With this technology, arrays of parabolic mirrors collect heat energy from the sun and refocus the radiation on a receiver tube located at the focal point of the parabola. A heat transfer fluid (HTF) is heated to high temperature (750°F) as it circulates through the receiver tubes. The heated HTF is then piped through a series of heat exchangers where it releases its stored heat to generate high pressure steam. The steam is then fed to a traditional steam turbine generator where electricity is produced.

MAJOR COMPONENTS OF THE PROPOSED PROJECT

The following items are some of the major components of GSEP. For a more exhaustive list, please see Section B.1.2., in the **Project Description** section.

Project Construction

Project construction is expected to occur over a total of 39 months. Project construction will require an average of 646 employees over the entire 39-month construction period, with labor requirements peaking at approximately 1,085 workers in Month 23 of construction. The construction workforce will consist of laborers, craftsmen, supervisory personnel, support personnel, and management personnel.

Temporary construction parking areas will be provided within the power plant site adjacent to the laydown area. The plant laydown area will be utilized throughout the build out of the two solar units. If approved, project construction would begin in the fourth quarter of 2010, with commercial operation commencing in the second quarter of 2013.

Operation and Maintenance

While electrical power is to be generated only during daylight hours, GSEP will be staffed 24 hours a day, seven days per week. A total estimated workforce of 40-50 full time employees will be needed once the GSEP is fully operational.

Transmission System

The GSEP generation tie-line would use the existing pole structures of the BEPTL to interconnect with Southern California Edison's proposed Colorado River Substation, to be located south and west of the city of Blythe, California.

Transmission Line Route

Project proposed new transmission line, along with a new access road and new natural gas pipeline will be co-located in one linear corridor to serve the main GSEP facility. This corridor would exit the facility to the south and would be approximately 6.5 miles long. The generation tie-line would cross Interstate 10 (I-10), and tie into the Blythe Energy Project Transmission Line (BEPTL), which is currently under construction.

Fuel Supply and Use

The auxiliary boiler will be fueled by natural gas supplied from a new six-mile, eight-inch pipeline connected to an existing Southern California Gas pipeline located north of I-10. The maximum estimated natural gas usage is expected to be 60 million standard cubic feet per year, for a maximum of 60,000 million British thermal units per year.

Water Use

The GSEP proposes to use a wet cooling tower for power plant cooling. Water for cooling tower makeup, process water (steam) makeup, and other industrial purposes uses such as mirror washing would be supplied from onsite groundwater wells, and stored in several on-site tanks. Storage tanks would contain raw water (500,000 gallons), treated water (1,250,000 gallons) and wastewater (250,000 gallons). Project cooling water blowdown would be piped to lined, onsite evaporation ponds (two 30-acre ponds that will be covered by nets to discourage migratory and local bird usage). After used project water has gone through the evaporation process, the solids that settle at the bottom of the evaporation pond will be periodically tested by the applicant, and removed to a licensed, non-hazardous waste disposal facility.

Water Requirements

The GSEP proposes to utilize approximately 1,644 acre-feet of ground water per year (AFY) for its operation. Staff is recommending a Water Conservation Plan, which has several options to reduce water use.

Water Source and Quality

The GSEP water needs will be met by use of groundwater pumped from one of two wells on the plant site. Water for domestic uses by project employees will also be provided by onsite groundwater treated to potable water standards. Groundwater modeling testing data indicates that the onsite groundwater has varying levels of totally dissolved solids (TSD) that range from 3,000 to 5,000 mg/l.

Solar Mirror Washing Water

Water from the primary desalination process (reverse osmosis (RO) water), will be deionized and used to clean the solar collectors and to facilitate dust and contaminant removal. The collectors would be cleaned once or twice per week, determined by the reflectivity monitoring program. This mirror washing operation would be done at night and involves a water truck spraying treated water on the mirrors in a drive-by fashion. The applicant expects that that the mirrors will be washed weekly in winter and twice weekly from mid-spring through mid-fall. Because the mirrors are angled down for washing, water does not accumulate on the mirrors; instead, it would fall from the mirrors to the ground and, due to the small volume (two acre-feet/year), is expected to soak in with no appreciable runoff. Any remaining rinse water from the washing operation would be expected to evaporate on the mirror surface.

PROPOSED PROJECT OBJECTIVES

The specific objectives of GSEP are:

- To develop a utility-scale solar energy project utilizing parabolic trough technology;
- To construct and operate an environmentally friendly, economically sound, and operationally reliable solar power generation facility that will contribute to the State of California's renewable energy goals;
- To locate the project in an area with high solar insolation (i.e., high intensity of solar energy);
- To interconnect directly to the CAISO Grid through BEPTL and the SCE electrical transmission system; and
- To fulfill Governor Schwarzenegger's and Secretary Salazar's Memorandum of Understanding to expedite renewable energy development in California.

SUPPORT FOR PROPOSED PROJECT

NEPA guidance published by the Council on Environmental Quality (CEQ) states that an environmental impact statement 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.

BLM PURPOSE AND NEED

The BLM's purpose and need for the GSEP is to respond to Genesis Solar, LLC's application under Title V of Federal Land Policy and Management Act, 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 Genesis Solar, LLC for the proposed GSEP. 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 Energy Policy Act 2005, 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."

The Federal government and the State of California have established the need for the nation and State to increase the development and use of renewable energy in order to enhance the nation's energy independence, meet environmental goals, and create new economic and employment growth opportunities. GSEP would help meet these needs by:

- Assisting California in meeting its Renewable Portfolio Standard goals of 20% of retail electric power sales by 2010 under existing law (Senate Bill 1078 – Chapter 516, Statutes of 2002) and 33% of electrical power retail sales by 2020 under pending legislation;
- Supporting U.S. Secretary of the Interior Salazar's Orders 3283 and 3285 making the production, development and delivery of renewable energy top priorities for the United States;
- Supporting Governor Schwarzenegger's Executive Order S-14-08 to streamline California's renewable energy project approval process and to increase the State's Renewable Energy Standard to 33% renewable power by 2020;
- Supporting the greenhouse gas reduction goals of Assembly Bill 32 (California Global Warming Solutions Act of 2006); and.
- Sustaining and stimulating the economy of California by helping to ensure an adequate supply of renewable electrical energy, while creating additional construction and operations employment and increased expenditures in many local businesses.

DOE PURPOSE AND NEED

The Applicant has applied to the Department of Energy (DOE) for a loan guarantee under Title XVII of the Energy Policy Act of 2005 (EP Act), as amended by Section 406 of the American Recovery and Reinvestment Act of 2009, P.L. 111-5 (the Recovery Act). DOE is a cooperating agency on this EIS pursuant to a MOU between DOE and BLM, signed in January 2010. The purpose and need for action by DOE is to comply with its mandate under EP Act by selecting eligible projects that meet the goals of the Act.

The EP Act 2005 established a Federal loan guarantee program for eligible energy projects, and was amended by ARRA to create Section 1705. That section authorizes a new program for rapid deployment of renewable energy projects and related manufacturing facilities, electric power transmission projects, and leading edge biofuels projects. The primary purposes of ARRA are to promote job preservation and creation, infrastructure investment, energy efficiency and science, assistance to the unemployed, and State and local fiscal stabilization. The Section 1705 Program is designed to address the current economic conditions of the nation, in part, through renewable energy, transmission, and leading edge biofuels projects.

CEQA FUNCTIONAL EQUIVALENT AND NEPA PROCESSES

The Bureau of Land Management (BLM) and the Energy Commission have executed a Memorandum of Understanding concerning their intent to conduct a joint environmental review of the project in a single National Environmental Policy Act (NEPA)/California Environmental Quality Act (CEQA) process. It is in the interest of the BLM and the Energy Commission to share in the preparation of a joint environmental analysis of the proposed project to avoid duplication of staff efforts, to share staff expertise and information, to promote intergovernmental coordination at the local, state, and federal levels, and to facilitate public review by providing a joint document and a more efficient environmental review process.

Under federal law, BLM is responsible for processing a Right-of-Way application for a proposed project, and associated transmission lines and other facilities, to be constructed and operated on land it administers. In processing applications, BLM must comply with the requirements of NEPA, the President's Council on Environmental Quality (CEQ) Regulations For Implementing The Procedural Provisions Of The National Environmental Policy Act (NEPA) (40 CFR Parts 1500 – 1508), and BLM's NEPA Handbook (H-1790-1). Agency specific NEPA procedures require that federal agencies reviewing projects under their jurisdiction consider the environmental impacts associated with the proposed project construction and operation before making a decision.

As the lead state agency under CEQA, the Energy Commission is responsible for reviewing and ultimately approving or denying all applications to construct and operate thermal electric power plants, 50 MW and greater, in California. The Energy Commission's facility certification process carefully examines public health and safety, environmental impacts, and engineering aspects of proposed power plants and all related facilities, such as electric transmission lines and natural gas and water pipelines.

The GSEP Staff Assessment/Draft Environmental Impact Statement (SA/DEIS) includes all analyses normally contained in an Environmental Impact Report (EIR) as required by the California Environmental Quality Act (CEQA). When issuing a license, the Energy Commission is the lead state agency under CEQA, and its process is functionally equivalent to the preparation of an EIR.

The SA/DEIS is a joint CEQA (equivalent) and NEPA document drafted to meet and satisfy the regulatory needs of the CEC and BLM. As such, this document may not look like a traditional CEQA document or a traditional EIS-level NEPA document. However,

this document has been prepared under the joint effort of the Energy Commission and BLM and meets the needs and criteria of each agency from both a regulatory and analytical perspective.

To help facilitate the review of this joint document, some of the major distinctions between CEQA and NEPA are provided below:

	CEQA	**NEPA**
Purpose	Contains a substantive mandate that public agencies refrain from approving projects with significant environmental effects if there are feasible alternatives or mitigation measures that can substantially lessen or avoid those effects. Mountain Lion Foundation v. Fish and Game Commission (1997) 16 Cal.4th 105.	"NEPA procedures must ensure that environmental information is available to public officials and citizens before decisions are made and before actions are taken." (40 CFR 1500.1(b)) "NEPA's purpose is not to generate paperwork – even excellent paperwork – but to foster excellent action. The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore and enhance the environment." (40 CFR 1500.1(c))
Application	To all governmental agencies at all levels in California, including local agencies, regional agencies, and state agencies, boards, districts and commissions.	To all federal agencies.
Activities	All approvals or discretionary projects, which have not been exempted from CEQA by statute or regulation, that may result in either a direct, indirect, or cumulatively considerable physical change in the environment.	Include in every recommendation or report on proposals for legislation or other major Federal actions significantly affecting the quality of the human environment.
Regulation	Resources Agency adopted CEQA Guidelines at Public Resources Code §§ 21000 et seq. Public agencies must adopt implementing procedures.	The President's Council on Environmental Quality (CEQ) Regulations For Implementing The Procedural Provisions Of The National Environmental Policy Act (NEPA) (40 CFR Parts 1500 – 1508). Also, BLM has adopted its own NEPA procedures; see the BLM NEPA Handbook (H-

		1790-1).
Documents	Full analysis includes an EIR, which must be certified by the lead agency. In addition, the lead agency must make certain independent substantive "findings," based on substantial evidence, that potential impacts have been reduced to a level below significance, or otherwise issue a statement of overriding conditions.	All major federal actions that may result in significant impact(s) on the environment require the preparation of an EIS. The federal agency decision on the action analyzed in an EIS is announced in a Record of Decision (ROD).
Baseline	Must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time of the preparation of the environmental analysis.	The baseline under NEPA is the description of the Affected Environment. The EIS shall succinctly describe the environment of the area(s) to be affected by the alternatives under consideration (40 CFR 1502.15). The affected environment describes the environmental conditions and trends at the time the action would occur.
Analysis	Must determine whether there are potentially adverse significant effects on the environment. Lead agencies are given broad latitude in determining what is "significant" according to locally adopted "thresholds of significance." Must analyze direct, indirect and cumulative impacts.	Must analyze direct and indirect effects (see 40 CFR 1508.8), and cumulative impacts (see 40 CFR 1508.7) of the proposed action and alternatives. Include, for the Proposal, unavoidable adverse impacts, the relationship between short-term use and long-term productivity, and any irreversible or irretrievable commitments of resources (40 CFR 1502.16).
Lacking Science	No requirements to use anything other than the evidence in the record before the lead agency, unless a "fair argument" can be made that there are potentially significant impacts.	Must acknowledge whether there is incomplete or unavailable information regarding reasonably foreseeable significant adverse impacts. Must obtain such information, with original research if necessary, unless costs of obtaining it are "exorbitant" or the "means to obtain it are unknown." If unavailable, EIS must evaluate the impacts based

		on theoretical approaches generally accepted in the scientific community. (40 CFR 1502.22)
Economic and Social Impacts	Does not require any analysis of social or economic impacts, except where any such impact has a direct or indirect physical effect on the environment. Physical effects do not include economic or social impacts without any accompanying impact on the environment.	Must analyze the positive and negative economic and social effects of each alternative analyzed, where any such impact has a related physical or human impact. Human impacts may include economic, social or health impacts. In fulfillment of Environmental Justice requirements, identify any disproportionate adverse effect on low-income or minority populations associated with one or more alternatives.
Alternatives	EIR must consider "a range of reasonable alternatives" that achieves the objectives of the project, in "meaningful detail," which has been interpreted as less onerous than NEPA's "substantial treatment" standard. Need not be exhaustive of all conceivable alternatives. One must be the "no project" alternative.	An EIS must rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated. Devote substantial treatment to each alternative considered in detail. Include alternatives not within the jurisdiction of the lead agency. Include the alternative of no action. Identify the agency preferred alternative. (40 CFR 1502.14)
Mitigation Measures	Lead agency must adopt feasible mitigation measures to lessen environmental impacts, or must make a statement of overriding consideration based on substantial evidence.	EIS must include appropriate mitigation measures not already included in the proposed action or alternatives. (see 40 CFR 1502.14(f)) Also see the CEQ definition of Mitigation at 40 CFR 1508.20.

AFFECTED ENVIRONMENT

The BLM has developed the Guidance for Processing Applications for Solar Power Generation Facilities on BLM-administered land in the California Desert District (2008). Cumulatively, the BLM guidance states a "reasonably foreseeable development scenario should be developed using an 'areawide' approach selected specifically for the individual project and surrounding area. The appropriate land area to cover in analyzing

cumulative impacts may vary by resource." The BLM California Desert District, Palm Springs-South Coast Field Office -- the Federal lead agency for GSEP -- provided the area to consider for the cumulative impact analysis for the Project in pre-application meetings in July 2009. **Cumulative Impacts Figure 2** reflects the extent of the area considered in the cumulative impact analysis, which accounts for other solar projects proposed within an approximately 30-mile radius for GSEP. In accordance with BLM guidance, cumulative impacts are evaluated for each of the technical disciplines addressed in this document.

PUBLIC NOTICES, OUTREACH, AND PUBLIC AND AGENCY INVOLVEMENT

PUBLIC COORDINATION

The Energy Commission and the BLM have collaborated in their efforts to facilitate robust public participation in their joint regulatory review of the GSEP. To reach this goal, Energy Commission staff with assistance from BLM staff conducted ten discovery workshops to publicly discuss technical issues related to the proposed project, and determine if GSEP should be approved for construction and operation, and if so, under what set of conditions. These workshops formed the basis of discovery for the proceeding, and provided the public as well as local, state, and federal agencies the opportunity to ask questions about, and provide input on, the proposed project.

The Energy Commission issued notices for these workshops at least 10 days prior to the meeting. BLM provides public participation opportunities consistent with the President's Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the NEPA (40 CFR Parts 1500 – 1508), BLM Planning Regulations (43 CFR Part 1600), and respective BLM Handbooks (H-1790-1 and H-1601-1). The Bureau of Land Management and Energy Commission's outreach efforts are an ongoing and collaborative throughout the entire proceeding.

BLM'S INITIAL PUBLIC NOTICE AND OUTREACH

The Notice of Intent was published in the *Federal Register (Volume 74, No. 224)* on November 23, 2009. On December 10, 2009, the CEC, with participation from BLM, held a publicly-noticed Informational Hearing at Blythe City Hall Council Chambers in Blythe, California. On December 11, 2009, BLM held its formal Scoping Meeting at the University of California-Riverside, Palm Desert Campus. A draft scoping report was released for public review and comment in January 2010. A full listing of comments, organized by technical discipline, are included in the **Introduction** to this document.

ENERGY COMMISSION STAFF'S PUBLIC OUTREACH

Energy Commission staff provides formal notices to property owners within 1,000 feet of the proposed site and within 500 feet of a linear facility (such as transmission lines, gas lines and water lines). Staff mailed the public notices on October 6, 2009, informing the public, agencies, and elected officials of the Commission's receipt and availability of the application 09-AFC-8. Each notice contained a link to a Commission-maintained project website (http://www.energy.ca.gov/sitingcases/genesis_solar/index.html).

Libraries

On September 29, 2009, the Energy Commission staff also sent copies of the GSEP AFC to the following libraries:

Riverside Main Library 3581 Mission Inn Avenue Riverside, CA 92501	Palo Verde Valley District Library 125 West Chanslor Way Blythe, CA 92225-1245

In addition to these local libraries, copies of the AFC were also made available at the Energy Commission's Library in Sacramento, the California State Library in Sacramento, as well as, state libraries in Eureka, Fresno, Los Angeles, San Diego, and San Francisco.

Energy Commission's Public Adviser's Office

The Energy Commission's outreach program is also facilitated by the Public Adviser's Office (PAO). The PAO requested public service announcements at a variety of organizations including *The Desert Independent,* Blythe City Council, three separate Chambers of Commerce, and local (Palm Springs) television and radio stations. These notices informed the public of the Commission's receipt of the GSEP Application for Certification (AFC), and invited the public to attend the Public Site Visit (of the proposed GESP site) and Informational Hearing/BLM Scoping Meeting on December 10, 2009 in Blythe, CA.

BLM AND CEC PUBLIC WORKSHOPS

Staff from the Energy Commission and the BLM held Data Request, Data Response, and Issues Resolution Workshops in the following California communities: Blythe, Palm Desert, Palm Springs, and Sacramento. These ten (10) workshops were conducted on the following days: November 23 and 24, 2009; December 10, 18 and 31, 2009; January 6, 11 and 12, 2010; and, February 10 and 18, 2010. During each of these workshops, specific time for public participation was allocated, and public comment was taken. These workshops provided a public forum for the applicant, interveners, staff and cooperating agencies to interact regarding project issues.

Policy Level and Programmatic Agency Coordination

On August 8, 2007, the California Energy Commission and the Bureau of Land Management signed a Memorandum of Understanding (MOU) for the purpose on agreeing to prepare joint environmental documents for proposed, solar thermal projects which fall under the jurisdiction of both agencies. The MOU outlines roles and responsibilities of the cooperative process.

On October 12, 2009, California's Governor, Arnold Schwarzenegger, signed an MOU with the U.S. Department of the Interior's Secretary, Ken Salazar. The purpose of the MOU "is to direct California Agencies and Department of the Interior Agencies…to take the necessary actions to further the implementation of the Governors Executive Order S-14-08 and the Secretary's Order 3285 in a cooperative, collaborative, and timely manner". The agencies identified to in the MOU are the California Department of Fish

and Game (CDFG), California Energy Commission (CEC), Bureau of Land Management (BLM) and the U.S. Fish and Wildlife Service (FWS). The MOU also outlined specific objectives.

On January 26, 2010, the U.S. Department of the Interior's Bureau of Land Management signed a Memorandum of Understanding (MOU) with the U.S. Department of Energy's (DOE) Loan Guarantee Program (LGP) office. The purpose of the MOU is to provide a framework for the BLM and the LPG to cooperate in preparing Environmental Assessments, Environmental Impact Statements for renewable energy project's that require federal actions be taken by both the BLM and the LGP.

Project Specific Agency Coordination

On October 6, 2009, the Energy Commission staff sent a notice of receipt and a copy of the GSEP Application for Certification to all local, state, and federal agencies that might be affected by the proposed project. Staff continues to seek cooperation and or comments from regulatory agencies that administer LORS which may be applicable to proposed project. These agencies may include, as applicable, the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service (FWS), U.S. Army Corps of Engineers, U.S. Bureau of Reclamation, California Coastal Commission, Colorado River Board of California, California Department of Transportation, State Water Resources Control Board/Colorado River Regional Water Quality Control Board, California Department of Fish and Game (CDFG), and the California Air Resources Board/Mojave Desert Air Quality Management District, among others. Additionally, staff notified agencies on November 9, 2009, informing them of the availability of supplemental information for the 09-AFC-8 proceeding.

Staff, particularly the **Biological Resources** staff, worked closely with the CDFG and the FWS to evaluate the proposed GSEP, and provide analysis contained within this SA/DEIS. Both CDFG and the FWS attended and participated in public workshops to address the wildlife issues and related "Incidental Take Permits" required for the proposed GSEP. Additionally, staff has benefited from the cooperation of the CDFG in evaluating the proposed streambed alteration agreements that would normally fall under CDFG's jurisdiction if not for the Energy Commission's "in lieu" permitting authority.

Government to Government Consultation - Notification of the Local Native American Communities

BLM staff first sent letters to various tribes on November 26th 2007. The letter provided an initial briefing on the project and a request for consultation. The letters were mailed to the following fourteen (14) recipients:

1. Mr. Richard Milanovich, Tribal Chair; Agua Caliente Band of Cahuilla Indians, 5401 Dinah Shore Drive, Palm Springs, CA 92264

2. Ms. Patricia Tuck, Tribal Historic Preservation Officer, Agua Caliente Band of Cahuilla Indians, 5401 Dinah Shore Drive, Palm Springs, CA 92264

3. Ms. Bridget Nash-Chrabascz, Tribal Historic Preservation Officer, Quechan Indian Tribe, Ft. Yuma Indian Reservation P.O. Box 1899, Yuma, AZ 85366-1899

4. Mr. Robert Martin, Chairman; Morongo Band of Mission Indians. 12700 Pumarra Rd. Banning, CA 92220

5. Ms. Sherry Cordova, Chair, Cocopah Tribal Council. County 15th and Ave,G. Somerton, AZ 85350

6. Mr. Eldred Enas, Chairman, Colorado River Tribal Council. 26600 Mojave Rd. Parker, AZ 85344

7. Mr. Darrell Mike, Chairman, Twenty-Nine Palms Band of Mission Indians. 46-200 Harrison Place, Coachella, CA 92236

8. Mr. John James, Chairman; Cabazon Band of Mission Indians. 84245 Indio Springs Rd. Indio, CA 92203-3499

9. Ms. Maryann Green, Chairperson, Augustine Band of Mission Indians. P.O. Box 846 Coachella, CA 92236

10. Mr. Timothy Williams, Chairman; Fort Mojave Tribal Council. 500 Merriman Ave. Needles, CA 92363

11. Mr. Charles Wood, Chairman; Chemehuevi Tribal Council. P. O. Box 1976 Havasu Lake, CA 92363.

12. Mr. Michael Jackson, Sr., President, Fort Yuma Quechan Tribe. P.O. Box 1899, Yuma, AZ 85366-1899

13. Mr. James Ramos, Chairman; San Manuel Band of Mission Indians. P.O. Box 266, Patton, CA 92369

14. Ms. Mary Resvaloso, Chairwoman; Torres-Martinez Desert Cahuilla Indians. P.O. Box 1160, Thermal, CA 92274-1160

Replies were received from the following three (3) Tribes requesting reports, expressing concerns, or referring to neighboring groups whom may have an interest in the project area.

1. Ms. Patricia Tuck, Tribal Historic Preservation Officer, Agua Caliente Band of Cahuilla Indians, 5401 Dinah Shore Drive, Palm Springs, CA 92264

2. Ms. Bridget Nash-Chrabascz, Tribal Historic Preservation Officer, Quechan Indian Tribe, Ft. Yuma Indian Reservation P.O. Box 1899, Yuma, AZ 85366-1899

3. Mr. Britt W. Wilson, Project Manager-Cultural Resources; Morongo Band of Mission Indians. 12700 Pumarra Rd. Banning, CA 92220

A second set of letters were mailed to tribes on November 23, 2009, identifying the Notice of Intent (NOI) and requesting for comments and/or specific concerns. The letter also designated the deadline for the comment period (December 23, 2009). These letters were sent to the same aforementioned fourteen (14) addressees.

On February 22, 2010, the BLM sent an update letter containing information about project review; CEC-BLM workshops that were held in December, 2009 and January/February, 2010; Native American input; the upcoming release of the SA/EIS; cultural resources surveys from summer 2009 and winter 2010; as well as invitations for tribes to consult on eligibility evaluations of archeological sites and the Programmatic Agreement (PA) being prepared by BLM, the State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation (ACHP).

SUMMARY OF SCOPING COMMENTS IN RESPONSE TO THE BLM'S NOTICE OF INTENT

Summary of the Scoping and Draft Comment Process

The Notice of Intent for GSEP was published in the *Federal Register (Volume 74, No. 224)* on November 23, 2009. On December 10, 2009 the CEC with participation from BLM held a publicly-noticed Informational Hearing at Blythe City Hall, Council Chambers in Blythe, California. On December 11, 2009, BLM held its primary Scoping Meeting at the University of California-Riverside, Palm Desert Campus. A draft scoping report was released for public review and comment in January 2010.

Original scoping comment letters submitted by members of the public (letters from both individuals and letters submitted by groups on behalf of members) may be reviewed upon request at the BLM Palm Springs-South Coast Field Office,1201 Bird Center Drive, Palm Springs, California, 92262.

These scoping comment issues were identified by reviewing the comment documents received. Many of the comments identified similar issues; all of the public comment documents were reviewed and the **Introduction** section of this document provides a complete summary of the issues, concerns, and/or questions raised. Issues are grouped into one of the three following categories:

- Issues or concerns that could be addressed by effects analysis;
- Issues or concerns that could develop an alternative and/or a better description or qualification of the alternatives;
- Issues or concerns outside the scope of the Environmental Impact Statement

The matrix below reflects specific issues articulated by non-profit and community-based organizations representing members of the public interested in a wide-array of issues related to the construction and operation of the Genesis Solar Energy Project. These organizations (and others) submitted Notice of Intent (NOI) comment letters on or before December 23, 2009. Many of the NOI comments and scoping comments identified similar issues. The matrix below was developed to provide a general sense of issues articulated by these organizations. Issue-by-issue descriptions for all scoping comments are listed by technical area in the **Introduction** section of this SA/DEIS.

NOTICE OF INTENT (NOI) COMMENTS MATRIX
GENESIS SOLAR ENERGY PRJOECT

NAME	DATE	PROCESS/FAST TRACK/LNP	ALTERNATIVES	AIR / HEALTH	BIOLOGY / BOTANY/RES	CLIMATE CHANGE	CULTURAL / NATIVE AMERICAN	ECONOMIC/SOCIOECONOMIC	OTHER_CONSIDERATIONS/CUMULATIVE IMPACT	TRAFFIC/ACCESS	WATER/HYDROLOGY	VISUAL/VRM/AESTHETICS	WILDLIFE/T&E/HABITAT	LIGHTING/PUBLIC UTILITIES	DESIGN	FLOODING	RECREATION/OHV	SOIL/GEOLOGY	HAZMAT	NOISE	ADD TO MAILING
California Native Plant Society	12/23/2009				X				X		X	X									
California Unions for Reliable Energy (CURE)	12/23/2009			X			X	X	X		X	X	X		X			X		X	
Center for Biological Diversity	12/29/2009	X		X	X	X			X		X	X	X					X			
A McPherson, US EPA Reg. 9	12/23/2009		X	X	X	X				X											
J. Aardahl Defenders of Wildlife	12/23/2010		X		X				X				X								
Western Watersheds Project	11/30/2009		X		X	X			X		X	X	X					X			
CARE, Arturo Figueroa	12/23/2009	X	X	X	X	X	X	X	X		X	X	X								
M. J. Connor PH.D Western Watershed Project	12/23/2009	X	X		X	X	X		X		X	X	X					X			
Off-Road Business Association, Inc.	12/23/2009			X		X				X											

ENVIRONMENTAL JUSTICE

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," focuses federal attention on the environment and human health conditions of minority communities and calls on federal agencies to achieve environmental justice as part of this mission. The Order requires the United States Environmental Protection Agency (US EPA) and all other federal agencies to develop strategies to address this issue. The agencies are required to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority or low-income populations. Some agencies have also interpreted this Order as applying to state agencies that receive federal funding. Energy Commission staff assumes that the Order applies, and conducts the appropriate analysis accordingly.
This analysis is also necessary to satisfy BLM's obligations under Executive Order 12898. In considering environmental justice in energy facility siting cases, staff uses a demographic screening analysis to determine whether a low-income and/or minority population exists within the potentially affected area of the proposed site. The demographic screening is based on information contained in two documents: "Environmental Justice: Guidance Under the National Environmental Policy Act" (Council on Environmental Quality, December, 1997) and "Guidance for Incorporating Environmental Justice Concerns in EPA's Compliance Analyses" (U.S. Environmental Protection Agency, April, 1998).

The Environmental Justice screening process relies on Year 2000 U.S. Census data to determine the presence of minority and below-poverty level populations. Environmental Justice: Guidance Under the National Environmental Policy Act, defines minority individuals as members of the following groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. A minority population is identified when the minority population of the potentially affected area is:

1. greater than 50%; or

2. present in one or more US Census blocks where a minority population of greater than 50% exists.

In addition to the demographic screening analysis, staff follows the steps recommended by the U.S. EPA's guidance documents in regard to outreach and involvement; and if warranted, a detailed examination of the distribution of impacts on segments of the population.

Staff has followed each of the above steps for the following eleven (11) sections in the SA/DEIS: **Air Quality, Hazardous Materials, Land Use, Noise, Public Health, Socioeconomics, Soils and Water, Traffic and Transportation, Transmission Line Safety/Nuisance, Visual Resources,** and **Waste Management**. Over the course of the analysis for each of these eleven technical disciplines, staff considered potential impacts and mitigation measures, and whether there would be a significant impact on an environmental justice population. Staff determined that the remaining technical areas did not involve potential environmental impacts that could contribute to a

disproportionate impact on an environmental justice population, and so did not necessitate further environmental justice analysis for those areas.

PROJECT'S COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Based upon the information provided, discovery achieved and analysis completed to date, staff has concluded that with just two exceptions, the implementation of its recommended mitigation measures – described in the conditions of certification – will mitigate all potential environmental impacts of the GSEP to a level of less than significant. Therefore, the project analysis complies with the requirements of the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). For a detailed review of potentially significant impacts and the related mitigation measures (conditions of certification), please refer to each chapter of this SA/DEIS.

Within the technical areas of **Air Quality** and **Transmission System Engineering,** additional information is necessary and required in regard to specific issues that are described in the sections' summary of conclusions. These are outstanding issues that will be resolved through the course of the Staff Assessment (SA) Workshops and subsequent filings, and will be reflected in a Supplemental Staff Assessment (SSA).

As noted in the **Land Use** and **Visual Resources** sections, cumulative impacts would be significant and would not be mitigated to less than significant levels. Therefore, if this project were to be approved, an override consideration may be necessary.

Staff also concludes that with implementation of staff's recommended mitigation measures described in each technical section's conditions of certification, GSEP would comply with all applicable laws, ordinances, regulations, and standards (LORS), except as described in the **Soil and Water Resources** section.

Specifically, the state of California has expressed a strong interest in developing its solar energy resources. However, the construction and operation of solar energy facilities requires the use of water, which state policy also protects. The Energy Commission must balance the state's interest in promoting solar energy development with its interest in conserving and protecting the state's water resources. GSEP proposes to use water for power plant cooling, which staff believes is contrary to the state's long term interest in maximizing solar power generation and minimizing adverse environmental impacts.

This will be an especially critical issue in the renewable development areas that will be identified in the joint state/federal Renewable Energy Action Team's Desert Renewable Energy Conservation Plan (DRECP). Therefore, staff proposes that the project prepare a Water Conservation Plan that outlines the actions necessary to bring the project cooling water use into compliance with the state's water policies. Later this year, Energy Commission staff plans to file a request for an Energy Commission Order Instituting an Informational Proceeding to address the overall issue of water use (particular groundwater use) by solar thermal power plants. For a more detailed discussion of

water policy and related LORS, see staff's technical analysis in the **Soil and Water Resources** section of this SA/DEIS.

SUMMARY OF ENVIRONMENTAL IMPACTS AND RELATED MITIGATION (FOR ENERGY COMMISSION AND CEQA PURPOSES)

With the exception of the technical areas identified below, Energy Commission staff believes that as currently proposed, including the applicant's and the staff's proposed mitigation measures and the staff's proposed conditions of certification, the proposed GSEP would comply with all applicable laws, ordinances, regulations, and standards (LORS).

Summary of Genesis Solar Energy Project SA/DEIS Technical Analyses

Technical Area	Complies with LORS	Impacts Mitigated
Air Quality	Yes	Yes
Alternatives	Not Applicable	Not Applicable
Biological Resources	Yes	Yes
Cultural Resources	Yes	undetermined
Cumulative	Yes	Yes
Efficiency	Not Applicable	Not Applicable
Facility Design	Yes	Yes
Geology and Paleontology	Yes	Yes
Hazardous Materials	Yes	Yes
Land Use	Yes	**No***
Noise and Vibration	Yes	Yes
Public Health	Yes	Yes
Reliability	Not Applicable	Not Applicable
Socioeconomic Resources	Yes	Yes
Soil and Water Resources	**No**	Yes
Traffic and Transportation	Yes	Yes
Transmission Line Safety/Nuisance	Yes	Yes
Transmission System Engineering	Yes	Yes
Visual Resources	Yes	**No***
Waste Management	Yes	Yes
Worker Safety and Fire Protection	Yes	Yes

*cumulative impacts

SUPPLEMENTAL STAFF ASSESSMENT

Based on Staff Assessment (SA) workshops and written comments, staff may refine its analysis, correct errors, and finalize conditions of certification to reflect areas where agreements have been reached with the parties, and will then publish a Supplemental Staff Assessment/Final Environmental Impact Statement (SSA/FEIS). The SSA/FEIS will be a limited document representing revisions and additions to technical areas

discussed below, rather than a document including discussion for each technical section.

Air Quality

Staff will need to receive/review a Final Determination of Compliance (FDOC) from the Mojave Desert Air Quality Management District (MDAQMD), including the review and incorporation of revisions made by MDAQMD to address staff and other party comments on the Preliminary Determination of Compliance. This analysis will likely require revisions to both staff and MDAQMD-recommended conditions of certification.

Cultural Resources

Issue discussions in the SSA will include the following:

- Mitigation for project impacts to cultural resources that will be handled in a Programmatic Agreement (PA) negotiated among all stakeholders -- federal, state, and private – including critically important resources, with ongoing input for Native American organizations. Development of the PA by the BLM and the State Historical Preservation Office is underway.
- The data compilation for the cumulative analysis is also ongoing, and that analysis will be included in the SSA.
- BLM is compiling information on its consultation with Native Americans, required by NHPA Sec. 106. An account of this consultation will be included in the SSA.

With the finalization and implementation of the PA, staff expects all project impacts will be mitigated. Staff is expecting no additional information from the applicant.

Land Use

Staff concluded that the GSEP (and its alternatives) would combine with other past and reasonably foreseeable future projects to substantially reduce scenic values of wilderness areas and recreational resources in the Chuckwalla Valley and southern California desert region and therefore, would result in a significant and unavoidable cumulative land use impact. These cumulative visual impacts would be significant in terms of CEQA, and would not be mitigated to less than significant levels. Therefore, if this project were to be approved, an override consideration would be necessary

Soil & Water Resources

Final completion of staff's analysis of the proposed project is subject to the following:

- Submittal of a Water Conservation Plan.
- Submittal of the following to the Colorado River Regional Quality Control Board (RWQCB) and County of Riverside for review and comment and to the Energy Commission for approval:
  - Engineering design detail and groundwater monitoring plans for the proposed wastewater evaporation ponds;
  - Engineering design detail and groundwater monitoring plans for the proposed Heat Transfer Fluid (HTF) fluid bioremediation units;

- Characterization of the anticipated waste streams proposed to be discharged into the evaporation ponds and bioremediation units;
- A description of the frequency and chemical analysis of waste and a plan that describes actions that will be taken in case of a detectable release;
- A closure plan for the evaporation ponds and bioremediation units; and
- Demonstration that the proposed project would be in compliance with Order 2009-0009-DWQ Storm Water requirements that take effect July 1, 2010.

- Submittal of the applicant's final, 100 percent engineering and design for GSEP's storm water diversion channel(s) will need to be reviewed for final comment and approval by the Energy Commission.

Transmission System Engineering

The applicant will need to provide environmental information for downstream congestion management improvements in order for staff to finalize their analysis on proposed, necessary transmission improvements. Such improvements will be stipulated in a forthcoming (Fall 2010) Phase II Interconnection Study.

Visual Resources

Staff concluded that the proposed project would result in a substantial adverse cumulative impact to existing scenic resource values as seen from several wilderness viewing areas and Key Observation Points north of the project in the vicinity of the McCoy and Palen Mountains. These cumulative visual impacts would be significant in terms of CEQA, and would not be mitigated to less than significant levels. Therefore, if this project were to be approved, an override consideration would be necessary.

BLM'S PREFERRED ALTERNATIVE (FOR BLM AND NEPA PURPOSES)

BLM's objective is to select an alternative that is inclusive of the purpose and need of the project and adequately addresses the environmental issues while still maintaining the proposed project output. Currently, the BLM has identified the Proposed project with dry cooling as the preferred alternative in the SA/DEIS. As the BLM and CEC progress through the process, analysis of both public and agency comment will weigh heavily in the selection of the final preferred alternative that will presented in the SSA/FEIS.

RECOMMENDATIONS

The SA/DEIS is a document of the Energy Commission staff that has been developed and written with staff from the Bureau of Land Management. Accordingly, by its very nature, the conclusions and recommendations presented herein are considered staff's analysis of the project, and its testimony hereto. In summary, this SA/DEIS finds that with one exception, the Genesis Solar Energy Project is in conformance with all LORS. Where Project impacts were identified, BLM and Energy Commission staff recommends mitigation to offset direct, indirect, and cumulative impacts and to assure compliance with state and federal laws such as the federal and state endangered species acts. With

implementation of staff's proposed conditions of certification, Project impacts would be reduced to less than significant levels.

CONCLUSIONS

Staff will work to resolve any outstanding issues and update the SA/DEIS prior to Evidentiary Hearings, which are scheduled to commence on July 19, 2010 in Blythe, California. Based on Staff Assessment (SA) workshops planned for early May, 2010, written comments and input from the public, agencies and other parties to this proceeding, staff may refine its analyses, correct errors, and finalize conditions of certification to reflect areas where agreements have been reached with the parties. All these updates to the SA/DEIS, coupled with responses to public comments, will be reflected in the BLM/Energy Commission Supplemental Staff Assessment /Final Environmental Impact Statement (SSA/FEIS) for GSEP, currently scheduled for publication in late August, 2010.

REFERENCES

BLM 2007a – Bureau of Land Management/J. Kalish (tn: 55562) Cultural Resources, Native American community letter. 11/26/2007

CARE 2009a – Californians for Renewable Energy/A. Figueroa (tn:54562) Comments on NOI of the Genesis Solar Energy Project. 12/23/2009

CBD 2009a – Center for Biological Diversity/I. Anderson (tn: 54601). Comments on the Notice of Intent to Prepare an Environmental Impact Statement. 12/29/2009

CEC 2009b – California Energy Commission/E. Allen (tn:53587) Request for Agency Participation in the Genesis Solar Energy Project. 10/6/2009

CURE 2010a – California Unions for Reliable Energy / T. Gulessarian (tn:54997) Comments on the Notice of Intent to Prepare an Environmental Impact Statement. 12/23/2009

EPA 2009a – Environmental Protection Agency/A. McPherson (tn:54333) Scoping comment letter for the Genesis Solar Energy Project. 11/30/2009

OFRD 2009a – Offroad Business Association (tn:54552) Scoping comment letter for the Genesis Solar Energy Project. 12/22/2009

QIT 2010a – Quenchan Indian Tribe/ M. Jackson (tn: 55835) Section 106 Consultation Process Letter. 2/16/2010

WILD 2009a – Defenders of Wildlife/J. Aardahl (tn: 54684) Issue Scoping Comments – Proposed NextEra Ford Dry Lake Solar. 12/23/2009

A. - INTRODUCTION

Mike Monasmith

This Staff Assessment /Draft Environmental Impact Statement (SA/DEIS) is a joint document being published by the U.S. Bureau of Land Management (BLM) and the California Energy Commission (CEC). It is in the interest of the BLM and the Energy Commission to share in the preparation of a joint environmental analysis of the proposed project to avoid duplication of staff efforts, to share staff expertise and information, to promote intergovernmental coordination at the local, state, and federal levels, and to facilitate public review by providing a joint document and a more efficient environmental review process.

This SA/DEIS contains U.S. Bureau of Land Management and Energy Commission staffs' (hereafter jointly referred to as staff) independent evaluation of the Genesis Solar, LLC (applicant) Genesis Solar Energy Project (GSEP) application, which was filed with the BLM and CEC. The application filed with BLM is the BLM Application for a Right-of-Way Grant on BLM-administered land (CACA 048880) and the application filed with the Energy Commission is the Application for Certification (09-AFC-8). The SA/DEIS examines engineering, environmental, public health and safety aspects of the Genesis Solar Energy Project (GSEP), based on the information provided by the applicant and other sources available at the time the SA/DEIS was prepared. For the BLM, the SA/DEIS will also include a Draft Land Use Plan Amendment (Draft PA) to the California Desert District Plan (1980) as Amended.

The applicant has also applied for the American Recovery and Reinvestment Act (ARRA) Renewable Energy Grant Program. Two goals of the ARRA Renewable Energy Grant Program are to enhance America's energy independence and create near-term employment opportunities for Americans. To be eligible for the ARRA funds, the applicant must begin construction on GSEP by the end of 2010.

This SA/DEIS serves as staffs' analysis of the engineering, environmental, public health and safety aspects of the proposed project, based on the information provided by the applicant and other sources available at the time the SA/DEIS was prepared. The SA/DEIS includes analyses normally contained in an Environmental Impact Report (EIR) as required by the California Environmental Quality Act (CEQA), as well as analyses required as part of an EIS prepared under the National Environmental Policy Act (NEPA). The SA/DEIS is available for a 90-day public comment period beginning April 9, 2010. The Notice of Availability (NOA) (published by the EPA in the *Federal Register*) will initiate the 90-day public review and comment period.

When considering a project for licensing, the Energy Commission is the lead state agency under CEQA, and its process is functionally equivalent to the preparation of an EIR. Similarly, BLM is the lead Federal agency for the NEPA review of the proposed Right-of-Way and possible Land Use Plan Amendment. The Energy Commission and the BLM are engaging in concurrent review processes. The following explains in more detail the steps each agency will take to complete review.

In support of its certification process, the Energy Commission staff has the responsibility to complete an independent assessment of the project's engineering design and its potential effects on the environment, on the public's health and safety, and whether the project conforms with all applicable laws, ordinances, regulations and standards (LORS). The staff also recommends measures to mitigate potential significant adverse environmental effects and conditions of certification for construction, operation, maintenance and eventual decommissioning of the project..

This SA/DEIS is not the decision document for these proceedings, nor does it contain findings of the Energy Commission related to environmental impacts or the project's compliance with local/state/federal legal requirements. The SA/DEIS will serve as staff's testimony in evidentiary hearings to be held by the Energy Commission's Genesis Solar Energy Project Committee, consisting of two Commissioners overseeing this case. The Committee will hold evidentiary hearings and will consider the recommendations presented by staff, the applicant, all parties, government agencies, and the public prior to proposing its decision. The entire Energy Commission will make a final decision, including findings, after the Committee's publication of its proposed decision. The Commission's final decisions on power plant AFCs are subject to judicial review by the Supreme Court of California (Pub. Res. § 25531.)

In support of the processing of the Right-of-Way (ROW) Application and CDCA Plan Amendment processes, the BLM has the responsibility to evaluate the environmental impacts of the proposed action, the No Action alternative, and other alternatives that may meet the purpose and need for the proposed project or identify the need for additional planning amendments that could mitigate cumulative effects.

The BLM has determined that the proposed site for the Genesis project is not identified in the California Desert Conservation Area (CDCA) Plan as associated with power generation or transmission. The requested ROW cannot be granted unless such a grant would be consistent with the terms of the CDCA Plan. Therefore, BLM must amend the Plan to allow power generation and transmission at the proposed site as a prerequisite to granting the ROW. As part of the DEIS, BLM will identify its preferred alternative and will also present a potential Draft Plan Amendment to the CDCA Plan to allow for the project if a ROW is granted.

Following the 90-day public comment period, BLM and CEC staff will review and develop responses to comments provided by the public and other agencies, and plan to publish the response in August, 2010. The responses to the comments, and other relevant information identified during this period, will be incorporated into the Supplemental Staff Assessment/Final EIS (SSA/FEIS), which will also identify for BLM a Proposed Land Use Plan Amendment (Proposed PA). The NOA (published by the EPA in the *Federal Register*) will initiate a 30-day protest period on the Proposed PA to the Director of the BLM. Protests regarding the Proposed PA must be sent in writing to the Director of the BLM and comply with the protest procedures described in 43 CFR § 1610.5-2. Following resolution of any protests regarding proposed CDCA Plan Amendments, BLM may then publish an Approved Plan Amendment and a Record of Decision (ROD) on the Project Application. The decision regarding the ROW grant is appealable to the Interior Board of Land Appeals upon issuance of the ROD.

A.1 AGENCY AUTHORITIES AND RESPONSIBILITIES

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 Commission and BLM typically seek comments from and work closely with other regulatory agencies administering LORS that may be applicable to the proposed project. The following paragraphs describe the agency coordination that has occurred throughout this joint SA/EIS process.

A.1.1 U.S. BUREAU OF LAND MANAGEMENT (BLM)

The Bureau of Land management's authority for the proposed action is the Federal Land Policy and Management Act (FLPMA) of 1976 [43 United States Code (U.S.C.) 1701 et seq.], The proposed action is consistent with Section 211 of the Energy Policy Act (EP Act) of 2005 (119 Stat. 594, 600), and BLM's Solar Energy Development Policy of April 4, 2007. The FLPMA authorizes BLM to issue right-of-way grants for renewable energy projects. Section 211 of the Energy Policy Act of 2005 states that the Secretary of the Interior should seek to have approved a minimum of 10,000 megawatts of renewable energy generating capacity on public lands by 2015.

A.1.2 CALIFORNIA ENERGY COMMISSION (CEC)

The Energy Commission has the exclusive authority to certify the construction, modification, and operation of thermal electric power plants 50 megawatts (MW) or larger in the state. 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, 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, sections 25500 et seq.; Title 20, California Code of Regulations, sections 1701 et seq.; and CEQA (Pub. Resources Code, §§ 21000 et seq.).

A.1.3 US FISH AND WILDLIFE SERVICE (USFWS) AND THE CALIFORNIA DEPARTMENT OF FISH AND GAME (CDFG)

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 is likely to adversely affect a federally-listed species. This consultation will be initiated 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 may issue a Biological Opinion (BO) which will specify mitigation measures that must be implemented for any protected species.

California Department of Fish and Game

The California Department of Fish and Game (CDFG) has 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 a Streambed Alteration Agreement with CDFG. The requirements of the Streambed Alteration Agreement will be included as a recommended Condition of Certification/Mitigation Measure.

CDFG also has the authority to regulate potential impacts to species that are protected under the California Endangered Species Act (CESA). Accordingly, the applicant for the Genesis Solar Energy Project has filed the appropriate incidental take permit applications. The requirements of the Incidental Take Permits will be included as a recommended Condition of Certification/Mitigation Measure discussed in the Biological Resources section of this document.

A.1.4 OTHER AGENCIES WITH AUTHORITY

U.S. Army Corps of Engineers

The U.S. 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, or are subject to a Section 404 permit. Throughout the SA/DEIS process, the Energy Commission and BLM have provided information to the USACE to assist them in making a determination regarding their jurisdiction and need for a Section 404 permit.

Mojave Desert Air Pollution Management District

The project site is located in the Mojave Desert Air Basin[1] and is under the jurisdiction of the Mojave Desert Air Quality Management District (District). Based upon the authorities in 40 Code of Federal Regulations (CFR) Part 52 and 40 CFR Part 60, the District is responsible for issuing the federal New Source Review (NSR) permit and has been delegated enforcement of the applicable New Source Performance Standard (Subpart IIII).

California Department of Transportation

The department of transportation has jurisdiction over encroachments to Caltrans facilities and related easements and rights-of way.

Riverside County

The County of Riverside has jurisdiction to issue building permits to the GSEP. Building permits issued by the county are considered ministerial in nature. The county also has

[1] The Mojave Desert Air Basin lies inland southeast of the San Joaquin Valley Air Basin, and northeast of the South Coast Air Basin. The desert portions of Kern, San Bernardino, Riverside, and Los Angeles counties are within its boundaries.

jurisdiction to issue discretionary approvals for any easements, rights-of-way and or encroachment permits where county facilities are concerned.

Other Agencies

For a comprehensive review of all agencies and their corresponding permits, licenses, and other LORS conformance for specific areas, see staff's technical analyses in the SA/DEIS.

A.2 CASE AND PROPERTY DESCRIPTION

The Genesis Solar Energy Project (GSEP) is located approximately 25 miles west of the city of Blythe, California, on BLM-administered land. The project area is south of the Palen/McCoy Wilderness Area and north of Ford Dry Lake and Interstate 10.

The proposed GSEP is entirely on BLM-administered land located in Township 6S Range 18E and Township 6S Range 19E, San Bernardino Base and Meridian. A summary legal description for the BLM ROW application is provided in the following Table.

The applicant is seeking a right-of-way grant for approximately 4,640 acres of land administered by the BLM. Construction and operation of the project would disturb a total of about 1,800 acres. As such, any difference between the total acreage listed in the Right-of-Way application (4,640) and the total acreage required for project construction and operation (approx. 1,800) would be excluded from the ROW grant, if BLM decides to approve the project.

The Project area is located in eastern Riverside County, where land use is characterized predominantly by open space and conservation and wilderness areas. The western portion of the county accounts for most of the developed area of the county, including urban areas and agricultural areas. The southeastern corner of the county to the east of the Project also contains limited agricultural areas and rural development (Riverside County, 2003). The following Riverside County Assessor's Parcel Number's apply to the parcels within the overall ROW and linear corridor boundary: 810290005-810290008, 810410013, 810410019, 810410014, 810410026, 810410002, 810410021, 810410015, 810410022, 810410023, 810410027-810410029, 810420012, 818040010, 818070001-818101003, 818111008, 818112004,879020025. 810410002, 810410021, 810410015, 810410022, 810410023, 810410027-810410029, 810420012, 818040010, 818070001-818101003, 818111008, 818112004,879020025.

A.3 BLM LAND USE PLAN CONFORMANCE

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.

The BLM has determined that a Land Use Plan Amendment is required because the proposed site for the GSEP is not identified in the California Desert Conservation Area (CDCA) Plan as associated with power generation or transmission lines greater than 161kV. The requested ROW grant cannot be approved unless it would be consistent

with the terms of the CDCA Plan or subsequent amendments. Therefore, the BLM must consider amending the CDCA Plan to allow power generation and transmission at the proposed GSEP site as a prerequisite to granting the ROW. As part of this DEIS, the BLM will identify its preferred alternative and will also present a potential Draft PA to the CDCA Plan to allow for the project if a ROW is granted.

These Land Use Plan Amendments could further address minimizing the cumulative effects of large scale renewable projects along the I-10 Corridor. Proposed Land Use Plan Amendments are depicted in Alternatives Appendix B and include consideration of those areas, both inside and outside the project footprint, that could be managed specifically for ROW avoidance or exclusion areas, habitat conductivity and targeted acquisition areas that would function for compensatory mitigation for sensitive species.

In the CDCA Plan, the location of the proposed BSPP 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 BSPP 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.

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 BSPP 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 the proposed project Application for Consideration to the CEC, the application for grant of Right of Way (ROW) to the BLM, and the proposed CDCA Plan Amendment by the BLM. 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 effects 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 that 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.

Conformance of ROW Application with Decision Criteria (BLM)

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 RiversideCounty 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 CEQA PROJECT OBJECTIVES

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:

- To construct and operate an environmentally and economically sound, and operationally reliable solar power generation facility that will contribute to the State of California's renewable energy goals;
- To locate the project in an area with high solar insolation (i.e., high intensity of solar energy);
- To fulfill Governor Schwarzenegger's and Secretary Salazar's Memorandum of Understanding to expedite renewable energy development in California.

The specific objectives and purpose of GSEP as identified by the applicant are:

- To develop a utility-scale solar energy project utilizing parabolic trough technology;
- To construct and operate an environmentally friendly, economically sound, and operationally reliable solar power generation facility that will contribute to the State of California's renewable energy goals;
- To locate the project in an area with high solar insolation (i.e., high intensity of solar energy);
- To interconnect directly to the CAISO Grid through the SCE electrical transmission system; and
- To commence construction in 2010 to qualify for the American Recovery and Reinvestment Act (ARRA) of 2009's Renewable Energy Grant Program.

The applicant has proposed this project in light of the recently enacted State of California legislation and goals, which includes Senate Bill 1078, passed in 2002, establishing the California Renewable Portfolio Standard (RPS). It requires utilities to increase their sale of electricity produced by renewable energy sources, including solar facilities, by a minimum of one percent per year with a goal of 20 percent of their total sales by 2017. However, the California Public Utilities Commission, 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. The California Senate then passed Senate Bill 107 to be consistent with the EAP and accelerated the implementation of RPS, requiring utilities to meet the goal of 20 percent 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.

GSEP would be built in an area with high potential for solar resource development. 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.

A.5 BLM PURPOSE AND NEED

The BLM's purpose and need for the GSEP is to respond to the applicant's application under Title V of the FLPMA (43 USC 1761) for a Right-Of-Way (ROW) Grant to construct, operate and decommission a concentrated solar thermal electric generating 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 the applicant for the proposed GSEP.

In addition, there are no existing roads suitable for vehicular access to, or around, the project site. Thus, site access will also be analyzed and, if the project is approved or approved with modification, any new or existing roads required for construction, operation, or decommissioning of the project will be designated as either open, limited, or closed to off-road vehicles, consistent with criteria established in 43 CFR 8342.1.

BLM's action will also include concurrent consideration of amending the California Desert Conservation Plan of 1980, as amended (CDCA). The decision the BLM will make is whether or not to grant a ROW and if so, under what terms and conditions, (and whether to amend the CDCA).

A.6 PROJECT EVALUATION AND APPROVAL PROCESS

This Staff Assessment /Draft Environmental Impact Statement (SA/DEIS) is a joint document being published by the U.S. Bureau of Land Management (BLM) and the California Energy Commission (CEC). It is in the interest of the BLM and the Energy Commission to share in the preparation of a joint environmental analysis of the proposed project to avoid duplication of staff efforts, to share staff expertise and information, to promote intergovernmental coordination at the local, state, and federal levels, and to facilitate public review by providing a joint document and a more efficient environmental review process.

This SA/DEIS contains staff's independent evaluation of the applicant's applications which were filed with the BLM and CEC. The application filed with BLM is the BLM Right-of-Way Application (CACA 048880) and the application filed with the Energy Commission is the Application for Certification (09-AFC-8). The SA/DEIS examines engineering, environmental, public health and safety aspects of Genesis Solar Energy Project (GSEP), based on the information provided by the applicant and other sources available at the time the SA/DEIS was prepared.

This SA/DEIS is not the decision document for these proceedings nor does it contain final findings of the BLM or Energy Commission related to environmental impacts or the project's compliance with local/state/federal legal requirements. Following a 90-day public comment period on the SA/DEIS, the SA/DEIS will be supplemented by staff's Supplemental Staff Assessment/Final Environmental Impact Statement (SAE/FEIS), which will serve as staff's final testimony.

A.6.1. BLM EVALUATION AND APPROVAL PROCESS

The SA/DEIS will also include for BLM a Draft Land Use Plan Amendment (Draft PA) to the California Desert District Plan (1980) as Amended. A 90-day public review and comment period will be provided on the SA/DES (initiated by the NOA published by the U.S. EPA in the *Federal Register*). The SSA/FEIS will include, for BLM, a Proposed Land Use Plan Amendment (Proposed PA). That NOA (published by the EPA in the *Federal Register*) will initiate a 30-day protest period on the Proposed PA to the Director of the BLM. Following resolution of any protests BLM may then publish an Approved Plan Amendment and a Record of Decision (ROD) on the Project Application.

Under the NEPA process, the significance of the impacts are 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;
- Whether the action is related to other actions with individually insignificant but cumulatively significant impacts 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 CEQ NEPA regulations 40 CFR 1502.16, the analysis also includes a discussion of both direct and indirect effects and their significance, adverse environmental effects which cannot be avoided, the relationship between short-term

uses of man's environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources.

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

A.6.2. CEC EVALUATION AND APPROVAL 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., title 20, § 1744(b)).

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

Staff's impact assessment, including the recommended conditions of certification, is only one piece of evidence that the Committee assigned to oversee the Genesis Solar Energy Project AFC will consider in reaching a decision on the proposed project and making its recommendation to the full Energy Commission for its ultimate consideration and action. At the public evidentiary 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 assigned Committee also allows 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 Committee's recommendation to the full Energy Commission on whether 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 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.

A.6.3. JOINT NEPA/CEQA PROCESS

The BLM and the Energy Commission have executed a Memorandum of Understanding concerning their intent to conduct a joint environmental review of the project in a single

National Environmental Policy Act (NEPA)/California Environmental Quality Act (CEQA) process. It is in the interest of the BLM and the Energy Commission to share in the preparation of a joint environmental analysis of the proposed project to avoid duplication of staff efforts, to share staff expertise and information, to promote intergovernmental coordination and collaboration at the local, state, and federal levels, and to facilitate public review and participation by providing a joint document and a more efficient environmental review process.

A.6.4. AGENCY COORDINATION

The Energy Commission and BLM seek comments from, and work closely with, other regulatory and wildlife agencies that administer LORS applicable to proposed project. These agencies may include as applicable, the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, U.S. Bureau of Reclamation, California Coastal Commission, California River Board of California, California Department of Transportation, State Water Resources Control Board/Colorado River Regional Water Quality Control Board, California Department of Fish and Game, the California Air Resources Board and the Mojave Desert Air Quality Management District. On October 6, 2009, the Energy Commission staff sent the GSEP AFC to all local, state, and federal agencies that might be affected by the proposed project. Additionally, on November 9, 2009, staff mailed agencies a subsequent letter informing them of receipt and availability of supplemental information for the 09-AFC-8 application.

A.7 PUBLIC COORDINATION

SUMMARY OF THE SCOPING AND DRAFT COMMENT PROCESS

PUBLIC COORDINATION

The Energy Commission and the BLM have collaborated in their efforts to facilitate robust public participation in their joint regulatory review of the GSEP. As a means towards this goal, a number of public workshops and hearings have occurred on the proposal to determine whether the proposed project should be approved for construction and operation, and if so, under what set of conditions. These workshops and hearings provided the public, as well as local, state and federal agencies, the opportunity to ask questions about and provide input on the proposed project. The Energy Commission issued notices for these workshops and hearings at least 10 days prior to the meeting. BLM will provide public participation opportunities consistent with the President's Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the NEPA (40 CFR Parts 1500 – 1508), BLM Planning Regulations (43 CFR Part 1600), and respective BLM Handbooks (H-1790-1 and H-1601-1).

The Bureau of Land Management and Energy Commission's outreach efforts are an ongoing process that, to date, has involved the following efforts:

BLM SCOPING MEETING

The Notice of Intent was published in the *Federal Register (Volume 74, No. 224)* on November 23, 2009. On December 10, 2009 the CEC with participation from BLM held a publicly-noticed Informational Hearing at Blythe City Hall, Council Chambers in Blythe, California. On December 11, 2009, BLM held its primary Scoping Meeting at the University of California-Riverside, Palm Desert Campus. A draft scoping report was released for public review and comment in January 2010.

Issues were identified by reviewing the comment documents received. Many of the comments identified similar issues; all of the public comment documents were reviewed and the following section provides a summary of the issues, concerns, and/or questions raised. The comments and questions are organized to reflect the structure of the SA/DEIS, and are listed for review as follows:

Purpose and Need

- The purpose and need statements should not be narrowly defined to rule out feasible alternatives
- The project should be discussed in the context of the larger energy market; identify potential purchasers of the power produced; discuss how the Project will assist in meeting its renewable energy portfolio standards and goals
- The purpose and need statements must address the true nature of the Project without simply adopting the applicant's purpose

Project Description

- What utility company is partnering with this project?
- What will the natural gas line be used for?

Air Resources (Airsheds)

- Greenhouse gas emissions/climate change impacts on plants, wildlife, and habitat
- Planning for species adaptation due to climate change
- Discussion of how projected impacts could be exacerbated by climate change
- Quantify and disclose anticipated climate change benefits of solar energy
- Discussion of trenching/grading/filling and effects on carbon sequestration of the natural desert
- Discussion of ambient air conditions, NAAQS, and criteria pollutant nonattainment areas in all areas considered for solar development
- Estimation of emissions of criteria pollutants
- Description and estimation of emissions from potential construction activities
- Specify the emission sources by pollutant from mobile sources, stationary sources, and ground disturbance

- Discuss the need for an Equipment Emissions Mitigation Plan
- Discuss the need for Fugitive Dust Control Plan

Soils Resources

- Impacts to desert soils
- Increased siltation during flooding and dust
- Impacts to crypto-biotic crust
- Preparation of a drainage, erosion, and sediment control plan

Water Resources (Surface and Groundwater)

- Discuss the amount of water needed for the proposed Project, where this water will be obtained, and the amount and source of power that would be needed to move the water to the facility
- Identify impacts to jurisdictional waters of the US and California
- Effects of additional groundwater pumping in conjunction with other groundwater issues
- Impacts to groundwater, surface water, and wetlands
- Effects of diversion of water from ephemeral streams
- Water supply impacts related to dust control, fire prevention and containment, vegetation management, sanitation, equipment maintenance, construction, and human consumption
- Description of water conservation measures to reduce water demands
- Effects of climate change on water supply
- Discussion of potential effects of Project discharges on surface and groundwater quality
- Disposal of wastewater or other fluids
- Determination if Project requires a Section 404 permit under the Clean Water Act (CWA)
- Description of natural drainage patterns, Project operations, identify whether any component of Project is within 50 or 100-year floodplain
- Provide information on CWA Section 303(d) impaired waters, if any, and efforts to develop and revise total maximum daily loads
- Describe of the water right permitting process and the status of water rights within the basin, including an analysis of whether water rights have been over-allocated
- Describe any water right permits that contain special conditions; measures to mitigate direct, indirect, and cumulative impacts; and provisions for monitoring and adaptive management.
- Discuss whether it would be feasible to use other sources of water

- Discuss whether it is possible to recycle the water that would be sent to the evaporation ponds
- Identify the storm design containment capacity of the evaporation ponds, explain how overflow in larger storm events will be managed, and discuss potential environmental impacts (drainage channels affected, water quality, biological resources) in the event of overflow
- Discuss whether the evaporation pond lining will adequately prevent leakage into the ground water
- Discuss how water will be purified on-site
- Discuss how dissolved solids will be handled
- Discuss how the Project will recharge ground water
- Discuss lack of rainfall in the Project area
- Discuss how soil erosion on low fill slopes and steeply graded areas could result in sedimentation of water bodies
- Discuss impacts affecting surface springs
- Analyze potential connectivity between deep, medium and shallow groundwater aquifers
- Discuss potential adverse affects on residential wells
- Analyze potential adverse impacts affecting the watershed of the Palen and McCoy Mountains

Biological Resources

- If there are threatened or endangered species present, recommend BLM consult with USFWS and prepare a Biological Opinion under Section 7 of the ESA
- Consider adopting a formal adaptive management plan
- Impacts to all known species, not just special status, should be analyzed to assure ecosystem level protection
- Maximize options to protect habitat and minimize habitat loss and fragmentation
- Impacts due to increased shade in the desert environment
- Seasonal surveys should be performed for sensitive plant and animal species
- Analyze the effects of ponded water or bioremediation areas on wildlife, particularly migratory waterfowl
- Acquisition of lands for conservation should be part of mitigation strategy
- Impacts regarding habitat fragmentation and loss of connectivity
- Discuss the biological value of brackish groundwater and the Project's associated impacts
- Analyze potential harm to the Ford Dry Lake ecosystem (vernal pools that provide rare and endemic plants and fairy shrimp populations)

- Include surveys to account for unidentified plant species that have not yet been discovered
- Analyze impacts affecting the Palen-McCoy wilderness area and the Multiple Species Wildlife Habitat Management Plan
- Consider that the linear footprint of the Project poses a greater threat to wildlife movement (wildlife corridors) than would a more compact polygon
- Consider scientific studies pertaining to wildlife corridors and habitat linkages in the California deserts
- Identify and quantify critical habitat that might be directly, indirectly, or cumulatively affected by each alternative
- Analysis of impact and mitigation on covered species should include:
  - Baseline conditions of habitats and populations of the coved species
  - A clear description of how avoidance, mitigation and conservation measures will protect and encourage the recovery of the cove species and their habitats in the Project area
  - Monitoring, reporting and adaptive management efforts to ensure species and habitat conservation effectiveness
- Identify potential impacts of construction, installation, operation, and maintenance activities on habitat and threatened and endangered species
- Describe the condition of the land selected for the proposed Project and disclose whether the land is classified as disturbed or impaired
- Discuss the impact associated with construction fences around the Project site, and consider whether there are options that could facilitate better protection of covered species
- Discuss the effects the evaporation ponds will have on birds and wildlife
- Consider conducting biological surveys for wet years
- Discuss impacts affecting wilderness areas
- Provide detailed vegetation and wildlife maps to facilitate public input
- Discuss impacts affecting the Eastern Colorado and Northern Colorado Recovery Units
- Analyze the Project's potential to foreclose future conservation options
- Address impacts to all known species in the Desert Renewable Conservation Plan, so as to assure ecosystem level protection
- Confidentiality agreements should not be allowed for the surveys in support of the proposed Project
- Discuss effects of erosion on dune habitats

Vegetation Resources (Vegetative communities, priority and special status species)

- Identify all petitioned and listed threatened and endangered species and critical habitat that might occur within the Project area
- Include a full floral inventory of all species encountered on-site
- Seasonal surveys should be performed for sensitive plant species—lack of fall surveys may under represent onsite plants
- If transplantation is to be a part of the mitigation strategy, a detailed plan must be included as part of the EIS/SA
- Discuss impacts affecting Unusual Plant Assemblages (UPA)
- Vegetation maps should be at scale that is useful for evaluating impacts
- Impacts due to non-native invasive species
- Inclusion of an invasive plant management plan
- Assess Project impacts affecting plant taxa occurring within the Project area that are considered rare within California but more common elsewhere
- Impacts to existing plant communities

Wildlife Resources (Priority species, special status species)

- Address impacts to both individual and intergeneration movement
- Impacts to the following species:
  - Desert Tortoise
  - Burrowing owl
  - Desert bighorn sheep
  - Mojave fringe-toed lizard
  - Mule deer
  - American badger
  - Northern harrier
  - Swainson's hawk
  - Loggerhead shrike
  - Purple martin
  - Migratory birds
  - Golden eagles
  - Kit Fox
- Impacts to wildlife movement corridors
- Preserve large landscape-level migration areas

- Before passive relocation of burrowing owl is enacted, consider the location of the substitute burrows. If burrows are on site, the owls will move there and will have to be removed again

Cultural Resources

- Has a 100 percent archaeological inventory been conducted pursuant to Section 106 of the National Historic Preservation Act and BLM Manual 8100?
- Have archaeological sites been evaluated pursuant to the National Register of Historic Places criteria?
- Has consultation with Native Americans take place?
- Evaluate impacts affecting Sacred Sites
- Describe the process and outcome of government-to-government consultation between BLM and each of the tribal governments within the Project area, issues that were raised (if any), and how those issues were addressed in the selection of the proposed alternative
- Evaluate potential impacts on archeological, cultural, and historical resources in the vicinity of the Project, including, but not limited to: (1) Native American resources, burial sites, and artifacts; and (2) historical mining operations and related artifacts.
- Assuming the Project site has cultural resources, it is critical to have a “Treatment Plan” or an Historic Preservation plan
- Analyze impacts affecting the Palen Mountains, which are very sacred to the Uto-Aztecan
- Evaluate the sacredness and lack of water

Visual Resources

- Baseline for visual resources has not been categorized
- Visual impacts to wilderness areas
- Avoid impacts affecting visually sensitive areas
- Analyze the Project’s aesthetic and visual impacts that could affect tourism in the area
- The benefits which the Project will provide may well outweigh the costs of visual impacts

Land Use/Special Designations (ACECs, WAs, WSAs, etc.)

- Discuss impacts affecting Multi-Species Wildlife Habitat Management Area (WHMA)
- Evaluation of consistency with land use and regulatory plans, including Executive Order 11644, which allows for use of off-road vehicles on public lands
- Describe reasonably foreseeable future land uses and associated impacts resulting from additional power supply

- Consider direct and indirect effects of the inter-connecting transmission line
- Discuss how the Project would support or conflict with existing land use plans

Public Health and Safety

- Disclose any potentially toxic or hazardous wastes that may be associated with Project construction, operation, and maintenance including pesticides and herbicides
- Discuss how toxic wastes will be disposed
- Identify fire prevention BMPs due to use of high temperature liquids
- Discuss if bioremediation areas are to be used for soil contaminated by heat transfer fluid
- Discuss the generation of concentrated, dewatered solid waste associated with evaporation ponds and describe whether this waste product will be transported off site for disposal
- Discuss the effect the evaporation ponds will have on human safety
- Address potential direct, indirect, and cumulative impacts of hazardous waste from construction and operation of the proposed Project
- Discuss hazards that could occur in the event of an earthquake or explosion
- Address the effects that each alternative may have on wildfire risks

Noise/Vibration

- Consider wildlife as sensitive receptors

Recreation (RMAs, facilities, LTVAs, dispersed recreation opportunities, etc.)

- Evaluation should include impacts regarding off-highway vehicle use (OHV), camping, photography, hiking, wildlife viewing, and rockhounding
- Evaluation should include number of users, value of affected land for recreational purposes, and need to locate and acquire replacement venues for lands lost
- Evaluate indirect impacts caused by displacing recreational users

Social and Economic Setting

- Evaluation of economic impacts due to construction, implementation, and operation
- Economic impacts regarding loss of commerce due to recreational use losses

Environmental Justice (minority and low-income communities)

- Evaluate whether diminished recreational access would be placed disproportionately on minorities and low-income communities
- Include an evaluation of environmental justice populations within the geographic scope of the Project

Cumulative Impacts

- Identify impacts from other projects occurring in the vicinity, including solar, wind, geothermal, roads, transit, housing, ORV use, military maneuvers, and other development
- The cumulative analysis area should encompass the Sonoran/transition desert areas of the California desert at a minimum
- Some reasonably foreseeable Projects in the vicinity include all the solar and wind applications along I-10
- Identify cumulative impacts affecting wildlife and vegetation
- Include discussion of cumulative impacts to ground water supply
- In the introduction to the Cumulative Impacts Section, identify which resources are analyzed, which ones are not, and why
- Analyze the potential for development and population growth to occur in those areas that receive the generated electricity
- describe the reasonably foreseeable future land use and associated impacts that will result from the additional power supply
- Examine the potential for ecosystem fragmentation associated with the cumulative effects of large-scale industrial development occurring in the California Desert areas
- Analyze the Project's cumulative impacts affecting biological resources
- The cumulative impacts analysis should address species migration needs and other ecological processes that maybe caused by global climate change

Alternative Development and/or Alternative Design Criteria

- Project description should not be narrowly defined to rule out feasible alternatives
- Describe how each alternative was developed, how it addresses each Project objective, and how it would be implemented
- The preferred alternative should consider conjunctive use of disturbed private land in combination with adjacent lower value federal land
- Consider reduced Project size
- Alternatives should include: sites not under BLM jurisdiction; Project extent and electrical power generation that differ from proposal; use of different technology; benefits associated with the proposed technology
- Alternatives should describe rationale used to determine whether impacts of an alternative are significant or not
- Consider reconfiguration alternatives proposed by CEC in their Dec. 7, 2009 data request—to minimize impacts to wildlife movement and sensitive biological resources
- Discuss feasibility of using residential and wholesale distributed generation, in conjunction with increased energy efficiency, as an alternative

- Consider cost of energy for different technologies
- Consider large-scale rooftop photovoltaic
- Established power purchase agreements should not affect decisions made on alternatives
- Consider alternative technologies that require significantly less water
- Consider the no-action alternative
- Consider Dry Cooling as an alternative
- Consider moving the project off of all sand areas

LIBRARIES

On October 6, 2009, the Energy Commission staff sent the GSEP AFC to both the Riverside Main Library in Riverside, California, and the Palo Verde Valley District Library in Blythe, California.

In addition, to these local libraries, copies of the AFC are also available at the Energy Commission's Library in Sacramento, the California State Library in Sacramento, as well as public libraries in Eureka, Fresno, Los Angeles, San Diego, and San Francisco.

PUBLIC OUTREACH EFFORTS

Energy Commission staff provides formal notices to property owners within 1,000 feet of the proposed site and within 500 feet of a linear facility (such as transmission lines, gas lines and water lines). Staff mailed the public notices on October 6, 2009, informing the public, agencies, and elected officials of the Commission's receipt and availability of the application, 09-AFC-8. Each notice contained a link to a Commission-maintained project website (http://www.energy.ca.gov/sitingcases/GENESIS_SOLAR/index.html).

DATA REQUEST, DATA RESPONSE & ISSUES RESOLUTION WORKSHOPS

Staff from the Energy Commission and the BLM held Data Requests, Data Response and Issues Resolution Workshops in the following California communities: Blythe, Palm Desert, Palm Springs, and Sacramento. These workshops were conducted on the following days: November 23 and 24, 2009; December 10, 18 and 31, 2009; January 6, 11 and 12, 2010; and, February 10 and 18, 2010. During each of these workshops, specific time for public comment was allocated, and participation was encouraged. These workshops provided a public forum for the applicant, intervenors, staff and cooperating agencies to interact regarding project issues.

NOTIFICATION TO THE LOCAL NATIVE AMERICAN COMMUNITY

The BLM staff first sent letters to various Native American tribes regarding this project on November 26th 2007. The letter provided an initial briefing on the project and a request for any comments and concerns and was mailed to the following fourteen (14) recipients:

1. Mr. Richard Milanovich, Tribal Chair; Agua Caliente Band of Cahuilla Indians, 5401 Dinah Shore Drive, Palm Springs, CA 92264

2. Ms. Patricia Tuck, Tribal Historic Preservation Officer, Agua Caliente Band of Cahuilla Indians, 5401 Dinah Shore Drive, Palm Springs, CA 92264

3. Ms. Bridget Nash-Chrabascz, Tribal Historic Preservation Officer, Quechan Indian Tribe, Ft. Yuma Indian Reservation P.O. Box 1899, Yuma, AZ 85366-1899

4. Mr. Robert Martin, Chairman; Morongo Band of Mission Indians. 12700 Pumarra Rd. Banning, CA 92220

5. Ms. Sherry Cordova, Chair, Cocopah Tribal Council. County 15th and Ave,G. Somerton, AZ 85350

6. Mr. Eldred Enas, Chairman, Colorado River Tribal Council. 26600 Mojave Rd. Parker, AZ 85344

7. Mr. Darrell Mike, Chairman, Twenty-Nine Palms Band of Mission Indians. 46-200 Harrison Place, Coachella, CA 92236

8. Mr. John James, Chairman; Cabazon Band of Mission Indians. 84245 Indio Springs Rd. Indio, CA 92203-3499

9. Ms. Maryann Green, Chairperson, Augustine Band of Mission Indians. P.O. Box 846 Coachella, CA 92236

10. Mr. Timothy Williams, Chairman; Fort Mojave Tribal Council. 500 Merriman Ave. Needles, CA 92363

11. Mr. Charles Wood, Chairman; Chemehuevi Tribal Council. P. O. Box 1976 Havasu Lake, CA 92363.

12. Mr. Michael Jackson, Sr., President, Fort Yuma Quechan Tribe. P.O. Box 1899, Yuma, AZ 85366-1899

13. Mr. James Ramos, Chairman; San Manuel Band of Mission Indians. P.O. Box 266, Patton, CA 92369

14. Ms. Mary Resvaloso, Chairwoman; Torres-Martinez Desert Cahuilla Indians. P.O. Box 1160, Thermal, CA 92274-1160

Replies were received from the following three (3) Tribes requesting reports, expressing concerns, or referring to neighboring groups whom may have an interest in the project area.

1. Ms. Patricia Tuck, Tribal Historic Preservation Officer, Agua Caliente Band of Cahuilla Indians, 5401 Dinah Shore Drive, Palm Springs, CA 92264

2. Ms. Bridget Nash-Chrabascz, Tribal Historic Preservation Officer, Quechan Indian Tribe, Ft. Yuma Indian Reservation P.O. Box 1899, Yuma, AZ 85366-1899

3. Mr. Britt W. Wilson, Project Manager-Cultural Resources; Morongo Band of Mission Indians. 12700 Pumarra Rd. Banning, CA 92220

On February 22, 2010, the BLM sent an additional letter that provided an update on the CEC-BLM workshops that were held in December, 2009 and January and February, 2010 and on Native American input that was received. The letter invited tribes to consult on eligibility evaluations of archeological sites and invited tribes to consult on the Programmatic Agreement (PA) being prepared by BLM, the State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation (ACHP).

ENERGY COMMISSION'S PUBLIC ADVISER'S OFFICE

The Energy Commission's outreach program is also facilitated by the Public Adviser's Office (PAO). The PAO also requested public service announcements at a variety of organizations including the Blythe City Council, local newspapers, three separate Chambers of Commerce, local (Palm Springs) television and (Palm Springs and Blythe) radio stations. These notices informed the public of the Commission's receipt of the GSEP application 09-AFC-8, and invited the public to attend the Public Site Visit (to the proposed GSEP site) and Informational Hearing/BLM Scoping Meeting on December 10, 2009 in Blythe, CA.

ORGANIZATION OF THE STAFF ASSESSMENT/DRAFT ENVIRONMENTAL IMPACT STATEMENT (SA/DEIS)

The SA/DEIS contains an Executive Summary, Introduction, Project Description, and Project Alternatives. The environmental and engineering analyses of the proposed project are contained in a discussion of nineteen (19) separate technical areas.

ENVIRONMENTAL ANALYSIS

- Air Quality
- Biological Resources
- Cultural Resources and Native American Values
- Hazardous Materials Management
- Public Health and Safety
- Soil and Water Resources
- Land Use, Recreation, and Wilderness
- Noise and Vibration
- Socioeconomics and Environmental Justice
- Traffic and Transportation
- Transmission Line Safety and Nuisance
- Visual Resources
- Waste Management

- Worker Safety and Fire Protection

ENGINEERING ANALYSIS

- Facility Design
- Geology, Paleontology, and Minerals
- Power Plant Efficiency
- Power Plant Reliability
- Transmission System Engineering

Each technical area is addressed in a separate chapter. These chapters are followed by a discussion of alternatives, facility closure, project construction and operation compliance monitoring plans. Among other things, each technical area assessment will include a discussion of:

- laws, ordinances, regulations, and standards (LORS);
- the regional and site-specific setting;
- project specific and cumulative impacts;
- mitigation measures;
- closure requirements;
- conclusions and recommendations; and
- conditions of certification for both construction and operation

Cumulative Impacts

An understanding of potential cumulative impacts is important, particularly in light of the recent and rapid development of proposed renewable energy projects in the southeast region of California and the BLM California Desert District. Historically, the desert has seen little change or human development largely due to the adverse climatic conditions. The introduction of large utility scale solar facilities will reduce the amount of previously undisturbed desert area. The intensity of the proposed development at this time depends on actual development; however, many proposed projects are undergoing environmental review.

Federal and State of California regulations guide the analysis of cumulative impacts as part of environmental review under the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). At the Federal level, the Council of Environmental Quality regulations for implementing NEPA define cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 Code of Federal Regulations [CFR] Section 1508.7).

California state regulations have adopted similar language to define cumulative impacts as “the change in the environment which results from the incremental impact” of the Genesis Solar Energy Project (the Project) when “added to other closely related past, present, and reasonably foreseeable probable future projects.” Cumulative impacts can result from “individually minor but collectively significant projects taking place over a period of time” (California Code of Regulations, Title 14 Division 6, Chapter 3, Section 15355).

This overview of the past, present, and reasonably foreseeable future projects provides the data for the cumulative impacts analysis of each environmental resource evaluated in the AFC. Factors that have been considered in developing the past, present, and reasonably foreseeable scenarios include Federal and State goals for renewable energy development; long-term transmission plans; local land use planning documents; and applications filed with Federal, State, and local agencies, including the Bureau of Land Management (BLM), the CEC, and Riverside County.

Affected Environment

The BLM has developed “Guidance for Processing Applications for Solar Power Generation Facilities on Bureau of Land Management Administered Public Lands in the California Desert District” (2008). The BLM guidance states “the reasonably foreseeable development scenario should be developed using an ‘areawide’ approach selected specifically for the individual project and surrounding area. The appropriate land area to cover in analyzing cumulative impacts may vary by resource.” The BLM California Desert District, Palm Springs-South Coast Field Office, the Federal lead agency on the Project, provided the area to consider for the cumulative impact analysis for the Project.

Environmental Setting, Past and Present Actions

The Project area is located in eastern Riverside County, where land use is characterized predominantly by open space and conservation and wilderness areas. The western portion of the county accounts for most of the developed area of the county, including urban areas and agricultural areas. The southeastern corner of the county to the east of the Project also contains agricultural areas and limited rural development (Riverside County, 2003).

The Riverside County General Plan divides areas of the county into regional planning areas (Riverside County, 2003). The Project is located within the Eastern Riverside County Desert Areas (Non-Area Plan), which encompasses lands in the eastern portion of the county not located within a specific area plan. The General Plan land use policy is to “preserve the character of the Eastern Riverside County Desert Area” (Riverside County, 2003).

The area designated within the Palo Verde Valley Area Plan occurs to the east of the Project and encompasses the developed and agricultural area in eastern Riverside County. The portion of the Palo Verde Valley Area Plan in the vicinity of the Project consists mainly of sparsely populated desert and mountain areas. The more populated and agricultural areas occur farther east of the Project in the vicinity of Blythe.

The Project is also located within the BLM California Desert Conservation Area Resource Management Plan (CDCA Plan) (BLM, 1980). The CDCA Plan establishes a number of conservation areas under the Wilderness Review Program. The Project is located adjacent to the southern boundary of the Palen/McCoy Wilderness Area. The Chuckwalla Mountains and Little Chuckwalla Mountains Wilderness Areas are also located farther south-southwest of the Project.

Reasonably Foreseeable Future Actions

The State of California has issued a number of executive and legislative measures that have created a need in California for the development of solar and other renewable energy sources. The California Renewables Portfolio Standard (RPS) currently calls for the State's utilities to procure 20 percent of their retail electricity sales from renewable energy by 2010, as specified in Senate Bill 107, passed in 2006 and effective as of January 1, 2007.

The current RPS represents a more aggressive goal from the original RPS goal of 20 percent by 2017, originally established by Senate Bill 1078 in 2002. Governor Schwarzenegger's Executive Order of November 2008 (S-14-08) and California Energy Action Plan (2005) have also set the goal at 33 percent by 2020.

In response to the growing demand for renewable energy sources in California, the BLM and the CEC have received applications for the development of solar and other renewable energy facilities throughout California. Several planning initiatives have been established to programmatically review California's natural and social resources and identify areas most suitable for development of renewable energy resources. For the purposes of the cumulative impacts discussion, the proposed projects and public planning initiatives are considered present and reasonably foreseeable future actions that are included in the cumulative impacts analysis.

B. DESCRIPTION OF THE PROPOSED PROJECT AND ALTERNATIVES

B.1 - DESCRIPTION OF PROPOSED PROJECT AND ALTERNATIVES

Mike Monasmith and Susan V. Lee

B.1 PROPOSED PROJECT

B.1.1 INTRODUCTION

On August 31, 2009, the California Energy Commission received an Application For Certification (AFC) from the applicant Genesis Solar, LLC to construct and operate the Genesis Solar Energy Project (GESP) in eastern Riverside County, approximately 25 miles west of the Arizona-California border city of Blythe, California. Following the augmentation of the AFC with additional data and information in Supplements, the AFC was deemed complete by the Energy Commission on November 4, 2009, beginning staff's analysis of the proposed project.

This section provides a description of the proposed project and three (3) project alternatives being considered by the Energy Commission and the U.S. Bureau of Land Management (BLM). Under NEPA, both the proposed project ***and*** the three project alternatives are all considered alternatives to each other. The alternatives range in size from 850 acres up to 1,800 acres.

Two of the three project alternatives being described herein are the same size. The remaining alternative is a significantly smaller version of the proposed project (approximately 50 percent smaller). This smaller alternative is being considered because of its ability to avoid environmental impacts to groundwater resources (the impetus behind the "dry cooling" alternative as well).

All three of the project alternatives would use the same solar electric technology and therefore have a common description of equipment, systems, processes, resource inputs, operations, closure plans and general location. As such, in order to avoid redundancy, this section will present a single project description that identifies the elements that are common to each alternative and then separately identify the elements that are unique to each alternative.

B.1.2 DESCRIPTION

The Genesis Solar Energy Project at the Ford Dry Lake site is proposed for development in the Sonoran Desert approximately 25 miles west of Blythe, California. The total area in the BLM ROW application is 4,640 acres. The actual proposed facility would be located on approximately 1,800 acres. Surrounding land uses include the McCoy Mountains to the east, the Palen Mountains (including the Palen Mountains Wilderness Area) to the north, and the Blythe Airport about 15 miles to the east. Interstate 10 (I-10) is located about 2 miles south of the southernmost border of the proposed ROW area.

The project will require two separate units consisting of a total of 1,760 solar collector assemblies (SCAs) arrayed in rows, or piping loops, with four assemblies in each loop.

Each SCA will consist of individually mounted mirror modules approximately 40 feet long, for a total length of 492 feet with an approximate mirror area of 8,795 square feet. The mirrors to be used for the project will have an aperture of 18.9 feet and focal length of 5.6 feet.

The overall site layout and generalized land uses are characterized as follows:

- 250-MW facility, including solar generation facilities, on-site substation, administration, operations and maintenance facilities: approximately 1,800 acres;
- Evaporation ponds: up to 50 acres (located within the 1,800-acre site);
- Surface water control facilities for storm water flow and discharge; and
- Temporary construction laydown area(s) will be accommodated within the larger site footprint. No additional laydown areas outside the eventual project footprint are contemplated.

The following sections describe the site arrangement and the processes, systems, and equipment that constitute the generation facilities. All plant facilities will be designed, constructed and operated in accordance with applicable laws, ordinances, regulations and standards (LORS). All generating facilities would be located within the fence line of each of the alternative projects. **Project Description Figure 1** illustrates the regional setting for the proposed project. Project related, linear facilities (approximately 6.5 miles in length) located outside the project fence line are limited to a new 230-kV transmission line, access road, and the 8-inch natural gas pipeline, and can be viewed in **Project Description Figure 2**.

Major Facilities and Site Arrangement

Overall project facilities include the following major components:

- Solar field(s);
- Power block;
- Access road from I-10 (Wiley Wells exit) to onsite office;
- Office and parking;
- LTU (Land Treatment Unit) for bioremediation of HTF-contaminated soil;
- Maintenance buildings and laydown area; and,
- Onsite transmission facilities including switchyard.

Each 125 MW power plant (one for the eastern solar field, and one for the western solar field) consists of:

- STG (Steam Turbine Generator);
- SSG (Servicing Scenario Generator) heat exchangers;
- Surface condenser;
- Feedwater pumps;
- Deaerator

- Feedwater heaters
- Wet cooling tower
- Evaporation ponds
- Natural gas-fired boilers
- Solar thermal collection field

The plant's power cycle is the Rankine-with-reheat thermodynamic cycle. A preliminary heat balance diagram for the process is included in Figure 3.4-6. The thermal input is via heated HTF from the parabolic trough solar field at a temperature of approximately 740F.

Overall annual availability for each 125 MW facility is expected to be between 96 to 98 percent of possible operating hours (between 3,000 and 3,200 hours per year). Each plant's capacity factor will depend on the local solar insolation, but has been estimated to be approximately 27 percent, or approximately 300,000 MWh/year. Each 125 MW plant will use the Rankine thermodynamic cycle with reheat described as follows:

Process 1: The working fluid (water) is pumped from low to high pressure. During this process, steam extracted from the STG is used to preheat the water prior to entering the SSG system, which increases overall cycle efficiency.

Process 2: The high pressure liquid enters the SSG system where it is heated theoretically at constant pressure by the HTF to become superheated steam.

Process 3: The superheated steam expands through the high pressure section of the steam turbine, turning the generator to produce electricity. This steam is then reheated in different vessels that are part of the SSG system and sent to the reheat section of the steam turbine. The reheat exhausts into the low pressure (LP) section of the steam turbine.

Process 4: The wet steam from the LP section then enters the surface condenser where it is cooled at a constant low pressure to become a saturated liquid. The condensed liquid returns to Process 1.

As the HTF is circulated from the SSG to the solar field, it absorbs solar energy and provides a high temperature (740^{o}F) energy source for the Rankine cycle. Waste heat is rejected in Process 4. As the turbine exhaust is condensed, the heat is transferred to the cool circulating water. The warm circulating water carries the heat to the wet cooling tower to be rejected.

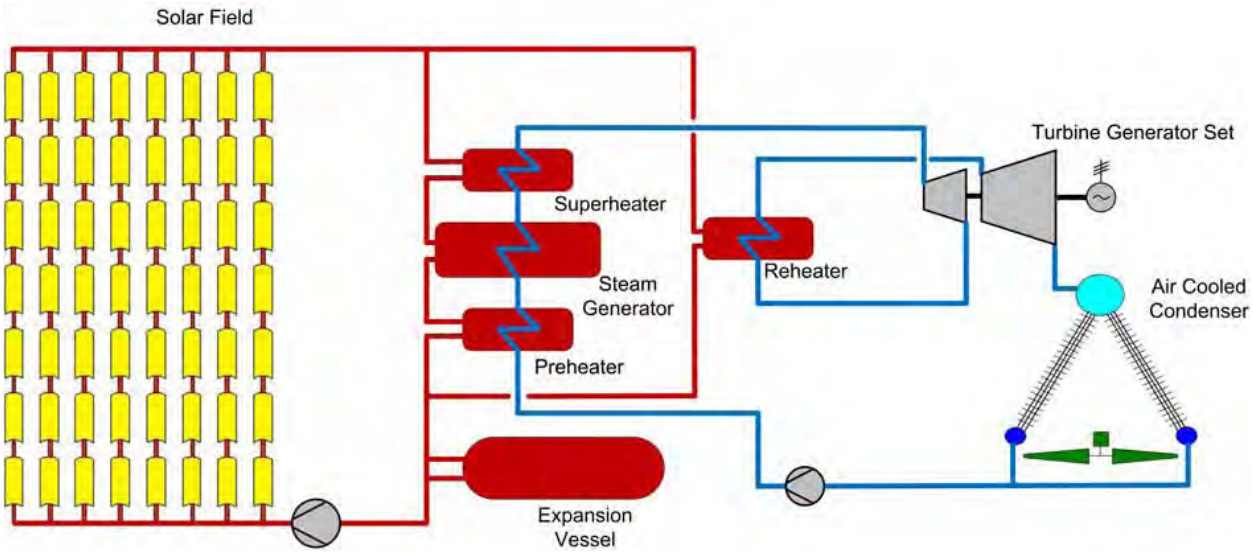
Power Generation Process

The power generating facility is composed of the following major components:

- Deaerator,
- Feedwater pumps,
- Feedwater heaters,
- SSG,

- Steam superheater,
- Steam reheater,
- STG,
- ACC,
- Between 850 acres and approximately 1,700 acres of parabolic trough solar collection fields, and HTF piping, pumping, and conditioning system – depending on which alternative is approved.

The thermodynamic cycle is illustrated in the diagram below and described in the steps that follow:



Red lines on the diagram represent HTF piping. Hot HTF flows from top to bottom in the figure, arriving from the solar fields (having captured the sun's energy) and transferring this heat from the sun to the superheater and reheater; from where it then moves the heat energy to the steam generator; and, lastly the HTF flows to the preheater before returning to the solar fields to be heated once again in a continual cycle of renewable, clean energy. The blue lines represent steam and water piping. Feedwater, the portion of the blue line between the ACC and the preheater, is heated in a series of feedwater heaters by steam turbine extractions at various pressure levels.

Solar Energy Conversion Facilities Description

This section describes the major energy conversion components of the Project, including the solar collection system, SSG, STG, auxiliary boilers, and HTF freeze protection heat exchanger. The Project will consist of two, single-unit parabolic trough solar fields (125 MW each) that feed a single power plant having a combined, nominal output of 250 MW. The plant will consist of a conventional steam Rankine-cycle power block, two parabolic trough solar fields, an HTF and steam generation system, as well as a variety of ancillary facilities, such as conventional water treatment, electrical switchgear, administration, warehouse, and maintenance facilities.

Individual Components of the Proposed Project

Solar Collector Assemblies - The project's SCAs are oriented north-south to rotate east-west to track the sun as it moves across the sky throughout the day. The SCAs collect heat by means of linear troughs of parabolic reflectors, which focus sunlight onto a straight line of heat collection elements (HCEs) welded along the focus of the parabolic "trough".

Heat Transfer Fluid - Therminol™ (VP-1), an aromatic hydrocarbon, biphenyl-diphenyl oxide manufactured by Solutia, is currently being considered as the HTF for the Project. Therminol is a special high-temperature oil that has an excellent operating history and is used in many heat transfer processes. Dowtherm A, an essentially chemically identical product manufactured by Dow, is being considered as an alternative to Therminol™ (VP-1).

Parabolic Trough Collector Loop - Each of the collector loops consist of two adjacent rows of SCAs, each row is about 1,300 feet long. The two rows are connected by a crossover pipe. HTF is heated in the loop and enters the header, which returns hot HTF from all loops to the power block where the power generating equipment is located.

Mirrors - Low-iron glass mirrors are mounted on the SCA. These mirrors are reliable components that have shown no long-term degradation in reflective quality. Twenty-year-old mirrors can be cleaned and brought back to like-new reflectivity. Long-term endurance of the mirror, as measured by the experience at Solar Electric Generating Station (SEGS), indicates mirror life of 30 years or more can be expected for the Project. Flexible mirror reflectivity monitoring procedures using demineralized water for mirror washing is critical. The periodic monitoring of mirror reflectivity provides a valuable quality control tool for mirror washing and helps to optimize wash labor.

Solar Steam Generator System - The SSG system design is similar to any "kettle boiler" shell and tube heat exchanger in that the hot HTF is circulated through tubes and the steam is produced on the shell side. The SSG system includes heat exchangers for preheating the condensate, superheating the steam, and reheating steam, in addition to the boiler vessels.

HTF Freeze Protection Heat Exchanger - The HTF freezes at temperatures below 54 °F. To eliminate the problem of HTF freezing, steam-fed shell and tube heat exchangers will be used to keep the HTF above 100 °F whenever the facility is offline. As discussed above, the auxiliary boilers will supply the heat for this process as well as performing the function of a startup boiler. This dual-use configuration reduces the number of individual emission sources.

HTF Expansion Tank - Expansion tanks are required to accommodate the volumetric change that occurs when heating the HTF to the operating temperature. Nitrogen will be used to blanket the headspace of the tanks. The nitrogen purge prevents oxidation or contamination of the HTF by reducing its exposure to atmospheric air.

HTF Ullage/Flash System - During plant operation, HTF will degrade into components of high and low boilers (substances with boiling points higher and lower than the HTF). The low boilers are removed from the process as vapors through the ullage system. The high boilers are removed from the process as liquid and sediment through the HTF flash system.

Auxiliary Boiler - The auxiliary boiler will be fueled by natural gas and will provide steam for maintaining steam cycle equipment vacuum over night and for startup. Sealing steam is used to prevent air from entering the steam turbine while the condenser is under vacuum. This method reduces startup time for the plant compared to relying on solar-generated steam as the sealing steam source. Unlike a gas-fired power plant, a solar thermal plant must wait for the sun to rise in the morning to start generating steam and has a finite time to generate electricity (i.e., the number of sunlight hours). If the plant does not have a secondary source of steam, plant startup is delayed (and thus total daily electrical generation reduced), while solar heat alone generates sealing steam and vacuum is established in the condenser. Once the plant begins generating electricity for delivery to the electrical grid, the fired auxiliary boiler is no longer needed and is held in stand-by mode until auxiliary heat is again required after plant shutdown. The maximum estimated natural gas usage for the auxiliary boiler is expected to be 60 million standard cubic feet per year, for a maximum of 60,000 British thermal units per year.

Major Electrical Systems and Equipment

This section describes the major electrical systems and equipment. Roughly 10 percent of the STG output will be used on-site for plant auxiliary loads such as motors, heaters, control systems, and general facility loads including lighting and heating, ventilation, and air conditioning (HVAC). Some of the power needed for on-site uses will be converted

Power will be generated by the STG (size and generation voltage is depending on the final generator selection) and stepped up by a fan-cooled generator step-up transformer (GSUT). Start-up power will be back-fed through the GSUT. Once the STG is running, it will supply the plant auxiliary power through a generator bus tap and the unit auxiliary transformer (UAT). The plant stand-by electrical power requirements will be back-fed through the GSUT and UAT. There will also be an alternate back-feed power source to the main auxiliary switchgear. This will be key-interlocked with the main auxiliary power source to prevent both sources from operating simultaneously.

Grounding - The electrical system is susceptible to ground faults, lightning, and switching surges that can pose hazards to site personnel and electrical equipment. The station grounding system provides an adequate path to ground to permit the dissipation of current created by these events. The station ground grid will be designed for adequate capacity to dissipate ground current.

Bare conductors will be installed below-grade in a grid pattern throughout the power block area. Each junction of the grid will be bonded together by an exothermic weld or compression connection. Ground resistivity readings will be used to determine the necessary numbers of ground rods and grid spacing to ensure safe step and touch potentials under severe fault conditions. Grounding stingers will be brought from the

ground grid to connect to building steel and non-energized metallic parts of electrical equipment.

Electrical Generation - As shown in the key one line diagram, Figure 3.4-7, the Project's STGs will tie into a 230 kV on-site switchyard. The STGs generate electricity at 13.8 kV that will connect to the switchyard at 230 kV via a generator circuit breaker (GCB) and a GSUT. The GCB will be rated at 8000 Amperes (A) and will include 8000/5 A current transformers and 14.4-0.12 kV voltage transformers for generator bus duct and UAT protection. A disconnect switch will be included with the generator circuit breaker for generator disconnect and transformer maintenance. An 8000 A isolated phase bus duct will connect the generator to the GCB and the GCB to the GSUT. The GSUTs will be 150 megavolt-amps (MVA), 230-13.8 kV, two-winding, delta-wye grounded, and fan-cooled (using oil-immersed natural circulation, multi-stage, forced air cooling). The neutral point of high-voltage winding will be solidly grounded. The main step-up transformer will have metal oxide surge arrestors connected to the high-voltage terminals and will have manual de-energized ("no-load") tap changers located in high-voltage windings to allow for a nominal voltage plus or minus five percent with a 2.5 percent differential to allow for generator output voltage variations. The GSUT will rest on a concrete pad with a perimeter berm designed to contain the transformer non-polychlorinated biphenyl (PCB) insulating oil in the event of a leak or spill.

The plant site switchyard will be located near the unit two power blocks, as shown in Figure 3.4-3, and will require an overhead 795 thousand circular mils (kcmil) size, steel-reinforced, aluminum conductor unit tie line for the connection to both unit's GSUTs. The switchyard will consist of 230 kV switchyard circuit breakers with 230 kV, 1200 A disconnect switches on each side of the breaker for breaker maintenance. The switchyard breakers will be of the dead tank design with 1200/5 multi-ratio current transformers on each bushing and 230-0.12 kV coupling capacitor voltage transformers located near the breaker control cabinet for protection of the gen-tie line during normal operation of the GSUT and the UAT during back-feed. The switchyard breakers will also be coordinated with the GCBs and 4.16 kV station service switchgear main breakers for bus duct, GSUT, UAT, and unit tie line protection and will also be used for generator synchronizing.

A disconnect switch will be located at the gen-tie line termination within the switchyard for line isolation. The switchyard will be equipped with metering accuracy instrument transformers. Lightning arresters will be provided in the area of the takeoff towers to protect against surges due to lightning strikes. Tubular aluminum alloy bus will be used in the switchyard. Cable connections between the tube bus and equipment will be aluminum or aluminum alloy type cable. Electrical faults will be detected, isolated, and cleared in a safe and coordinated manner as soon as practical to ensure the safety of equipment, personnel, and the public. Protective relaying will meet Institute of Electrical and Electronic Engineers (IEEE) requirements and will be coordinated with the utility.

Fuel Supply and Use - As shown in Figure 3.4-1 and discussed in Section 3.4, the auxiliary boilers will be fueled by natural gas supplied from a new six-mile, eight-inch pipeline connected to an existing Southern California Edison (SCE) pipeline located north of I-10. Natural gas delivered to the Project site will flow through a revenue quality flow meter, pressure regulation station, and filtering equipment, and will provide gas to

the auxiliary boilers for each 125 MW power plant. Safety pressure relief valves are provided downstream of the pressure regulation valves. The estimated natural gas usage for each auxiliary boiler is 30 million British thermal units per hour (MMBtu/hr) or a total of 60 MMBtu/hr for the Project. The maximum annual natural gas usage is expected to be 60 million standard cubic feet per year (MMSCF/yr) for a maximum of 60,000 MMBtu/year. Table 3.4-1 shows the typical composition of the natural gas used to fuel the Project's auxiliary boilers.

Water Supply and Consumptive Requirements - The Project's various water uses include makeup for the circulating water system, makeup for the SSG, water for solar collector mirror washing, service water, potable water, and fire protection water.

Water Treatment - The raw water, circulating water, process water, and mirror washing water all require on-site treatment and this treatment varies according to the quality required for each of these uses. The power plant's design consists of a pre-treatment system upstream of the cooling tower, and a post-treatment system downstream of the cooling tower.

Water is cycled in the cooling tower until the concentration of chemical constituents rises to levels where it becomes unusable and it is blown down as a waste stream. The number of cycles undertaken are called cycles of concentration (COC). The number of COCs in the cooling tower is limited by the incoming water chemistry and the behavior of chemistry constituents as the concentration increases. Without any pre-treatment of the raw water ("makeup water") from groundwater on site, the calcium concentration would limit the process to about five COCs due to the potential to form calcium carbonate ($CaCO_3$) scale, and silica would limit the process to 10 COCs due to the formation of silica (SiO_2) and magnesium silicate scale. Because of the limitation of these constituents in the process, pre-treatment of the makeup water is desirable to reduce the quantity of makeup water required. The pre-treatment design for the Project takes into account the relatively high concentrations of chloride and sodium present in the makeup water to the site. As aforementioned, there are several tanks on site which will contain the raw water, treated water, and wastewater, which will have the following capacity:

- Raw Water/Fire Water Storage Tank: 500,000 gallons
- Treated Water Storage Tank: 1,250,000 gallons
- Wastewater Storage Tank: 250,000 gallons

Tanks were sized to provide sufficient water to support operation of the plant during peak operating conditions, as well as provide a 12-hour storage capacity to enable continued operation when a failure interrupts water or wastewater treatment capabilities. The tanks also allow the plant to levelize water supply requirements on a 24-hour basis and eliminate midday demand peaks. The Raw Water/Fire Water Storage Tank provides water for plant operation and fire protection, as discussed in the **Worker Safety** section of this document.

Water Source and Quality – Project water for Genesis will come from pumping groundwater from wells to be installed at the Project site. These wells will pump groundwater from the Bouse Formation and/or underlying Fanglomerate within the Chuckwalla Valley Groundwater Basin. The characteristics and yield of the aquifer that is proposed for the Project water supply, and the long-term effect of pumping of the groundwater system, are discussed in more detail in the **Soil and Water Resources** section of this document.

Steam Cycle Process Water - Makeup water for the steam cycle must meet stringent specifications for suspended and dissolved solids. To meet these specifications, water from the treated water storage tank is sent to a DI makeup water tank, and then processed through a demineralized water makeup system consisting of mixed-bed demineralizers and a 40,000 gallon demineralized water storage tank. Water produced by this system will also be used for the mirror washing described below. Additional conditioning of the condensate and feedwater circulating in the steam cycle is provided by means of a chemical feed system. To minimize corrosion, an oxygen scavenger for dissolved oxygen control, and an alkaline solution for pH control, are fed into the condensate. To minimize scale formation in the SSG, a solution of disodium phosphate (DSP) and tri-sodium phosphate (TSP) may be fed into each feedwater system. The chemical feed systems include an oxygen scavenger feed tank, an alkaline solution (amine) feed tank, and a phosphate solution feed tank. The feed tanks are provided with two full-capacity metering pumps.

A steam cycle sampling and analysis system monitors the water quality at various points in the plant's steam cycle. The water quality data are used to guide adjustments in water treatment processes and determine the need for other corrective operational or maintenance measures. Steam and water samples are routed to a sample panel where steam samples are condensed and the pressure and temperature of all samples are reduced as necessary. The samples are then directed to automatic analyzers for continuous monitoring of conductivity and pH. All monitored values are indicated at the sample panel and critical values are transmitted to the plant control room. Grab samples are periodically obtained at the sample panel for chemical analyses that provide information on a range of water quality parameters.

Solar Mirror Washing Water - To facilitate dust and contaminant removal, deionized (demineralized) water from the demineralized water storage tank is used to spray clean the solar mirrors on a periodic basis, determined by the reflectivity monitoring program. This operation is generally done at night and involves a water truck spraying deionized water on the mirrors in a drive-by fashion. The deionized water production facilities, already in place for SSG makeup water, will be sized to accommodate the additional solar mirror washing demand of about two acre-feet per year and is shown on the water balance diagrams. Water from the washing operation is expected to mostly evaporate on the mirror surface with no appreciable runoff.

Cooling Systems - Each power plant includes two cooling systems: 1) the steam cycle heat rejection system (*e.g.,* cooling tower); and 2) the closed cooling water system (equipment cooling), each of which is discussed below.

Steam Cycle Heat Rejection System - The cooling system for heat rejection from the steam cycle consists of a surface condenser, circulating water system, and wet cooling tower. The surface condenser receives exhaust steam from the LP section of the STG and condenses it to liquid for return to the SSG. The surface condenser is a shell-and-tube heat exchanger with wet, saturated steam condensing on the shell side and circulating water flowing through the tubes to provide cooling. The warmed circulating water exits the condenser and flows to the cooling tower to be cooled and reused.

The circulating water is distributed among multiple cells of the cooling tower, where it cascades downward through each cell and then collects in the cooling tower basin. The mechanical draft cooling tower employs electric motor-driven fans to move air through each cooling tower cell. The cascading circulating water is partially evaporated, and the evaporated water is dispersed to the atmosphere as part of the moist air leaving each cooling tower cell. As discussed in Section 5.10, Visual Resources, because of climatic conditions at the site, visible moisture plumes are expected to occur relatively infrequently and largely in winter months, and no need is expected for a plume-abated cooling tower.

The circulating water is cooled primarily through partial evaporation and secondarily through heat transfer with the air. The cooled circulating water is pumped from the cooling tower basin back to the surface condenser and auxiliary cooling water system.

Auxiliary Cooling Water System - The auxiliary cooling water system uses water from the cooling tower for the purpose of cooling equipment including the STG lubrication oil cooler, the STG generator cooler, steam cycle sample coolers, large pumps, etc. The water picks up heat from the various equipment items being cooled and rejects the heat to the cooling tower.

Waste Management - Project wastes include wastewater, non-hazardous solid waste, hazardous solid waste, and hazardous liquid waste. Project waste streams and management details are discussed in Section 5.4, Water Resources and Section 5.13, Waste Management.

Wastewater - Wastewater would be segregated into two separate collection systems, one for industrial streams and one for sanitary wastes. Industrial wastewater from both the pre-treatment and post-treatment systems will be piped to three 8-acre evaporation ponds for disposal. The evaporation ponds make up a total combined area of 24 acres for each 125 MW unit (48 acres of pond for both 125 MW units). There are three primary and one occasional waste streams discharging into the evaporation ponds:

- Pre-cooling tower water treatment MMF waste stream
- Post-cooling tower water treatment MMF waste stream
- Post-cooling tower water treatment
- 2nd stage Reversed Osmosis (RO) waste stream

Occasionally, storm water may accumulate in the proposed Land Treatment Unit (LTU) that will be used to treat soil affected by spills of HTF, and will be transferred to the evaporative ponds.

On an annual average, blowdown to the evaporation ponds will be approximately 90,000 gallons per day for each unit, increasing to approximately 140,000 gallons per day for each unit during peak summer conditions. The Project's sanitary system will collect wastewater from sanitary facilities such as sinks and toilets. This waste stream will be sent to an on-site sanitary waste septic system designed and permitted in accordance with Riverside County Department of Health Services standards.

Evaporation Ponds - As noted above, it is expected each 125 MW unit will have three double-lined evaporation ponds. Each pond will have a nominal surface area of eight acres resulting in a total of 24 acres of evaporation ponds for each unit or a total of 48 acres of ponds for both 125 MW units. The ponds will be designed and permitted as Class II Surface Impoundments in accordance with Colorado River Regional Water Quality Control Board (CRRWQCB) requirements, as well as the requirements of the California Integrated Waste Management Board (CIWMB). Multiple ponds are planned to allow plant operations to continue in the event a pond needs to be taken out of service for some reason, *e.g.,* needed maintenance. Each pond will have enough surface area so the evaporation rate exceeds the cooling tower blowdown rate at maximum design conditions and annual average conditions
.
The average pond depth is eight feet and residual precipitated solids will be removed approximately every seven years to maintain a solids depth no greater than approximately three feet for operational and safety purposes. The precipitated solids will be sampled and analyzed to meet the characterization requirements of the receiving disposal facility.

On-site Bioremediation Land Treatment Unit - The Project will include a bioremediation LTU to treat soil impacted by incidental spills and leaks of HTF at various concentrations. The unit will be designed and permitted as a Class II LTU in accordance with CRRWQCB and CIWMB requirements. The LTU will cover an area of approximately 600 feet by 725 feet, including the staging area, and will cater for both 125 MW units. The LTU will be constructed with a prepared base consisting of two feet of compacted, low permeability, lime treated material and be surrounded on all sides by a minimum two foot high compacted earthen berm with slopes of approximately 3:1 (horizontal:vertical). Based on available operation data from other sites, it is anticipated approximately 750 cubic yards (on average) of HTF-affected soil may be treated per year. Larger or smaller quantities could be generated during some years, depending on the frequency and size of leaks and spills.

Other Non-Hazardous Solid Waste - Construction, operation, and maintenance of the Project will generate non-hazardous solid wastes typical of power generation or other industrial facilities (see Section 5.13, Waste Management). These wastes include scrap metal and plastic, insulation material, paper, glass, empty containers, and other miscellaneous solid wastes. These materials will be disposed by means of contracted refuse collection and recycling services.

Hazardous Solid and Liquid Waste - Small quantities of hazardous wastes will be generated during Project construction and operation. Hazardous wastes generated during the construction phase will include substances such as paint and primer, thinners, and solvents. Hazardous solid and liquid waste streams generated during

Project operations include substances such as used hydraulic fluids, oils, greases, filters, etc., as well as spent cleaning solutions and spent batteries. To the extent possible, both construction and operation-phase hazardous wastes will be recycled. Tables 5.13-2 (construction phase) and 5.13-3 (operations phase) in Section 5.13, Waste Management, summarize Project hazardous waste streams in terms of quantities, origin and composition, and management method(s).

Hazardous Material Management - There will be a variety of hazardous materials used and stored during construction and operation of the Project. The **Hazardous Materials Management** section of the SA/DEIS provides additional data on the hazardous materials that will be used during construction and operation, including quantities, associated hazards and permissible exposure limits, storage methods, and special handling precautions. Hazardous materials that will be used during construction include gasoline, diesel fuel, oil, lubricants, and small quantities of solvents and paints. All hazardous materials used during construction and operation will be stored on site in storage tanks, vessels and containers that are specifically designed for the characteristics of the materials to be stored; as appropriate, the storage facilities will include the needed secondary containment in case of tank/vessel failure.

Engineering Controls - Engineering controls help to prevent accidents and releases (spills) from moving off site and affecting communities by incorporating engineering safety design criteria in the design of the project. The engineered safety features proposed by the applicant for use at the GSEP project include:

- storage of small quantity hazardous materials in original, properly labeled containers;
- construction of secondary containment areas surrounding each of the bulk hazardous materials storage areas, designed to contain accidental releases that might happen during storage or delivery plus the volume of rainfall associated with a 25-year, 24-hour storm;
- physical separation of stored chemicals in isolated containment areas in order to prevent accidental mixing of incompatible materials, which could result in the evolution and release of toxic gases or fumes;
- installation of a fire protection system for hazardous materials storage areas; and
- continuous monitoring of HTF piping system by plant staff and by automatic pressure sensors designed to trigger isolation valves if a leak is detected.

Air Emissions Control and Monitoring - Installation and operation of the Project will result in a change in the emissions signature for the site. Criteria pollutant emissions from the proposed auxiliary boilers, fire pump engines, emergency generator engines, and cooling towers are discussed in the **Air Quality** and **Public Health** section of this analysis. Operation of the Project will result in emissions to the atmosphere of both criteria and toxic air pollutants from the proposed auxiliary boilers, fire pump engines, emergency generator engines, and cooling towers, and fugitive losses from the HTF system. Construction-related emissions are associated with site disturbance resulting from site preparation and with the typical emissions and associated construction-related activities encountered at any construction site.

Fire Protection - Fire protection systems are provided to limit personnel injury, property loss, and Project downtime resulting from a fire. The systems include a fire protection water system and portable fire extinguishers.

Each 125 MW power plant's fire protection water system will be supplied from a dedicated 360,000-gallon portion of the 500,000-gallon raw water storage tank located on the plant site. One electric and one diesel-fueled backup firewater pump, each with a capacity of 3,000 gallons per minute, will deliver water to the fire protection water-piping network for each plant. A smaller electric motor-driven jockey pump will maintain pressure in the piping network. If the jockey pump is unable to maintain a set operating pressure in the piping network, the diesel fire pump starts automatically.

The piping network will be configured in a loop so a piping failure can be isolated with shutoff valves without interrupting the supply of water to a majority of the loop. The piping network will supply fire hydrants located at intervals throughout the power plant site, a sprinkler deluge system at each unit transformer, HTF expansion tank and circulating pump area, and sprinkler systems at the STG, and in the operations and administration buildings. Portable fire extinguishers of appropriate sizes and types will be located throughout the plant site.

Fire protection for the solar field will be provided by zoned isolation of the HTF lines in the event of a rupture that results in fire. As vegetation or other combustible materials will not be allowed in the solar field, the HTF will be allowed to extinguish itself naturally, since the remainder of the field is of nonflammable material (aluminum, steel, and glass) (see Section 5.14, Worker Safety, for additional discussion of on- and off-site fire protection measures).

Plant Auxiliary Systems

The following plant auxiliary systems control, protect, and support the power plant and its operation.

Distributed Control System - The Distributed Control System (DCS) provides control, monitoring, alarm, and data storage functions for power plant systems. These include:

- Control of the STG, SSG system, and balance-of-plant systems in a coordinated manner
- Monitoring of operating parameters from plant systems and equipment
- Visual display of the associated operating data to control operators and technicians
- Detection of abnormal operating parameters and parameter trends
- Provision of visual and audible alarms to apprise control operators of such conditions
- Storage and retrieval of historical operating data

The DCS is a microprocessor-based system. Redundant capability is provided for critical DCS components such that no single component failure will cause a plant outage. The DCS consists of the following major components:

- Computer monitor-based control operator interface (redundant)
- Computer monitor-based control engineering work station
- Multi-function processors (redundant)
- Input/output processors (redundant for critical control parameters)
- Field sensors and distributed processors (redundant for critical control parameters)
- Historical data archive
- Printers, data highways, data links, control cabling, and cable trays

The DCS is linked to the control systems furnished by the STG supplier and the solar field controls. These datalinks provide STG control, monitoring, alarm, and data storage functions via the control operator interface and control technician workstation of the DCS.

Lighting System - The Project's lighting system will provide operations and maintenance personnel with illumination in both normal and emergency conditions. The system will consist primarily of AC lighting, but will include DC lighting for activities or emergency egress required during an outage of the plant's AC electrical system. The lighting system will also provide AC convenience outlets for portable lamps and tools. Lighting will be designed to provide the minimum illumination needed to achieve safety and security objectives and will be shielded and oriented to focus illumination on the desired areas and minimize additional nighttime illumination in the site vicinity.

Cathodic and Freeze Protection Systems - Cathodic protection systems protect against electrochemical corrosion of underground metal piping and structures. Underground metal piping structures will have cathodic protection as necessary based on soil conditions. Freeze protection systems (heat tracing) will be employed to protect small water and condensate piping systems that cannot be easily drained. Also due to the high freezing temperature of the solar field's HTF (54°F), steam-fed HTF freeze protection heat exchangers will be provided to protect the system during the night hours and colder months.

Service Air and Instrument Air Systems - The service air system supplies compressed air to hose connections located at intervals throughout the power plant. Compressors deliver compressed air at a regulated pressure to the service air-piping network. The instrument air system provides dry, filtered air to pneumatic operators and devices throughout the power plant. Air from the service air system is dried, filtered, and pressure regulated prior to delivery to the instrument air-piping network.

HTF Leak Detection - Leak detection of HTF will be accomplished in a combination of ways. Small leaks, possibly at ball joints or other connections, will be located based on daily inspection of the solar field. Those small leaks can then be corrected via repacking of joints or valves or by minor repairs if needed. The ability to isolate loops and sections

of the field will allow for quick repairs. In order to identify and react to larger sudden leaks quickly, the Project is considering a combination of remote pressure sensing equipment and remote operating valves that would allow for isolation of large areas of the field, or possibly the entire field. Such features will be developed as part of the detail design process.

POWER PLANT CIVIL/STRUCTURAL FEATURES

The following subsections describe civil/structural features of the Project, as illustrated in the power block arrangements presented in Figures 3.4-2 and 3.4-3. The power plant will be designed in conformance with 2007 California Building Code and the applicable wind and seismic criteria for site location. As noted earlier, sensitive Project facilities (*e.g.,* power block, evaporation pond) will be placed at specific on-site locations that avoid mapped AP fault zones.

SSG System, STG and Associated Equipment - The SSG system, STG, and condenser will be located outdoors and supported on reinforced concrete mat foundations. The STG foundation will include a reinforced concrete pedestal that supports the STG above the surface condenser. The one step-up transformer and GSUT will be supported on reinforced concrete mat foundations. Balance-of-plant (BOP) mechanical and electrical equipment will be supported on individual reinforced concrete pads. BOP components/materials include piping, valves, cables, switches, etc. that are not included with major equipment and are generally installed or erected onsite.

Solar Array Support Structures - Each solar collector array will be supported by structures (stands) that connect the parabolic troughs to the drive mechanism. Each array will be supported by multiple individual foundations with a foundation located approximately every 40 feet along the array. Foundation design will be based on site-specific geotechnical conditions to ensure the solar array stands are able to support all loading conditions (including wind loading) at the Project site.

Buildings - The Project will include a common administration building and warehouse between the two 125 MW power plants. A control building will be located in each power block. The design and construction of the administration building and warehouse will be consistent with normal building standards. Other plant site “buildings” will include the water treatment building, as well as a number of pre-engineered enclosures for mechanical and electrical equipment. Building columns are supported on reinforced concrete mat foundations or individual spread footings and the structures rest on reinforced concrete slabs. The total square footage of the various Project buildings and pre-engineered enclosures (*e.g.,* control rooms, administration building, warehouse, electrical equipment enclosures, fire pumps, and diesel generators) is approximately 39,000 square feet.

Water Storage Tanks - There will be a number of covered water tanks on site for each 125 MW power plant. For each plant, there will be a 500,000-gallon raw water storage tank for short-term backup cooling water supply, with a portion (360,000 gallons) dedicated to the plant’s fire protection water system; a 1,250,000-gallon treated water storage tank; and a 250,000 waste water storage tank. There also will be a 40,000-gallon storage tank for storage of demineralized water. Water storage tanks will be

vertical, cylindrical, field-erected steel tanks supported on foundations consisting of either a reinforced concrete mat or a reinforced concrete ring wall with an interior bearing layer of compacted sand supporting the tank bottom.

Roads, Fencing, and Security - The Project site is located in a remote section of eastern Riverside County, about four miles north of I-10, and approximately 25 miles west of Blythe. All vehicular traffic approaching the site will use I-10. Only a small portion of the overall plant site will be paved, primarily the site access road and portions of each power block (paved parking lot and roads encircling the STG and SSG areas). The entire site will be fenced appropriately to restrict public access during construction and operations. In order to ensure that the facility site is not the target of unauthorized access, staff has required the implementation of site security measures that are discussed in the **Hazardous Material Management** section of this document. These measures would provide appropriate levels of security to protect electrical infrastructure from malicious mischief, vandalism, or domestic/foreign terrorist attacks.

Site Drainage - As discussed in the **Soil & Water** section under the Drainage Erosion and Sediment Control Plan (DESCP), natural drainage across the site is episodic, shallow, and occurs over a broad area primarily as sheet flow or in shallow washes. In desert regions, the catchment boundaries and distribution of drainage may shift over time based on the ground conditions, intensity of the storm event, velocity of the flow, and sediment transportation including USGS quadrangle maps and aerial images. The watershed boundary and sub-basin boundaries selected for this Project site were based on existing information. The total watershed modeled encompasses 93,182 acres of which 91,696 acres are off-site.

Under post-developed conditions, it is proposed to divert the off-site watershed in three channels:

- Runoff from sub-basin 1 (north-western) will be diverted through a channel on the west side of the west 125 MW unit.
- Runoff from sub-basin 2 (north) will be diverted through a channel between the two 125 MW units.
- Runoff from sub-basin 3 (north-eastern) will be diverted though a channel along the east side of the east 125 MW unit.

Consultation with the CDFG resulted in a determination on jurisdiction of state waters, which is discussed in the **Biological Resources** and **Soil & Water Resources** sections of this document.

These three main channels and associated diversion berms on the down slope sides will divert flows downstream of the site following their existing drainage paths, causing no impact to the site. The channels and diversion berms will be sized sufficiently to pass the anticipated flows and entrained sediment volumes; will be armored as necessary for erosion protection using natural gravel derived during site grading activities; and will be

maintained periodically or after major storm events as needed to sustain their proper function. The main purposes of the diversion are to prevent interaction with off-site storm water and on-site storm water which will:

- Allow natural groundwater recharge of the off-site storm water with no contact with the changed flow conditions of the on-site water.
- Protect the site infrastructure from flash flood events, which have the potential to damage the solar parabolic troughs.
- Control treatment of the on-site flows from the solar collector array (location of HTF within the solar parabolic troughs).
- Protect the site from upstream sediment loading.
- Control on-site flows in detention basins to ensure there is no increase in post developed flow discharging from the site, minimize the impact on downstream drainage features (lake playas, etc).
- Maximize the developable area within the solar field.

On-site storm water management for the completed facility will be provided through the use of source control techniques, site design, and treatment control. The Project will employ a comprehensive system of management controls, including site-specific Best Management Practices (BMPs), to minimize storm water contact with contaminants and thus minimize pollutants in storm water. These management controls include:

- Erosion Control
- Sediment Control
- Wind Erosion
- Tracking Control
- Non-stormwater discharges
- Waste Management

Earthwork - Solar fields have fairly stringent grading requirements as parabolic troughs must be almost level along their troughs and grades perpendicular to the troughs are generally benched to two percent or less. Under pre-developed conditions, each 125 MW module generally slopes from the northeast to the southwest. Grading for post-developed conditions will slightly modify the existing contours to provide a surface level appropriate for the parabolic troughs. The preliminary grading is designed to ensure the run-off from solar fields is directed into the appropriate drainage channel, and the power block, evaporation ponds, and land farm units are protected in the 100-year, 24-hour storm event.

TRANSMISSION FACILITIES

Interconnection to Substation - The Genesis switchyard will contain three breakers and three line takeoff structures. It will have space for a future breaker and line takeoff structure. Air insulated structures will be utilized giving the switchyard a size of approximately 270 feet by 400 feet. The switchyard and interconnections will be built for

230 kV and will operate at that nominal voltage. Instrument transformers (current and capacitive voltage transformers) will be included for protection. Shield wires and lightning arrestors will be included to protect substation equipment and personnel against lightning strikes. The switchyard arrangement is shown in the power block layout general arrangement for unit two.

The generated electrical power from the Project switchyard will be transmitted through a generation-tie (gen-tie) line that will be routed in a southeasterly ROW eventually connecting to the proposed Southern California Edison (SoCal Edison) 500-230 kV Colorado River substation via the Blythe Energy Project Transmission Line (BEPTL). Please see **Project Description Figure 4**.

Interconnection Design Considerations - The gen-tie line will be constructed for operation at 230kV, the nominal operating voltage of the regional transmission system. The use of 230 kV as the targeted design voltage in the AFC is consistent with the industry use of the 230-kV term to describe the nominal voltage for this class of system. Each circuit will be supported by mono-pole structures at approximately 800 feet intervals with final heights as determined during detailed design. The lines will be insulated from the poles using porcelain insulators engineered for safe and reliable operation at a worst-case voltage of 241.5 kV (nominal, plus five percent). Shield wires will be included along the length of the lines to protect against lightning strikes (see Figure 4.2-1 in Section 4, Safety and Reliability). The pole designs were engineered to provide conceptual design limits for purposes of the electrictromagnetic field (EMF) studies and in accordance with the current Blythe-Julian Hinds structures.

- **Transmission System Upgrades -** The Project will require an interconnection upgrade at the Colorado River Substation. All impacts, and appropriate mitigation, have not been fully identified at this point in terms of the forthcoming Phase II Interconnection study of 2,200 MW of generation. However, 9,690 MW of generation in the Genesis cluster Phase I Interconnection study indicated that the project interconnection to the grid would not result in downstream transmission impacts.

PROJECT CONSTRUCTION

Power Generation Facility - Major milestones of the planned Project construction schedule are as follows:

- Begin construction Unit 1: Month 1
- Startup and test Unit 1: Month 21
- Commercial operation Unit 1: Month 25
- Begin construction Unit 2: Month 12
- Startup and test Unit 2: Month 33
- Commercial operation Unit 2: Month 39

Project construction is expected to occur over a total of 39 months. Project construction will require an average of 650 employees over the entire construction period, with labor requirements peaking at approximately 1100 workers in Month 23 of construction. The

construction workforce will consist of laborers, craftsmen, supervisory personnel, support personnel, and construction management personnel. Please see the **Socioeconomics and Environmental Justice** section of this document for a detailed discussion and breakdown of the construction workforce, by skill, over the entire construction period. Construction of each 125 MW Unit is expected to take approximately 25 months with each unit being phased by 12 months.

Temporary construction laydown and parking areas will be provided within the power plant site (see Figure 3.4-1). Construction power will be provided by the local distribution system and routed to the site along wood poles within the 230 kV ROW. Due to the size of the plant site, the solar field laydown area will be relocated periodically as the solar field is built out. The construction sequence for power plant construction includes the following general steps:

Site Preparation: this includes detailed construction surveys, mobilization of construction staff, grading, and preparation of drainage features. Grading for the solar field, power block, and rerouted wash will be completed during the first nine months of the construction schedule.

Foundations: this includes excavations for large equipment (STG, SSG, GSUT, cooling tower, etc.), footings for the solar field, and ancillary foundations in the power block.

Major Equipment Installation: once the foundations are complete, the larger equipment will be installed. The solar field components will be assembled in an on-site erection facility and installed on their foundations. Equipment and materials will be delivered to the Project plant site by truck; large components (*e.g.,* STG) will be brought by rail to a rail siding in the town of Blythe and then are expected to be trucked to the site on I-10.

BOP: with the major equipment in place, the remaining field work will be piping, electrical, and smaller component installations.

Testing and Commissioning: testing of subsystems will be done as they are completed. Major equipment will be tested once all supporting subsystems are installed and tested. ‘

Civil Works - The construction sequence for civil works includes the following general steps:

Site Disturbance: Once all areas are appropriately staked and signed and access to the site has been established, grading activities will occur over an extensive portion of the site. Grading will commence with rough grading activities, including grubbing, clearing, moisture conditioning, bulk grading, and initial compaction. The first ground-disturbing activities to take place will be the initial clearing and grading to prepare the site for the storm water drainage, construction, and equipment foundation pads. Temporary drainage ditches and berms will also be designed around construction work areas, soil stockpile areas, and excavation areas to minimize the amount of potential pollutant or sediment-laden surface water runoff.

Site Grading: The solar pad grading of the site will have an average slope of one to three percent on the north-south direction. Each solar pad will be graded with the intent of balancing the cut-and-fill as much as possible to minimize earth movement on the site. Drainage diversion channels and protective berms will also be developed with a balance of cut and fill earthwork.

Site Drainage: The post-development sediment/retention basin at the discharge points will provide storm water pollution prevention BMP controls, along with retention time to reduce the peak off-site discharge to match pre-development conditions. The road berm will also be constructed to provide site protection from storm water run-on during a 100-year return storm event. The toe of the western protective berm slope may be armored with soil cement cover and rip rap to provide for slope erosion protection during a heavy storm event.

Internal Road System: A primary access road will be constructed to the power block area. This road will be 24 feet wide and paved with approximately 3,000 tons of imported asphalt concrete material. Auxiliary roads will be 24 feet wide and use compacted native materials or gravel surface.

Restoration of Temporary Disturbance: All temporarily disturbed areas will be restored to their preconstruction conditions, as required by the BLM. Temporary access roads used during construction will also be regraded and restored to pre-existing function and grade. BLM-approved seed mixes will be applied to temporarily disturbed areas, as required. No fertilizer will be used during stabilization or rehabilitation activities unless authorized by the BLM. No vegetation will be restored or encouraged within the solar field because of the fire hazard. Vegetation within the LTU area will be controlled to prevent containment from being compromised. When construction of storm water management structures is complete, contours will be carefully restored to the extent feasible.

Generator Tie Line - The gen-tie line will be constructed with crews working continuously along the ROW, with construction of the entire gen-tie line requiring a peak workforce of approximately 34 workers. Gen-tie line construction will include the following activities:

- Preparation of marshalling yards
- Access road and spur road construction
- Clearing and grading of pole sites
- Foundation preparation and installation of poles
- Conductor installation
- Cleanup and site reclamation

Various construction activities would occur during the construction process with several construction crews operating simultaneously at different locations. The following subsections describe in more detail the construction activities associated with the Project gen-tie line.

Marshalling Yards: Construction staging/laydown and parking areas are proposed for two locations: 1) within the Project site, and 2) at the Wiley Well Rest area. Construction materials such as concrete, wire and cable, fuels, and small tools and consumables would be delivered to the staging/laydown areas by truck. Mobile trailers or similar suitable facilities (for example, modular offices) would be used for construction offices to be located at the Project staging/laydown areas.

Road Work: The construction, operation, and maintenance of the proposed gen-tie line would require that heavy vehicles access structure sites along the road. The Project proposes to use the newly constructed site access road and Wiley Well Road for all construction, operation, and maintenance activities associated with the gen-tie line. If required, new spur roads, approximately 14 feet wide and averaging 70 feet in length, would be constructed from the access roads to the structure sites. Each spur road would lead to a construction pad for a pole structure.

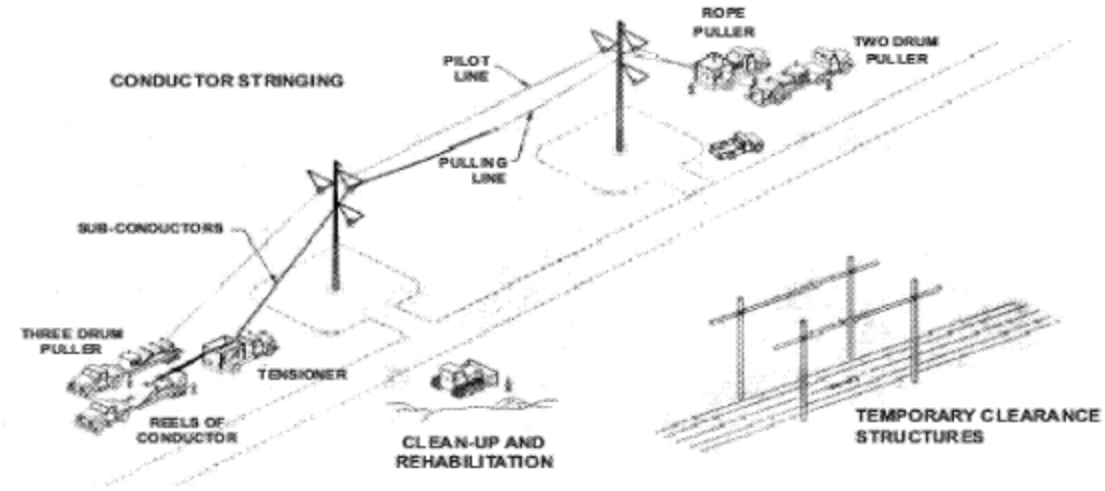
Pole Pads: At each site, a work area would be required for the structure footing location, structure assembly, and the necessary crane maneuvers. The work area would be cleared of vegetation only to the extent necessary and the construction pad would be leveled to facilitate the safe operation of equipment such as construction cranes.

Pole Erection: Transmission line pole structure foundation excavations would be made with power drilling equipment. A vehicle-mounted power auger or backhoe would be used to excavate for the structure foundation. Although not expected, in some instances blasting could be necessary because of specific geologic conditions. In the unlikely event blasting is necessary, conventional or plastic explosives would be used. Safeguards (*e.g.* blasting mats) would be employed when adjacent areas require protection. ‘

Conductor Installation: Typical conductor stringing activities are illustrated below. Crossing structures would consist of H-frame wood poles placed on either side of an obstacle. These structures would prevent ground wire, conductors, or equipment from falling on an obstacle and would be removed following the completion of conductor installation. Equipment for erecting the crossing structures would be the same as the equipment discussed above for transmission pole installation. Crossing structures may not be required for small roads or other areas where suitable safety measures such as barriers, flagmen, or other traffic controls could be used.

Pilot lines would be pulled (strung) from structure to structure and threaded through the stringing sheaves at each structure. This phase of work may be accomplished through the use of helicopters to minimize or otherwise eliminate the need to traverse the ROW along the ground from structure to structure. Following the pilot lines, a larger diameter stronger line would be attached to the conductors to pull

them onto the structures. This process would be repeated until the ground wire or conductor is pulled through all sheaves.



Source: AFC, page 3-30.

Pulling Sites: The shield wire and conductors would be strung using powered pulling equipment at one end and powered braking or tensioning equipment, approximately one mile apart. Tensioners and/or pullers, line trucks, wire trailers, and tractors needed for stringing and anchoring ground wire or conductor would be necessary at each pulling site. The tensioner, in concert with the puller, would maintain tension on the shield wires or conductors while they would be pulled through the structures. There will be approximately 25 pulling sites required to install the conductors along this segment of the gen-tie line. The sites will be accessed from the Project access roads or Wiley's Well Road.

Clean up and Site Reclamation: Construction sites, material storage yards, and access roads would be kept in an orderly condition throughout the construction period. Approved enclosed refuse containers would be used throughout the Project. Refuse and trash would be removed from the sites and disposed in an approved manner. Oils or chemicals would be hauled to a disposal facility authorized to accept such materials. Open burning of construction trash would not be acceptable.

The post-construction ROW would be restored as required by the BLM. All practical means would be made to restore the land to its original contour and restore the natural drainage patterns along the ROW. Because re-vegetation would be difficult in many areas of the Project because of low amounts of precipitation, it would be important to minimize disturbance during construction.

Natural Gas Pipeline - Construction of the gas pipeline will be the responsibility of SoCal Gas (SCG) and is expected to take three to six months with a peak workforce of approximately 46 workers. Provisions for construction contractor employee parking for the pipeline construction will be accommodated by the Applicant at the plant site, except for those supervisory contractor employee and agency inspection vehicles which must be temporarily parked along the route while construction takes place. Most major pieces of pipeline construction equipment will remain along the pipeline ROW during

construction with storage and staging of equipment and supplies either located at the Project plant site or other acceptable site selected by SCG at the time construction is underway. Excavated earth material would be stored within the construction ROW. During nonworking hours, any open trench will be covered with wood or other material of sufficient strength to support wildlife.

Trenching: The optimal trench will be approximately 48 inches wide and 4 to 10 feet deep. With loose soil, a trench up to eight feet wide at the top and three feet wide at the bottom may be required. The trench depth will provide a minimum cover of 36 inches.

Stringing: The pipeline components will be staged along the trench on wooden skids in preparation for installation.

Installation: Installation consists of bending, welding, and coating the weld-joint areas of the pipe after it has been strung, padding the ditch with sand or fine spoil, and lowering the pipe string into the trench following non-destructive testing of all welds.

Backfilling: consists of returning spoil back into the trench around and on top of the pipe, ensuring the surface is returned to its original grade or level. The backfill will be compacted to protect the stability of the pipe and minimize subsequent subsidence.

Trenchless construction methods may be used for short crossings under existing water lines or other buried pipelines. Boring pits will be dug on each side of the crossing to accommodate the process. Cleanup consists of restoring the surface of the roadway or ROW by removing any construction debris, grading to the original grade and contour, and revegetating or repairing where required.

FACILITY OPERATION

The Project will have a moderate sized workforce during operation; an estimated total workforce of 40 to 50 full time equivalent personnel will be needed to staff the facility 24 hours per day/seven days per week. When the solar facility is not operating (i.e. generating electricity), personnel will nonetheless be present for necessary maintenance, start-up, and/or site security.

FACILITY CLOSURE

Facility closure can occur on either a temporary or permanent basis. Temporary closure is a cessation of facility operations for a period of time greater than would be required for routine maintenance, overhaul, or replacement of major plant equipment. Temporary closures may be caused by damage to the facility from events such as fire, earthquake, or other natural occurrences, or by short-term economic considerations.

Permanent closure is a cessation of facility operations with no intent to restart. Permanent closure may result from a combination of facility age and economic considerations, or from damage considered beyond repair or other reasons. Temporary and permanent facility closures are both discussed in detail in the **Joint Conditions of Certification** section of this document.

Temporary Closure - In the case of a temporary closure, security for the Project facilities will be maintained on a 24-hour basis and the CEC and other responsible agencies will be notified. The course of action that will be followed will depend on whether or not the temporary closure involves a release of hazardous materials.

If there is no actual or threatened release of hazardous materials, a contingency plan will be implemented for the temporary halting of facility operations. The purpose of this contingency plan, to be developed prior to the beginning of operations, is to ensure compliance with all applicable Laws, Ordinances, Regulations, and Standards (LORS) and appropriate protection of public health, safety, and the environment. Depending on the expected duration of the temporary shutdown, the contingency plan may include the draining and proper disposal of chemicals from storage tanks and other facility equipment, the safe shutdown of all plant equipment, and various other measures to protect onsite workers, the public, and the environment.

If the temporary closure involves an actual or threatened release of hazardous materials to the environment, procedures will be implemented as provided in a Hazardous Materials Business Plan that will be developed for the Project (see Section 5.12, Hazardous Materials Handling). Procedures will include, but not be limited to, the following:

- Measures to control the release of hazardous materials.
- Requirements for notifying the appropriate agencies and the public.
- Emergency response procedures.
- Training requirements for Project personnel in hazardous materials release response and control.

Once the hazardous materials release has been resolved, temporary closure will proceed as described above for temporary closure without a hazardous materials release.

Permanent Closure - The planned operational life of the Project is 30 years, but the Project facility conceivably could operate for a longer or shorter period depending upon economic considerations or other circumstances. For example, if the Project facility remains economically viable, it could operate for more than 30 years, which would defer environmental impacts associated with closure and with the development of replacement power generating facilities. However, if the facility were to become economically non-viable before 30 years of operation, it could be closed permanently at an earlier time.

Regardless of when permanent closure occurs, a decommissioning plan specifying the appropriate closure procedures will be developed and implemented. As in the case of a temporary closure, security for the Project facility will be maintained on a 24-hour basis. During permanent closure, the Energy Commission and other responsible agencies including the BLM will be notified of the decommissioning schedule and plans.

The procedures provided in the decommissioning plan will be designed to ensure public health and safety, environmental protection, and compliance with applicable LORS.

Prior to the beginning of permanent closure activities, the decommissioning plan will be submitted to the CEC for review and approval.

Depending on conditions at the time of closure, the closure measures may range from extensive “mothballing” to the complete removal of Project equipment and other structures. In general, the decommissioning plan for the Project will address the following:

Proposed decommissioning measures for the power plant and all associated facilities constructed as part of the Project, designation of equipment and appurtenances to be removed or that may remain in place, as applicable.

- Activities necessary for site reclamation.
- Provisions for recycling facility components, collection and disposal of wastes, and resale of unused chemicals back to suppliers or other parties.
- Decommissioning alternatives other than full restoration of the site.
- Costs associated with the proposed decommissioning and reclamation activities and the source of funds to implement these activities.
- Conformance with applicable LORS and with local/regional plans.

As it is not possible to predict at present the conditions that will exist at the time decommissioning decisions must be made, decommissioning details will be developed and provided to the CEC when the time for permanent closure is closer and more information is available.

If the evaporation ponds or LTU require temporary closure, the Closure and Post-Closure Maintenance Plan shall be implemented. A Preliminary Closure and Post-Closure Maintenance Plan for both waste management units will be submitted to the Colorado River Regional Water Quality Control Board with the application for a Report of Waste Discharge (RoWD) (please see the **Waste Management** section of this document for a more detailed discussion).

ALTERNATIVES RETAINED FOR ANALYSIS

Three alternatives are retained for analysis within each discipline’s section:

- Reduced Acreage Alternative
- Dry Cooling Alternative
- No Project/No Action Alternative

REDUCED ACREAGE ALTERNATIVE

The Reduced Acreage Alternative would essentially be Unit 1 of the proposed project, including a 125 MW solar facility located within the boundaries of the proposed project as defined by NextEra (applicant). This alternative is analyzed for two major reasons: (1) it eliminates about 50 percent of the proposed project area so all impacts are reduced, and (2) by eliminating the eastern solar field, it would reduce the water

required for wet cooling by 50 percent. The boundaries of the Reduced Acreage Alternative are shown in **Alternatives Figure 1**.

The Reduced Acreage Alternative would have a net generating capacity of approximately 125 MW and would occupy approximately 900 acres of land. This alternative would retain 50 percent of the proposed project's generating capacity, and would affect 50 percent of the land affected by the proposed project. Specifically, the alternative would retain the Unit 1 solar field, including the construction parking, construction trailers, and temporary construction laydown area; the administration building and warehouse; the solar collector assembly area; the western evaporation pond area (approximately 24 acres); and the land farm area (approximately 10 acres). The alternative would require relocating the switchyard from the Unit 2 power block to the Unit 1 power block. The eastern evaporation pond area (approximately 24 acres) that corresponds with Unit 2 would not be included in the Reduced Acreage Alternative. This area could be used for the relocated gas yard if needed.

Similar to the proposed project, the Reduced Acreage Alternative would transmit power to the grid through the Colorado River Substation. It would require infrastructure, including groundwater wells, transmission line, road access, an administration building, and evaporation ponds. The required infrastructure and transmission line for the Reduced Acreage Alternative would follow the routes defined for the proposed project, even though Unit 1 would not be constructed. The linear facilities would require approximately 90 acres. The gas pipeline would be approximately 1 mile longer than for the proposed project.

Dry cooling is being evaluated as an alternative to the proposed project and could also be used with this configuration; however, if wet cooling were retained, approximately 822 acre-feet per year would be pumped during operations.

DRY COOLING ALTERNATIVE

Description of the Process and Equipment Required

There are two types of dry cooling systems: direct dry cooling and the less-used indirect dry cooling. In both systems, fans blow air over a radiator system to remove heat from the system via convective heat transfer (instead of once-through cooling or evaporative heat transfer). In the direct dry cooling system, also known as an air-cooled condenser (ACC), steam from the steam turbine exhausts directly to a manifold radiator system that rejects heat to the atmosphere, condensing the steam inside the radiator. Direct dry cooling is analyzed as an alternative to the wet cooling proposed by NextEra for the Genesis Solar Energy Project.

Dry cooling is the best choice of cooling technologies for a steam power plant to conserve water and minimize wastewater. However, this technology can create both environmental and economic concerns, depending on the location and specific situation. These concerns are evaluated for the GSEP site specifically in Sections C and D of each individual technical discussion of this SA/DEIS.

Advantages and Disadvantages of Dry Cooling

The following is a general list of the general advantages and disadvantages of dry cooling.

Advantages of Dry Cooling Systems

- Dry cooling allows a power plant location to be independent of a water source. It has essentially no water intake or water discharge requirements.
- Dry cooling minimizes the use of water treatment chemicals.
- Dry cooling minimizes the generation of liquid and solid wastes.
- Dry cooling does not generate visible plumes that are commonly associated with wet cooling towers.
- Dry cooling eliminates impacts to aquatic biological resources.
- Dry cooling eliminates the need for discharge permits.
- Dry cooling eliminates the need for disturbance of wetland/aquatic substrate habitat.

Disadvantages of Dry Cooling Systems

- Dry cooling requires air-cooled condensers that could have negative visual effects.
- Compared to once-through cooling, dry cooling requires the disturbance of a larger area for the air-cooled condensers than that required for cooling towers.
- Dry cooling can have noise impacts that are greater than once-through or wet cooling systems because of the number of fans and the considerably greater total airflow rate. New quieter fans and other mitigation measures are available to reduce these impacts.
- Using dry cooling, the power plant steam cycle efficiency and output can be slightly reduced, depending on site conditions and seasonal variations in ambient conditions. Also, extra power is needed to operate the cooling fans.
- Capital costs for building air-cooled condensers are generally higher than capital costs for once-through cooling.

Description of the Air Cooled Condensers

In order to compare the performance and impacts of a dry cooling system or ACC with that of the wet-cooled system, the operating conditions at a common design point must be established. The design and operation of an ACC are highly dependent upon the ambient conditions at a specific site.

Size, Configuration, and Layout

The size of an ACC is a function of the heat load from the steam turbine generator and the ambient conditions. The ACC is composed of tube bundles with fins attached to the tubes to enhance heat transfer to the air. These bundles are grouped together and mounted in an A-frame configuration on a steel support structure. These A-frame tube bundles are aligned in rows or bays. Steam is ducted directly from the steam turbine exhaust to the ACC where it enters in a parallel flow into the tubes across the top of the

bays. Air is blown from below across the finned tube bundles by a series of large fans, which are located beneath the A-frame tube bundles. Each fan is considered a module. To accommodate the large mass of air required for cooling the steam, the A-frame tube bundles are elevated on top of an open structure. As the steam passes down through the tube bundles, it is condensed and drains by gravity flow into a tank from which it is pumped back to the steam turbine. Since the steam is exhausted directly from the steam turbine generator after it has expanded through the turbine, it is at both a very low pressure and large volume. This condition limits the distance that the ACC can be located from the steam turbine generator, due to the drop in pressure that results during the transport of the steam; this limitation must be taken into consideration when configuring the plant layout.

Staff has not developed and analyzed detailed layouts for the ACC system. However, it is assumed that the ACC system would be located where the cooling towers are currently proposed. **Alternatives Figure 2** illustrates the approximate size and location of the ACC on the power block layout.

Approximately 18 ACC fans would be required for cooling each 125 MW power block when the ambient temperature is above 50 degrees Fahrenheit (GSEP 2009f). The 18 ACC fans described in the GSEP cooling study would have a length of approximately 279 feet, a width of approximately 127 feet, and a height of 98 feet (GSEP 2009f). However, based on the ACC preliminary designs for nearby solar thermal projects in similar ambient temperatures, an additional 11,690 square feet could be required for siting of the fans and the fans would be up to 120 feet in height. In addition to the ACC fans, NextEra would use a small Wet Surface Air Cooler when needed to provide auxiliary cooling during extremely hot days (GSEP 2009f). The proposed wet cooling towers and associated equipment occupy an area of about 420 feet long by 60 feet wide. While the ACCs would require about 40 to 50 percent more land area than the proposed wet cooling towers, from the site layout, it appears that such a system would fit in the approximate current location of the cooling tower as there is unused space between the power block and the solar collector assembly (GSEP 2009a). This unused space would have been previously graded as it is designed to be used for construction parking and construction trailers. An environmental assessment of the impacts of using dry-cooling instead of wet-cooling is presented in each individual technical discussion (Sections C and D) for each resource element.

NO PROJECT/NO ACTION ALTERNATIVE

CEQA No Project Alternative

The No Project Alternative under CEQA defines the scenario that would exist if the proposed Genesis Solar Energy 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, subd. (e)(2)).

If the No Project Alternative were selected, the construction and operational impacts of the Genesis Solar Energy Project would not occur. There would be no grading of the site, no loss of resources or disturbance 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 Riverside County and in the Sonoran Desert as a whole. **Project Description 3** provides a depiction of proposed solar energy application developments provided by BLM's Palm Springs – South Coast Filed Office.

In the absence of the Genesis Solar Energy Project, however, other power plants, both renewable and non-renewable, may have to be constructed to serve the demand for electricity and to meet the California Renewable Portfolio Standard (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 Genesis Solar Energy 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 existing, older and inefficient gas-fired plants, many of which rely on Once-Through Cooling (OTC), may operate longer. Importantly, if the proposed Genesis project were not built, California would not benefit from the reduction in greenhouse gases that this facility would provide, and California utilities would not receive the 250 MW contribution to their 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 Genesis Solar Energy Project (GSEP) 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 GSEP (250 MW), and to approve the project as proposed. If the GSEP and ancillary facilities are approved, a ROW grant would be issued, and the CDCA Plan would be amended to include Genesis' 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 Dry-Cooling Alternative or Reduced Acreage Alternative), 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 Genesis Solar Energy Project is not approved

(project denied), and no ROW grant is issued, but the CDCA plan is amended to make the project area available for large scale renewable energy development under a future project proposal.

- **No Action on project and amend the CDCA plan to make the area unavailable for future solar development.** The Genesis Solar Energy Project is not approved (project denied), and no ROW grant is issued, and the CDCA plan is amended to make the project area unavailable for large scale renewable energy development.
- **No Action on project application and no land use plan amendment**. The Genesis Solar Energy 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 technical discussion (Sections C and D) of this SA/EIS.

Project Objectives

The Project objectives, as indicated by the applicant, are as follows:

- To construct, operate and maintain an efficient, economic, reliable, safe and environmentally sound solar powered generating facility throughout its useful life to help: (i) achieve the State of California objectives mandated by SB 1078 (California Renewable Portfolio Standard Program), (ii) AB 32 (California Global Warming Solutions Act of 2006), and (iii) other local mandates adopted by the State's municipal electric utilities to meet the requirements for the long-term, wholesale purchase of renewable electric energy for distribution to their customers;
- To develop a site with an excellent solar resource;
- To develop a site with close proximity to transmission infrastructure in order to minimize associated environmental impacts;
- To develop a new utility-scale solar energy project using proven concentrated solar trough technology; and,
- To develop a site with available degraded ground water resources to allow wet cooling in order to maximize power generation, optimize efficiency, and reduce the delivered cost of electricity to customers.

B.1.5 DECOMMISSIONING AND RESTORATION

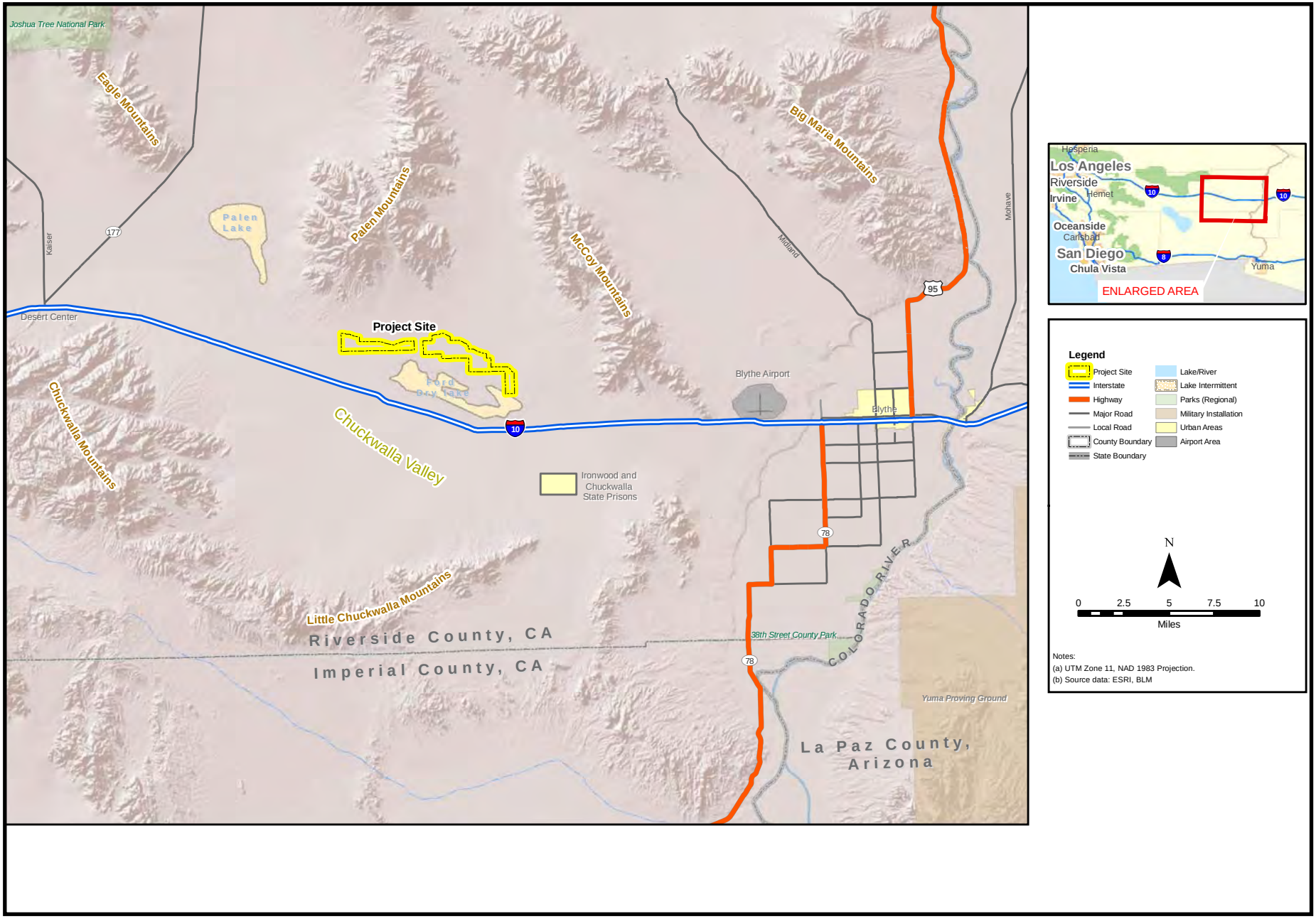
The planned operational life of the project is 30 years, but the facility conceivably could operate for a longer or shorter period depending on economic or other circumstances. If the project remains economically viable, it could operate for more than 30 years. However, if the facility were to become economically non-viable before 30 years of operation, permanent closure could occur sooner. In any case, a Decommissioning Plan will be prepared and put into effect when permanent closure occurs. The J**oint Conditions of Compliance** section of this document discusses this issue.

The procedures provided in the decommissioning plan will be developed to ensure compliance with applicable LORS, and to ensure public health and safety and protection

of the environment. The Closure Plan will be submitted to the CEC and BLM for review and approval prior to a planned closure. Depending on conditions at the time, permanent closure measures may range from extensive “mothballing” to the complete removal of project equipment and other structures.

PROJECT DESCRIPTION - FIGURE 1

Genesis Solar Energy Project - Projection Location

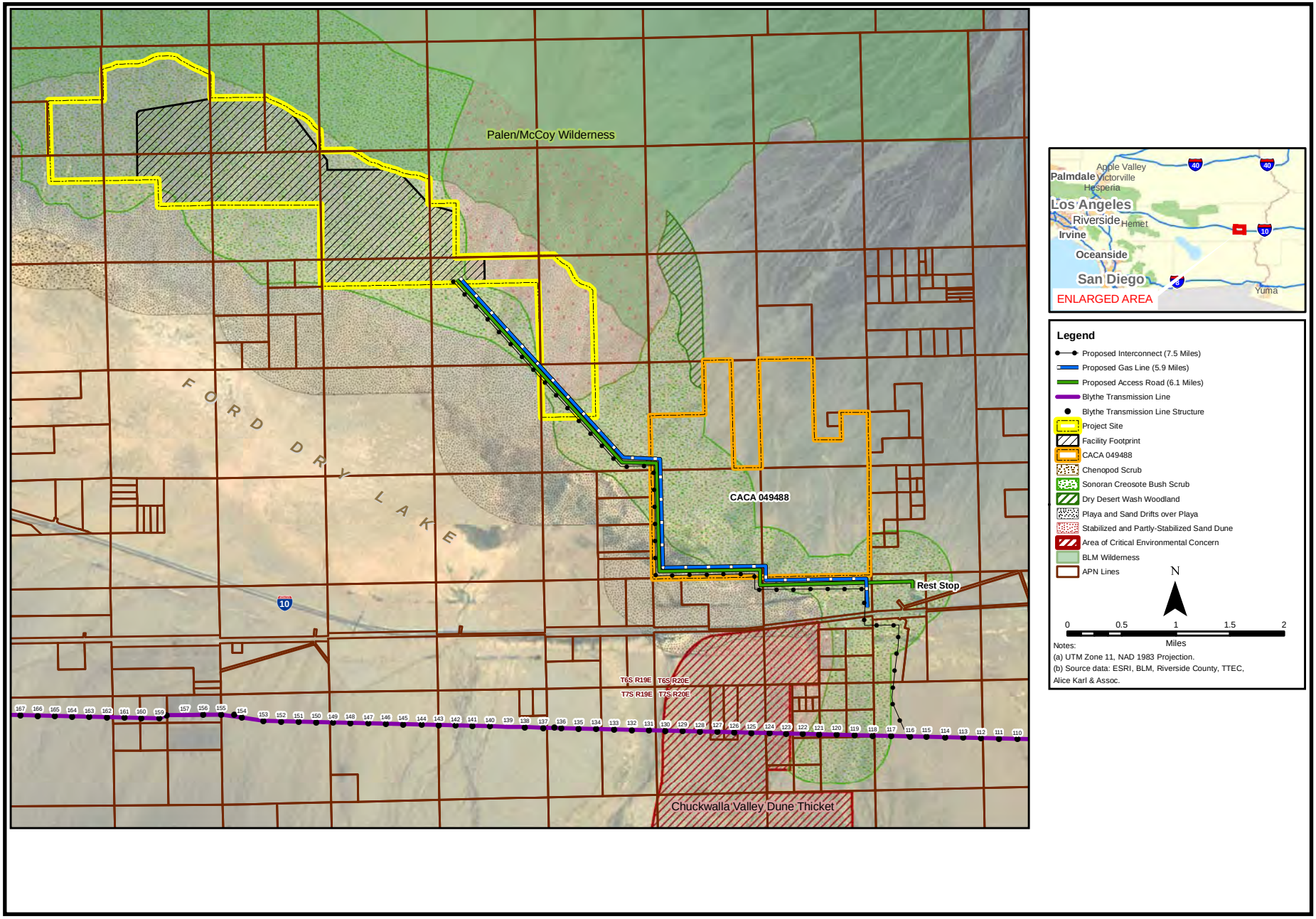


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010

SOURCE: AFC 3.2-1

PROJECT DESCRIPTION - FIGURE 2

Genesis Solar Energy Project - Facility Footprint and Linear Corridor Revision - December 2009

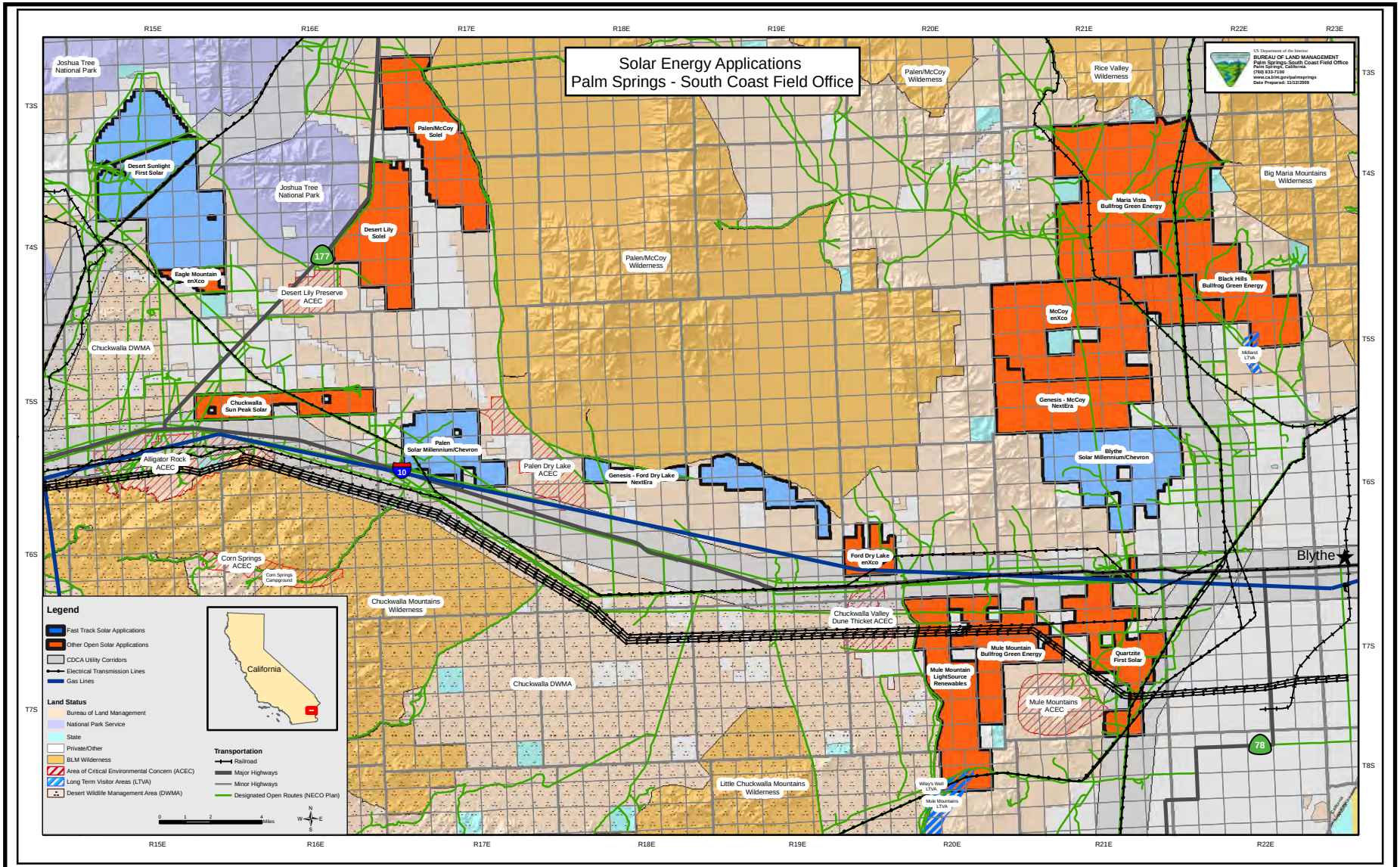


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010

SOURCE: AFC

PROJECT DESCRIPTION - FIGURE 3

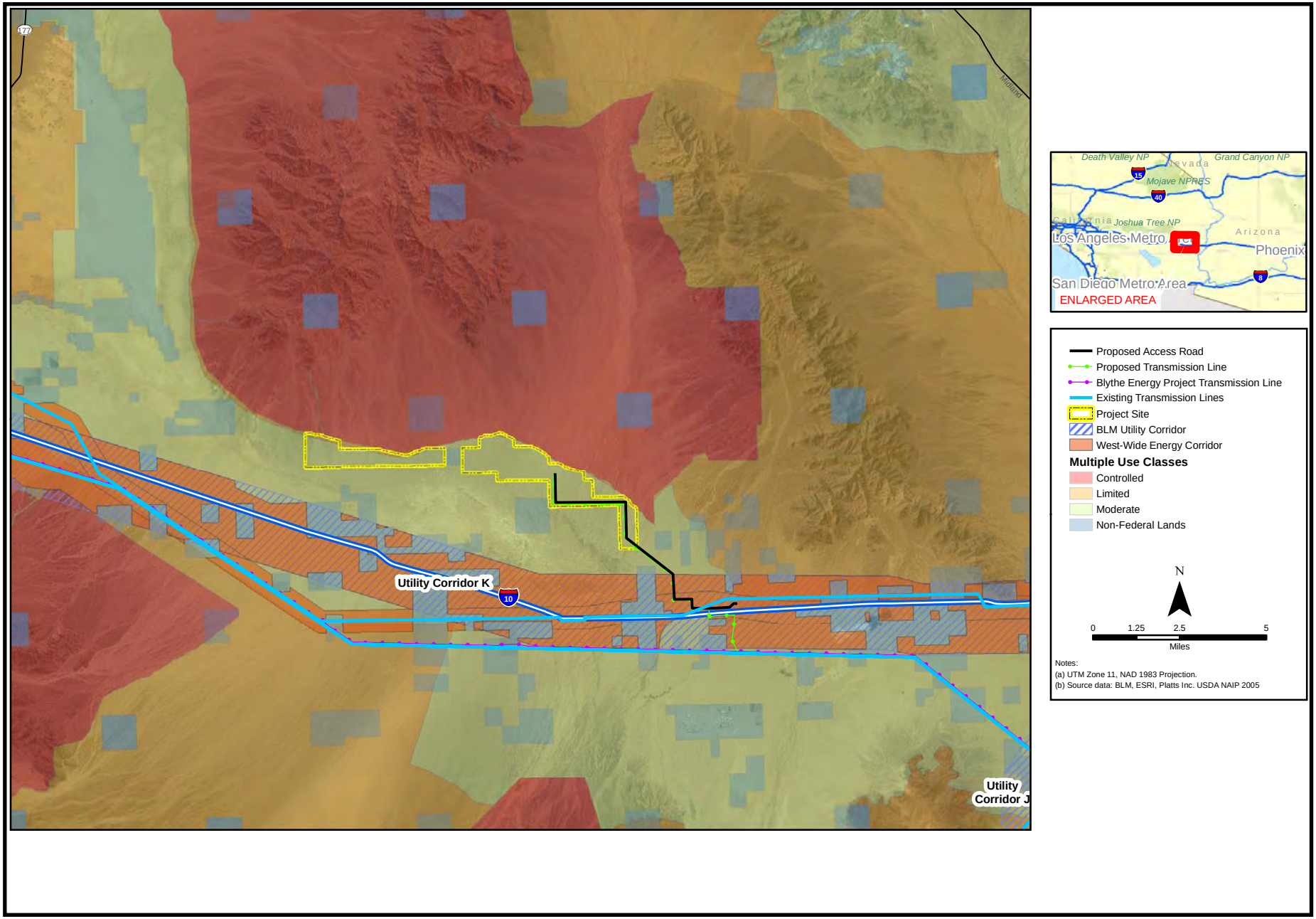
Genesis Solar Energy Project - Solar Energy Applications, Palm Springs - South Coast Office



SOURCE: AFC

PROJECT DESCRIPTION - FIGURE 4

Genesis Solar Energy Project - BLM Multiple Use Classifications Energy Corridors & Transmission Lines



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010

SOURCE: AFC Figure 5.7-1

B.2 – ALTERNATIVES EVALUATED

Testimony of Susan V. Lee

B.2.1 SUMMARY OF CONCLUSIONS

In this analysis of the Genesis Solar Energy Project, 25 alternatives to the project have been developed and evaluated. These include six alternative site locations or configurations, a dry cooling alternative, a range of different solar and renewable technologies, generation technologies using different fuels, and conservation/demand-side management. Of the 25 alternatives, two alternatives were determined to be reasonable and feasible by the Bureau of Land Management and the Energy Commission and have the potential to result in reduced impacts in comparison with the proposed project: the Reduced Acreage Alternative and the Dry Cooling Alternative. Both alternatives would also include and be complimentary to the proposed land use plan decisions located in Appendix B. Those areas that have studied and found to be unsuitable for development would be managed as future rights of way exclusion areas. In addition to the proposed action, the agencies considered three No Project/No Action Alternatives that would vary in their approach to considering the land use plan amendment.

The Reduced Acreage Alternative would be half as large as the proposed project and was found to reduce the impacts of the proposed GSEP by approximately 50 percent. It would affect substantially less Mojave fringe-toed lizard habitat, would substantially reduce the geomorphic impacts, and would create no impacts to the Chuckwalla and Palen-McCoy sand corridors. However, as highlighted in the Section C.1 (Air Quality), the Reduced Acreage Alternative would reduce the benefits of the proposed GSEP by approximately 50 percent. While the Reduced Acreage Alternative would meet most project objectives, it is uncertain whether the Reduced Acreage Alternative is economically feasible.

The Dry Cooling Alternative was found to have impacts similar to the proposed project for most resource elements. However, because it would use less water, it would reduce impacts to groundwater-dependent ecosystems and reduce impacts of the visible vapor plumes that the proposed project would create with use of cooling towers. The Dry Cooling Alternative was found to reduce the efficiency of the steam power cycles, which would slightly reduce the total amount of power generated. As a result, the benefits of the GSEP in replacing gas-fired power plants and associated greenhouse gases would be reduced. At this time, dry-cooling appears to be a feasible alternative to the GSEP's use of wet-cooling.

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 could lead to increased operation of existing power plants that use non-renewable technologies.

One site alternative was evaluated in detail by the Energy Commission under the California Environmental Quality Act only: the Gabrych Alternative, which was presented by the applicant. While the impacts of the Gabrych Alternative site would be similar to those of the proposed site in many resource elements, it is likely to have less

severe biological resources and cultural resources impacts, as it is located on disturbed lands used for agriculture. The Gabrych Alternative would be located on some active and some previously farmed agriculture land, resulting in a significant impact to agriculture.

Alternative solar thermal technologies (Stirling engine, solar power tower, utility scale solar photovoltaics, and linear Fresnel) are also evaluated. As compared with the proposed solar trough technology, these technologies would not substantially change the severity of visual impacts, biological resources impacts and cultural impacts, though land requirements and water use vary among the technologies. Distributed solar photovoltaic facilities would likewise require extensive acreage, although because it can be installed on existing buildings, it would minimize the loss of 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 Genesis Solar Energy Project, or would not reduce or eliminate significant impacts caused by the Genesis Solar Energy Project without creating their own significant impacts in other locations. 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. Other renewable generation technologies are not required to be analyzed by the BLM because they fall outside BLM's purpose and need for the proposed action, which is to is to respond to NextEra'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.

Conservation and demand side management programs would likely not meet the state's growing electricity needs that would be served by the Genesis Solar Energy Project. In addition, these programs would not provide the renewable energy required to meet the California Renewable Portfolio Standard requirements. Wave and tidal technologies are not yet commercially available in the United States.

Staff's analysis of renewable energy technology options indicates that contributions from each commercially available renewable technology will be needed to meet California's Renewable Portfolio Standard requirements and to achieve the statewide renewable energy target for 2020. Therefore, the combined contribution of the alternatives of wind, distributed solar photovoltaic, geothermal, and biomass is needed to complement rather than substitute for the Genesis Solar Energy Project solar thermal contribution to meeting statewide renewable energy 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 Renewable Portfolio Standard.

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 - 250 MW	Evaluated as the applicant's proposal.
Reduced Acreage Alternative - 125 MW	Evaluated in the SA/DEIS because it would substantially reduce impacts of the Genesis Solar Energy Project and meet the BLM purpose and need.
Dry Cooling Alternative	Evaluated in the SA/DEIS because it would substantially reduce impacts of the Genesis Solar Energy Project and meet the BLM purpose and need.
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 Genesis Solar Energy Project through a CDCA Land Use Plan Amendment	Action required under the CDCA Plan of 1980, as amended.
Amend CDCA Land Use Plan for a reduced size project or project including dry cooling within the proposed project's boundaries (125 MW)	A smaller project or a project including dry cooling 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 do 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.
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 Alternative Evaluated Under CEQA	
Gabrych Alternative	Would substantially reduce impacts of the Genesis Solar Energy Project while meeting most project objectives.
Alternatives Eliminated from Detailed Analysis	

Alternative	Rationale for Retention or Elimination
McCoy	Would not substantially reduce impacts of the Genesis Solar Energy Project; pending right-of-way grant application for the site, therefore not considered a viable alternative.
Desert Center 1	Desert Center 1 region was in an area that would potentially be subsumed in expansions of the Joshua Tree National Park and/or the McCoy Wilderness. In the fall of 2008, the BLM rejected the application for ROW grant for the use of the region.
Mule Mountain	Would not substantially reduce impacts of the Genesis Solar Energy Project; pending right-of-way grant application for the site, therefore not considered a viable alternative.
Black Hill	Would not substantially reduce impacts of the Genesis Solar Energy Project; pending right-of-way grant application for the site, therefore not considered a viable alternative.
Private Land Alternative	Portions of the private lands were analyzed as the Blythe Mesa Alternative in the Blythe Solar Power Project SA/EIS.
Western ROW Alternative	Would not substantially reduce impacts of the Genesis Solar Energy Project
Reclaimed Water Alternative	Sufficient reclaimed water is not available; would not substantially reduce impacts to the water accounting system for the groundwater basin
Stirling Dish Technology	Would not substantially reduce impacts of the Genesis Solar Energy Project.
Solar Power Tower Technology	Would not substantially reduce impacts of the Genesis Solar Energy Project.
Linear Fresnel Technology	Would reduce area required by about 40% but would not eliminate significant impacts of the Genesis Solar Energy Project.
Solar Photovoltaic Technology – Utility Scale	Would reduce water use but requires similar land area so would not substantially reduce impacts of the Genesis Solar Energy Project.
Distributed Solar Technology	While it will very likely be possible to achieve 250 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 Genesis Solar Energy 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.

Alternative	Rationale for Retention or Elimination
Wind Energy	While there are substantial wind resources in Riverside County, environmental impacts could also be significant so wind would not reduce impacts in comparison to the Genesis Solar Energy 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 250 MW of new geothermal generation capacity within the timeframe required for the Genesis Solar Energy Project appears to be unlikely.
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 25 and 80 facilities would be needed to achieve 250 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. It may also result in substantial adverse environmental impacts
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
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

B.2.2 INTRODUCTION

Genesis Solar, LLC (a subsidiary of NextEra) proposes to build the Genesis Solar Energy Project (GSEP) on BLM-administered land, which is federal land under the

administrative jurisdiction of the BLM. Since the BLM is a federal agency, the GSEP is subject to review under the National Environmental Policy Act (NEPA) in addition to the California Environmental Quality Act (CEQA). The purpose of this alternatives analysis is to comply with State and Federal environmental laws by providing a reasonable range of alternatives which, under CEQA, could substantially reduce 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. This section summarizes the potentially significant impacts of the proposed project and analyzes different technologies and alternative sites that may reduce or avoid significant impacts.

Of the 25 alternatives, two alternatives were determined to be both reasonable for the BLM and feasible for the Energy Commission: the Reduced Acreage Alternative and the Dry Cooling Alternative. 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.

This section presents analysis of one site alternative that is 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 detailed consideration by both the Energy Commission and the BLM.

B.2.3 ALTERNATIVES DEVELOPMENT AND SCREENING PROCESS

Laws, Ordinances, Regulations, and Standards

NextEra proposes to build the GSEP facility on federal land administered by the BLM. Since the BLM is a federal agency and the California Energy Commission has State authority to approve thermal power plants, the GSEP 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. NEPA declares that the Federal government's continuing policy is to create and maintain conditions under which people and nature can exist in productive harmony and fulfill the social, economic, and other requirements of present and future generations of Americans.

Regulations promulgated by the Council on Environmental Quality (CEQ) require that an EIS rigorously explore and objectively evaluate a reasonable range of 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.

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 was approved.

U.S. Army Corps of Engineers Regulations

The U.S. Army Corps of Engineers has not yet issued a determination regarding whether ephemeral drainages on the proposed GSEP site are jurisdictional waters of the U.S. 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.2.6. In addition, a range of other alternatives that comply with the Corps' guidelines are presented in Section B.2.8 (alternatives considered but eliminated from detailed analysis), and an offsite alternative is evaluated in Section B.2.7 (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. Under CEQA, 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. Under CEQA, identify and evaluate alternative locations.

4. Under CEQA, evaluate potential alternatives to select those qualified for detailed evaluation.

5. Under NEPA, explore and evaluate a reasonable range of alternatives, and of those reasonable alternatives, identify those that would avoid or minimize adverse impacts or enhance the quality of the human environment.

6. 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 effects of the project as described above;
- for CEQA purposes meet most project objectives;
- for NEPA purposes be consistent with the purpose and need to which BLM is responding.

B.2.4.1 Applicant's Project Objectives

The following objectives and purpose are set forth by NextEra (GSEP 2009a):

- To construct, operate, and maintain an efficient, economic, reliable, safe, and environmentally sound solar powered generating facility throughout its useful life to help: (i) achieve the State of California objectives mandated by SB 1078 (California Renewable Portfolio Standard Program); (ii) AB 32 (California Global Warming Solutions Act of 2006); and (iii) other local mandates adopted by the State's municipal electric utilities to meet the requirements for the long-term wholesale purchase of renewable electric energy for distribution to their customers.
- To develop a site with an excellent solar resource.
- To develop a site with close proximity to transmission infrastructure in order to minimize environmental impacts.
- To develop a new utility-scale solar energy project using proven concentrated solar trough technology.
- To develop a site with available water resources to allow wet cooling in order to optimize power generation efficiency and reduce project cost.

Additionally, NextEra states that the project would:

- Address local mandates that California's electric utilities have adopted for the provision of renewable energy.
- Assist the California Independent System Operator (CAISO) in meeting its strategic goals for the integration of renewable resources.
- Contribute to reductions in greenhouse gas emissions.

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 a utility-scale solar energy project of up to 250 MW and interconnect directly to the CAISO Grid while minimizing additions to electrical infrastructure; and
- To locate the facility in areas of high solar insolation.

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 Genesis Solar Energy Project at its proposed site, staff evaluated whether alternative technologies could meet the following key project objectives:

- to provide clean, renewable electricity to support California's Renewable Portfolio Standard Program (RPS);
- to assist in reducing greenhouse gas emissions as required by the California Global Warming Solutions Act; and
- to contribute to the achievement of the 33 percent renewables RPS target set by California's governor and legislature.

B.2.4.3 BLM Purpose and Need for Proposed Project and Plan Amendment

Bureau of Land Management. 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 comply 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 goals.

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 NextEra application for the proposed GSEP.

NextEra has filed an application with BLM for a 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 administered by the BLM for the purpose of allowing systems for generation, transmission, and distribution of electric energy.

The **BLM's Purpose and Need** for the GSEP is to respond to the NextEra 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 NextEra for the proposed GSEP. A land use plan amendment to the California Desert Conservation

Area (CDCA) Plan of 1980 would be required before BLM could issue the ROW grant. 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.

BLM Plan Amendment. As discussed in Section A, solar power facilities are an allowable use of lands designated as Multiple Use Class (MUC) L (limited use) areas (CDCA). Since the site for the proposed GSEP 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 GSEP 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. The plan would have to be amended prior to the approval of the proposed project. The result of the plan amendment may be that the Multiple Use Class would change from MUC L (limited use) to MUC I.

Department of Energy. NextEra has also applied to the United States (US) 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.

American Recovery and Reinvestment Funds. NextEra has also applied for American Recovery and Reinvestment Funds (ARRA) Renewable Energy Grant Program. Two goals of the ARRA Renewable Energy Grant Program are to enhance America's energy independence and create near-term employment opportunities for Americans. To be eligible for the ARRA funds, NextEra must begin construction on the GSEP by the end of 2010.

B.2.4.4 Impacts of the Proposed Project

Based on the analysis presented in the technical sections of this Staff Assessment/Draft Environmental Impact Statement (SA/DEIS), the following impacts, discussed in full in Sections C and D, have been identified as issues of greatest concern for the GSEP:

- Cultural Resources: The proposed GSEP would have a significant direct impact on 14 historically significant archaeological resources and a potential significant indirect impact on 1 ethnographic resource. Mitigation for project impacts to cultural resources will be handled in a Programmatic Agreement (PA) negotiated among all stakeholders-federal, state, and private. Development of the PA by the BLM is underway, but will not be completed until mid-summer.

- Biological Resource: The GSEP would have significant impacts to biological resources, eliminating all of the Sonoran creosote bush scrub and other native plant and wildlife communities within the approximately 1,880-acre site. The GSEP would result in loss of an extensive network of desert washes comprising approximately 83 acres of state jurisdictional waters, and would significantly alter the hydrology of the area by re-routing ephemeral drainages through engineered channels. The GSEP would impact 1,786 acres of desert tortoise habitat, including 23 acres within the Chuckwalla Desert Critical Habitat Unit. The proposed groundwater pumping would have an impact on groundwater levels in the Chuckwalla Valley Groundwater Basin with potential adverse effects to groundwater dependent sensitive plant communities and to wildlife. Cumulative Impacts: the indirect effects of development of the Chuckwalla Valley will contribute cumulatively to the overall loss of dune habitat, desert washes, and the fragmentation and degradation of the remaining habitat for Mojave fringe-toed lizard and several dune-dependent rare plant species. Proposed renewable energy development in Chuckwalla Valley could threaten what remains of the habitat and places several populations at risk, most notably, the local Chuckwalla population of the Mojave fringe-toed lizard.
- Soil and Water Resources: The proposed project would pump groundwater from the Chuckwalla Valley Groundwater Basin (CVGB). The proposed Project would have an impact on levels of groundwater in the Chuckwalla Valley Groundwater Basin (CVGB). However, the magnitude of potential impacts cannot be determined precisely. Proposed water use suggests that groundwater withdrawn from production wells draw from the Palo Verde Mesa groundwater basin, a tributary to the Colorado River and as a result, the proposed GSEP pumping may induce flows from the Colorado River. The proposed Project would be located on an alluvial fan where flash flooding and mass erosion could impact the Project. Project-related changes to the alluvial fan hydrology could result in impacts to adjacent land users. Cumulative impacts: analysis indicates that groundwater extraction during construction and operation of this and other reasonably foreseeable projects would place the basin into an overdraft condition. This impact may be exacerbated by other renewable energy projects in the I-10 corridor, which has been targeted as a potential area for further renewable energy development. However, the amount of water that is storage in the basin greatly exceeds the amount of cumulative overdraft, rendering the project's contribution to this cumulative impacts less than cumulative considerable.
- Other Cumulative Impacts: For visual resources, the anticipated cumulative operational visual impacts of the GSEP in the Chuckwalla Valley are considered potentially significant from some sensitive viewpoints, particularly within the Chuckwalla Wilderness. Anticipated cumulative operational impacts of region-wide projects in the southern California desert are considered cumulatively considerable and potentially significant.
- Cumulative impacts to land use: approximately one million acres of land are proposed for solar and wind energy development in 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 land use impact.

The alternatives analysis focuses on the consideration of these impacts and the extent to which they could be reduced or eliminated with use of alternative sites or technologies.

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 environmental document, comment on the alternatives considered, and to identify issues that should be addressed in the environmental review. The discussion below presents the key issues identified from the written and oral comments received on the GSEP. The specific issues raised during the public scoping process that relate to Alternatives are summarized as follows:

- Suggestion to eliminate the western portion of the Genesis project near Palen Dry Lake ACEC (western portion of the Genesis project has not been included in the proposed GSEP design);
- Regarding groundwater impacts, the applicant's hydrologist makes the assertion that local wildlife waters are fed by a perched aquifer, and that since the project proposes
- Request that a dry cooling alternative be considered (See Section B.2.6.2);
- Project should be pulled back from dunes and other sensitive areas onsite, or preferably moved to an alternative site closer to existing disturbance and transmission (See Section B.2.7.2);
- Alternatives should include consideration of disturbed, private lands near the GSEP (Sufficient disturbed, private lands for a 250 MW solar power plant were not available near the GSEP, an alternative on disturbed, private lands elsewhere was considered. See Section B.2.7.2);
- Alternatives should not be tied to a specific Power Purchase Agreement that the applicant may have entered into (See Section B.2.6.1);
- Alternatives should consider using disturbed private lands, including land that is outside of BLM jurisdiction, and distributed generation (See Section B.2.7.2 and Section B.2.8.2);
- The AFC filed by NextEra fails to include a reasonable range of alternatives including the No Action Alternative and the reasonably foreseeable alternative of locating solar photovoltaic (PV) distributed generation (DG) near to load centers on brown-field sites (roof tops) where new transmission infrastructure may not be needed to connect these solar resources (See Section B.2.6.3 and Section B.2.8.2);
- Alternatives should be placed near existing transmission lines (The I-10 corridor is a designated utility corridor with existing and planned transmission lines);
- Private sites should not be rejected simply because they have numerous owners – there is no indication the level of effort the applicant put into acquiring private lands (See Section B.2.7.2);

- Agencies should compare the GSEP and its impacts with all other identified "fast-track" projects on BLM land in order to identify the least environmentally harmful projects among the applications that have been selected for expedited permitting;
- According the Energy Commission, only 128,000 acres maximum (both private and public) are needed to achieve the RPS goal so there is ample opportunity to consider species migration needs and patterns, established wildlife corridors and climate change implications on proposed project lands; and

Scoping comments are also listed in the **Summary of Comments** in the **Introduction** section of this SA/DEIS.

B.2.6 ALTERNATIVES EVALUATED UNDER NEPA AND CEQA

A number of scoping comments requested that the project be reconfigured or reduced in size to avoid sensitive resources and to consider technologies that would reduce impacts to water use. Scoping comments suggested including the disturbed lands in the vicinity of the project in the project footprint to make up for any loss in acreage. The scoping comments are addressed in the alternatives described herein and in the site alternative evaluated in Section B.2.7. This section describes three alternatives to the proposed project: the Reduced Acreage Alternative, the Dry Cooling Alternative, and the "No Project/No Action" Alternative. The alternatives are evaluated under both NEPA and CEQA in Section C (Environmental Analysis).

In addition, scoping comments identified the need for more comprehensive Land Use Plan Amendments that could further address minimizing the cumulative effects of large scale renewable projects along the I-10 Corridor. Proposed Land Use Plan Amendments are depicted in Appendix B and include consideration of those areas both inside and outside the project footprint that could be managed specifically for right away avoidance or exclusion areas, habitat conductivity and targeted acquisition areas that would function for compensatory mitigation for sensitive species.

B.2.6.1 Reduced Acreage Alternative

The Reduced Acreage Alternative would essentially be Unit 1 (or one-half) of the proposed project, including a 125 MW solar facility located within the boundaries of the proposed project as defined by NextEra. This alternative is analyzed for two major reasons: (1) it eliminates about 50 percent of the proposed project area so all impacts are reduced, and (2) by eliminating the eastern solar field, it would reduce the water required for wet cooling by 50 percent. The boundaries of the Reduced Acreage Alternative are shown in **Alternatives Figure 1**. As with the proposed GSEP, a land use plan amendment to the California Desert Conservation Area (CDCA) Plan of 1980 would be required before BLM could issue the ROW grant for the Reduced Acreage Alternative.

The Reduced Acreage Alternative would have a net generating capacity of approximately 125 MW and would occupy approximately 900 acres of land. This alternative would retain 50 percent of the proposed project's generating capacity, and would affect 50 percent of the land affected by the proposed project. Specifically, the alternative would retain the Unit 1 solar field, including the construction parking, construction trailers, and temporary construction laydown area; the administration

building and warehouse; the solar collector assembly area; the western evaporation pond area (approximately 24 acres); and the land farm area (approximately 10 acres). The alternative would require relocating the switchyard, from the Unit 2 power block to the Unit 1 power block. The eastern evaporation pond area (approximately 24 acres) that corresponds with Unit 2 would not be included in the Reduced Acreage Alternative. This area could be used for the relocated gas yard if needed.

Similar to the proposed project, the Reduced Acreage Alternative would transmit power to the grid through the Colorado River Substation. It would require infrastructure including groundwater wells, transmission line, road access, administration building, and evaporation ponds. The required infrastructure and transmission line for the Reduced Acreage Alternative would follow the routes defined for the proposed project, even though Unit 2 would not be constructed. The linear facilities would require approximately 90 acres. The gas pipeline would be approximately 1 mile longer than for the proposed project.

Dry cooling is being evaluated as an alternative to the proposed project, so could also be used with this configuration. However, if wet cooling were used, cooling would require approximately 822 acre-feet per year.

According to the applicant, independent studies have indicated a 250 MW size project hits an optimal size range where economies of scale and the potential for excess parasitic losses balance out and that there is no substantial environmental advantage to a smaller size project (GSEP 2009a). A detailed cost-benefit analysis for a reduced-size project would be required in order to determine the economic feasibility of this alternative. As a result, feasibility is uncertain at this time.

B.2.6.2 Dry Cooling Alternative

Description of the Process and Equipment Required

There are two types of dry cooling systems: direct dry cooling and the lesser used indirect dry cooling. In both systems, fans blow air over a radiator system to remove heat from the system via convective heat transfer (instead of once-through cooling or evaporative heat transfer). In the direct dry cooling system, also known as an air-cooled condenser (ACC), steam from the steam turbine exhausts directly to a manifold radiator system that rejects heat to the atmosphere, condensing the steam inside the radiator. Direct dry cooling is analyzed as the alternative to the wet cooling proposed by NextEra for the GSEP.

Dry cooling is the best choice of cooling technologies for a steam power plant to conserve water and minimize wastewater. However, this technology can create both environmental and economic concerns, depending on the location and specific situation. These concerns are evaluated for the GSEP site specifically in Sections C and D of this SA/DEIS. As with the proposed GSEP, a land use plan amendment to the California Desert Conservation Area (CDCA) Plan of 1980 would be required before BLM could issue the ROW grant for the Dry Cooling Alternative.

Advantages and Disadvantages of Dry Cooling

The following is a general list of the general advantages and disadvantages of dry cooling.

Advantages of Dry Cooling Systems

- Dry cooling allows a power plant location to be independent of a water source. It has essentially no water intake or water discharge requirements.
- Dry cooling minimizes the use of water treatment chemicals.
- Dry cooling minimizes the generation of liquid and solid wastes.
- Dry cooling does not generate visible plumes that are commonly associated with wet cooling towers.
- Dry cooling eliminates impacts to aquatic biological resources.
- Dry cooling eliminates the need for discharge permits.
- Dry cooling eliminates the need for disturbance of wetland/aquatic substrate habitat.

Disadvantages of Dry Cooling Systems

- Dry cooling requires air-cooled condensers that could have negative visual effects.
- Compared to once-through cooling, dry cooling requires the disturbance of a larger area for the air-cooled condensers than that required for cooling towers.
- Dry cooling can have noise impacts that are greater than once-through or wet cooling systems because of the number of fans and the considerably greater total airflow rate. New quieter fans and other mitigation measures are available to reduce these impacts.
- Using dry cooling, the power plant steam cycle efficiency and output can be slightly reduced, depending on site conditions and seasonal variations in ambient conditions. Also, extra power is needed to operate the cooling fans.
- Capital costs for building air-cooled condensers are generally higher than capital costs for once-through cooling.

Description of the Air Cooled Condensers

In order to compare the performance and impacts of a dry cooling system or ACC with that of the wet-cooled system, the operating conditions at a common design point must be established. The design and operation of an ACC are highly dependent upon the ambient conditions at a specific site.

Size, Configuration, and Layout

The size of an ACC is a function of the heat load from the steam turbine generator and the ambient conditions. The ACC is composed of tube bundles with fins attached to the tubes to enhance heat transfer to the air. These bundles are grouped together and mounted in an A-frame configuration on a steel support structure. These A-frame tube bundles are aligned in rows or bays. Steam is ducted directly from the steam turbine exhaust to the ACC where it enters in a parallel flow into the tubes across the top of the

bays. Air is blown from below across the finned tube bundles by a series of large fans, which are located beneath the A-frame tube bundles. Each fan is considered a module. To accommodate the large mass of air required for cooling the steam, the A-frame tube bundles are elevated on top of an open structure. As the steam passes down through the tube bundles, it is condensed and drains by gravity flow into a tank from which it is pumped back to the steam turbine. Since the steam is exhausted directly from the steam turbine generator after it has expanded through the turbine, it is at both a very low pressure and large volume. This condition limits the distance that the ACC can be located from the steam turbine generator, due to the drop in pressure that results during the transport of the steam; this limitation must be taken into consideration when configuring the plant layout.

Staff has not developed and analyzed detailed layouts for the ACC system. However, it is assumed that the ACC system would be located where the cooling towers are currently proposed. **Alternatives Figure 2** illustrates the approximate size and location of the ACC on the power block layout.

Approximately 18 ACC fans would be required for cooling each 125 MW power block when the ambient temperature is above 50 degrees Fahrenheit (GSEP 2009f). The 18 ACC fans described in the GSEP cooling study would have a length of approximately 279 feet, a width of approximately 127 feet, and a height of 98 feet (GSEP 2009f). However, based on the ACC preliminary designs for nearby solar thermal projects in similar ambient temperatures, an additional 11,690 square feet could be required for siting of the fans and the fans would be up to 120 feet in height. In addition to the ACC fans, NextEra would use a small Wet Surface Air Cooler when needed to provide auxiliary cooling during extremely hot days (GSEP 2009f). The proposed wet cooling towers and associated equipment occupy an area of about 420 feet long by 60 feet wide. While the ACCs would require about 40 to 50 percent more land area than the proposed wet cooling towers, from the site layout, it appears that such a system would fit in the approximate current location of the cooling tower as there is unused space between the power block and the solar collector assembly (GSEP 2009a). This unused space would have been previously graded as it is designed to be used for construction parking and construction trailers. An environmental assessment of the impacts of using dry-cooling instead of wet-cooling is presented in Sections C and D, for each resource element.

Economic Feasibility

As stated above, a NextEra project objective was to use a site that would allow wet cooling in order to optimize power generation efficiency and reduce project cost. Wet-cooling maximizes power plant fuel efficiency by providing a continuous source of effective cooling for the plant's steam condensers. Dry cooling will typically provide less effective cooling of the condensers, reducing the efficiency of the steam cycle portion of the power plant, and thus the overall fuel efficiency of the facility. The FSA for the Beacon Solar Energy Project (08-AFC-2; BSEP 2009) showed that annual average fuel efficiency would be reduced 5-7 percent compared to a wet cooling system. The applicant stated that use of dry cooling would result in a 7.4 percent decrease in total annual net MWh compared with a wet cooling system which NextEra considerers significant, since peak demand for the Project would be during the summer when ACC

performance is limited (GSEP 2009a). NextEra concludes that the use of dry cooling will decrease the project output, which will render the Project economically unsound or noncompetitive (GSEP 2009a).

The Genesis Solar Energy Project Cooling Study states that because of the brackish water being proposed for the site, the evaluated installed cost difference between wet and dry cooling was less than 1 percent (GSEP 2009f). As such, it is not the installation cost difference between wet and dry cooling that would render dry cooling economically unsound or noncompetitive but the decrease in total annual new MWh. Additionally, the cooling study estimates a decrease of annual net MWh when using dry cooling of 6.9 percent, as opposed to the 7.4 percent mentioned in the AFC by the applicant (GSEP 2009f).

When considering a dry cooling alternative in the Beacon Solar Energy Project FSA, the applicant proposed expanding the solar field by 12 percent to counter the reduction in generation that would result from dry cooling (BSEP 2009). The GSEP applicant also addresses an expanded solar field and states that the proposed project has been optimized for the land available, and a solar field expansion would be infeasible at this site (GSEP 2009a). However, the power block and solar arrays would occupy approximately 1,360 acres of the 1,800-acre site. Evaporation ponds, access roads, administration buildings, and other support facilities would require a portion of the 1,800-acre site, and there is also remaining open space (GSEP 2009a). A 12 percent increase in the GSEP solar field would require an additional 150 acres. While it is uncertain whether the entire 150 acres is available for use and would comply with the engineering requirements for GSEP, it is clear from the site plan that there is some available land immediately adjacent to existing solar trough rows and this land could be used to offset all or a portion of the efficiency loss due to the use of dry-cooling.

The FSA for the Beacon Solar Energy Project performed a detailed cost analysis for that project using dry cooling (BSEP 2009). In the FSA, it was found that the Beacon Solar Energy Project was economically feasible using dry cooling because it surpassed the benchmark internal rate of return established for economic feasibility. Furthermore, the Beacon Solar Energy Project was found to be economically feasible using dry cooling both with and without an expanded solar field (BSEP 2009). While not all circumstances of the Beacon Solar Energy Project and the GSEP are identical , the applicant has not shown sufficient evidence that the additional cost or lost profitability from incorporating dry cooling into the GSEP are sufficiently severe as to render dry cooling impracticable to proceed with the project.

This is further shown, as highlighted in the Beacon Solar Energy Project FSA, by the overall market (supply side) – the solar power plant development industry in California. The market was defined by the project using only solar thermal technologies with capacity of 50 megawatts or greater, constructed within the last 10 years in California or proposed to be built in California. Of the solar thermal projects being considered by the Energy Commission all but two were designed using dry cooling (air cooled condenser). This includes the three solar thermal projects in the same general area (climate) as the GSEP, which would have similar if not identical efficiency losses from using dry cooling. Because of this, dry cooling is considered potentially economically feasible and evaluated under both NEPA and CEQA in Section C (Environmental Analysis).

B.2.6.3 No Project/No Action Alternative

CEQA No Project Alternative

The No Project Alternative under CEQA defines the scenario that would exist if the proposed GSEP 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 GSEP would not occur. There would be no grading of the site, no loss of resources or disturbance 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 Riverside County and in the Mojave Desert as a whole.

In the absence of the GSEP, however, other power plants, both renewable and non-renewable, may have to be constructed to serve the demand for electricity and to meet the 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 GSEP. 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 California utilities would not receive the 250 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 Genesis Solar Energy 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 GSEP (250 MW), and to approve the project as proposed. The GSEP and ancillary facilities are approved, a ROW grant is issued, and the CDCA Plan is amended to include the GSEP 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 Dry Cooling Alternative or Reduced Acreage Alternative), 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 Genesis Solar Energy Project application and on CDCA land use plan amendment**. The Genesis Solar Energy 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.
- **No Action on Genesis Solar Energy Project application and amend the CDCA land use plan to make the area available for future solar development.** The Genesis Solar Energy 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 Genesis Solar Energy Project and amend the CDCA land use plan to make the area unavailable for future solar development.** The Genesis Solar Energy Project is not approved (project denied), and no ROW grant is issued to Genesis, LLC and the CDCA plan is amended to make the project area unavailable for large scale renewable energy development.

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

B.2.7 CEQA-ONLY ALTERNATIVE RETAINED

One site alternative is evaluated by the Energy Commission under CEQA only. The alternative site evaluated in this section (the Gabrych Alternative) is located on private land. BLM has determined that it would be inconsistent with its purpose and need for the action under consideration or would otherwise be unreasonable. Under NEPA reasonable alternatives are dictated by the nature and scope of the proposed action and are defined by the purpose and need. Because the offsite alternative would not be within BLM jurisdiction, BLM would have no discretionary approval authority for this alternative.

The Energy Commission does not have the authority to approve an alternative or require NextEra 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 effects of the project. Implementation of an alternative site would require that the applicant submit a new Application for Certification (AFC), including revised engineering and environmental analysis. 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 would require substantial additional time.

No specific alternative site for the GSEP was suggested in scoping comments; however, a number of commenters requested that alternatives on disturbed private lands be considered.

B.2.7.1 Site Selection Criteria for the Retained CEQA Alternative

The following site selection criteria identified in the GSEP AFC were used to choose the proposed site (GSEP 2009a):

- The site must receive insolation of no less than 7.0 kilowatt-hours per square meter per day (kWh/m^2/day).
- The site must be large enough (at least 1,800 contiguous acres) to support a 250-MW plant and arranged in a way that allows an efficient and cost-effective layout.
- The site needs to be relatively flat, with a slope of three percent or less.
- To be economically viable, the site should be located on property currently available at a reasonable cost, have reasonable proximity to infrastructure, and have good solar resources. Sites with excellent solar resources may be able to carry somewhat higher mitigation costs or infrastructure costs.
- The site needs to be located so it can be interconnected with an existing transmission system without the need for new, long dedicated transmission lines, while also providing good access to water for power plant cooling. The site also needs reasonable access to a natural gas pipeline.
- The land for the power plant site and linear facilities has to be available for purchase or lease.

A number of scoping comments included the criteria list for areas to avoid in siting renewable projects defined by Audubon California and other groups:

- 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 HCP and NCCP 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 Historic Register eligible sites and other known cultural resources;
- Locations directly adjacent to National or State Park units.

It is noted also that 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 resulted in identification of the proposed site, and in fact reflected many of the suggested criteria for siting presented by Audubon California noted above. As a result of the pre-application activity and the scoping and public comment process, the alternative site considered in this SA/DEIS was 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 in California. The BLM processes solar energy right-of-way 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, a site with an active pending application is not considered to be a reasonable alternative to a proposed project, such as GSEP. This is because selection and approval of a site with an active pending application in lieu of the proposed project cannot be assured, given the precedence of the first application. If BLM were to consider the site with an active pending application 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 is given priority in consideration for that site location. Unless and until the active pending application is eliminated from consideration, BLM would not approve the site with the active pending application over the proposed project. 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 Department of Energy (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 the 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 should be published in 2010; the appropriateness of siting solar energy plants on various land use designations may be revisited in the PEIS.

California Governor Executive Order S-14-08 requires the Renewable Energy Action Team to establish a Desert Renewable Energy Conservation Plan (DRECP) for the Mojave and Colorado Desert regions. The Planning Agreement regarding the DRECP was entered into by the Energy Commission, California Department of Fish and Game, BLM, and U.S. Fish and Wildlife Service and is charged with identifying areas suitable for renewable energy project development and areas that will contribute to the

conservation of sensitive species and natural communities. A draft report is currently being drafted.

Design of the Proposed Project

The proposed project (Genesis Solar Energy Project) is a nominal 250 MW solar plant located on approximately 1,800 acres. The project is divided into two independent concentrated solar electric generating facilities, where the two power blocks and solar fields would each be located on approximately 680 acres and would create 125 MW of solar energy. Additional acreage would be required for evaporation ponds, access roads, administration buildings, other support facilities, and land treatment units (NextEra 2009a). This layout defines the area required for an alternative site.

B.2.7.2 Gabrych Alternative

The proposed GSEP is described above. Scoping comments requested that an alternative site on disturbed land be considered, thereby lessening the potential impacts to the desert environment. Commenters also noted that disturbed agriculture lands occur in the vicinity of the project and should be considered as possible alternatives.

The applicant stated that three private land sites were considered in the Blythe area (GSEP 2009f). The applicant did not pursue any of these alternatives because of concerns that any water use in the Blythe area would impact the Colorado River water basin (GSEP 2009f). Of the three alternatives considered by the applicant, the Gabrych site is considered here because (a) it seemed to have the best potential to reduce impacts to biological and cultural resources and (b) it was not already considered as an alternative to a different solar project.

The Gabrych Alternative site is located along Neighbors Boulevard just south of the Riverside/Imperial County line, and approximately 12 miles south of I-10. The Gabrych Alternative is located on ten parcels of private land making up 1,800 acres of land and would avoid the Harvey's Fishing Hole community, adjacent to the Colorado River. The Gabrych Alternative is shown in **Alternative Figure 3**.

The Gabrych Alternative would be within the Colorado Desert with appropriate slope and solarity requirements. The elevation of the site is between 200 and 250 feet above sea level. The site would be accessed via Neighbors Boulevard off the I-10. A small rural community, Harvey's Fishing Hole, would be located just south of the solar field but would be avoided by the project. A small sand/gravel mining operation occurs just west of the residential area and would also be avoided by the solar project. The Gabrych Alternative is defined as a project that would incorporate dry cooling, reducing the amount of water needed for the project to 66 AFY (GSEP 2009f).

The Gabrych Alternative sites would be made up of approximately 10 unique parcels with one land owner. 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. Additionally, the Gabrych Alternative site was identified by the Final Phase 2a Report as disturbed land that would support renewable energy development. However, the Gabrych parcels support agricultural operations.

Transmission Interconnection. The nearest designated transmission ROW is located approximately 5 miles west of the Gabrych Alternative site. The transmission interconnection would head west five miles, crossing agricultural lands, to reach a BLM CDD designated utility corridor. At this point, the transmission interconnection would turn north for approximately ten miles until reaching the proposed Colorado Substation. The transmission interconnection would be adjacent to a WAPA 161 kV line for most of the route.

Environmental and Engineering Assessment of the Gabrych Alternative

Air Quality

Environmental Setting. The Gabrych Alternative would be located in the Salton Sea Air Basin (SSAB) under the jurisdiction of the Imperial County Air Pollution Control District (ICAPCD). The Imperial County portion of the SSAB is designated as non-attainment for the federal and state ozone standards, the federal PM10 standard, and the state PM10 standard. This area is designated as attainment or unclassified for the state and federal CO, NOx, SOx, and PM2.5 standards. The entire SSAB is classified as attainment for the federal standard and unclassified for the state standards. This divergence in PM10 and PM2.5 attainment status indicates that a substantial fraction of the ambient particulate matter levels are most likely due to localized fugitive dust sources, such as vehicle travel on unpaved roads, agricultural operations, or wind-blown dust. The Gabrych Alternative is surrounded primarily by agricultural operations.

Environmental Impacts. Exhaust emissions from heavy-duty diesel and gasoline-powered construction equipment and fugitive particulate matter (dust) 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). Workers and trucks hauling equipment and supplies would have to commute approximately 12 miles north (from Blythe) to reach the Gabrych Alternative. The proposed project is located approximately 20 miles west of Blythe. Appropriate mitigation at the Gabrych 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. However, as the Gabrych Alternative is located in Imperial County, it would be required to comply with the existing District rules and regulations and the applicable Imperial County air quality plans.

As with the proposed GSEP, the Gabrych Alternative would emit some GHG emissions. However, the contribution of the project if built at the Gabrych Alternative to the system build-out of renewable resources to meet the goals of the Renewable Portfolio Standard (RPS) in California would result in a net cumulative reduction of energy generation and GHG emissions from new and existing fossil-fired electricity resources. Electricity is produced by operation of inter-connected generation resources. Operation of one power plant, like GSEP, affects all other power plants in the interconnected system. The operation of the GSEP at the Gabrych Alternative site would affect the overall electricity system operation and GHG emissions in several ways:

- Gabrych Alternative would provide low-GHG, renewable generation.

- Gabrych Alternative would facilitate to some degree the replacement of high GHG emitting (e.g., out-of-state coal) electricity generation that must be phased out to meet the State's 2006 Emissions Performance Standard.
- Gabrych Alternative could facilitate to some extent the replacement of generation provided by aging fossil-fired power plants that use once-through cooling.

These system impacts would result in a net reduction in GHG emissions across the electricity system providing energy and capacity to California. Thus, as with the proposed GSEP, the Gabrych Alternative would result in a cumulative overall reduction in GHG emissions from power plants, does not worsen current conditions, and would not result in impacts that are cumulatively CEQA significant.

Comparison to Proposed Project. The construction and operational emissions at the Gabrych Alternative site would be similar to those of the GSEP at the proposed site.

Biological Resources

Environmental Setting. The Gabrych Alternative site 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] 2010). The Gabrych Alternative is located in the Palo Verde Valley, east of the Palo Verde Mesa and the City of Palo Verde, immediately north and west of the Colorado River.

The Colorado Desert is the western extension of the Sonoran desert, which covers southern Arizona and northwestern Mexico. Much of the Colorado Desert 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 2010).

The Colorado Desert supports a diverse array of plant and animal species including the Yuma antelope ground squirrel (*Ammospermophilus harrisii*), white-winged dove (*Zenaida asiatica*), muskrat (*Ondatra zibethicus*), southern mule deer (*Odocoileus hemionus fuliginata*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), and raccoon (*Procyon lotor*). Rare animals include desert pupfish (*Cyprinodon macularius*), flat-tailed horned lizard (*Phrynosoma mcallii*), Andrew's dune scarab beetle (*Pseudocotalpa andrewsi*), Coachella Valley fringe-toed lizard (*Uma inornata*), Le Conte's thrasher (*Toxostoma lecontei*), and California leaf-nosed bat (*Macrotus californicus*). Rare plants include Orcutt's woody aster (*Xylorhiza orcuttii*), Orocopia sage (*Salvia greatae*), foxtail cactus (*Coryphantha alversonii*), Coachella Valley milk-vetch (*Astragalus lentiginosus* var. *coachellae*), and crown of thorns (*Euphorbia* sp.; CERES 2010).

A reconnaissance field survey of the Gabrych Alternative was conducted in January 2010. Because the Gabrych Alternative is located on private land, the survey was limited to public access points. While detailed vegetation mapping was not conducted for the Gabrych Alternative site, vegetation polygons were sketched based on what could be seen from public access points in the field as well as aerial photograph interpretation. These polygons were then digitized using a Geographic Information

System (GIS), thereby providing a rough estimate of the total acreage for each vegetation community on the Gabrych Alternative site. This mapping and the acreages derived from it are extremely preliminary (reconnaissance level) and should be used only to provide a generalized understanding of the amount and types of vegetation present. A full vegetation mapping effort would be required to provide more accurate maps and figures.

The Gabrych Alternative site consists mainly of active agricultural fields and active sheep grazing. Neighbors Boulevard traverses the central portion of the site from north to south, and several unnamed dirt roads cross the site between agricultural fields. Five named irrigation canals cross the site: C Canal, D-23-1 Canal, D-23-1-3 Canal, D-23-1-4 Canal, and D-23-1-5 Canal. Several residences occur in a concentrated area at the southern end of Neighbors Boulevard, adjacent to the river. These residences and the surrounding areas would be avoided by the alternative. A small sand/gravel mining operation occurs just west of the residential area.

Approximately 160 acres of the site support native vegetation communities; these parcels occur primarily in the southwest corner of the site. Surrounding lands include the Colorado River to the east and south, and active agriculture to the west and north. Cibola National Wildlife Refuge is located approximately three miles south of the site, in Arizona. Topography on site is relatively flat, with elevation ranging from approximately 235 to 245 feet above mean sea level (AMSL). There are nine soil series mapped for this alternative: Cibola, Gilman, Glenbar, Holtville, Imperial, Indio, Meloland, Ripley, and Rositas, much of which prime farmland (Soil Survey Staff 2009).

Approximately 7 acres of the Colorado River occur within the southern portion of the site, and is jurisdictional to the ACOE and CDFG. As with the residences in the southern portion of the site, the Colorado River would be avoided by the alternative layout. A small stand of riparian scrub occurring along the D-23-1-3 Canal in the northeast portion of the site, as well as more extensive riparian habitat occurring along the C Canal in the southwestern portion of the site and along the Colorado River in the southern portion of the site would be considered waters of the state under the jurisdiction of the CDFG and may be considered waters of the U.S. under the jurisdiction of the ACOE. Areas of arrowweed scrub occurring in the southwestern corner of the site also would be considered waters of the state under the jurisdiction of the CDFG and may be considered waters of the U.S. under the jurisdiction of the ACOE. The named on-site canals may be considered connected to the Colorado River and as such are potentially jurisdictional to the ACOE and CDFG. A jurisdictional delineation and coordination with the ACOE and CDFG would be necessary to formally determine the jurisdictional areas on site.

Wildlife Use. Undeveloped portions of the site (the southwest corner) are used by a variety of common animal species such as coyote (*Canis latrans*), black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus bachmani*), raccoon (*Procyon lotor*), and various resident and migratory bird species such as American kestrel (*Falco sparverius*), Gambel's quail (*Callipepla gambelii*), white-crowned sparrow (*Zonotrichia leucophrys*), sage sparrow (*Amphispiza belli*), Say's phoebe (*Sayornis saya*), and black phoebe (*Sayornis nigricans*), as well as the desert kangaroo rat (*Dipodomys deserti*). Agricultural areas on site support foraging habitat for red-tailed hawk (*Buteo*

jamaicensis), northern harrier (*Circus cyaneus*), turkey vulture (*Cathartes aura*), American kestrel, and phoebes. The canals carrying water support potential foraging habitat for species such as the belted kingfisher (*Ceryle alcyon*) and white-faced ibis (*Plegadis chihi*).

Although the site itself does not function as a movement corridor for wildlife, the adjacent Colorado River and contiguous undeveloped lands (where present) do provide corridor functions for several species.

Vegetation Communities. Active agriculture, riparian scrub, arrowweed scrub, desert saltbush scrub (including disturbed), disturbed habitat, and developed land are the six primary vegetation communities on the alternative site. The acreages presented below are rough estimates, as detailed vegetation mapping was not conducted.

Active and fallow agriculture (including crops and sheep grazing) occurs on approximately 1,817 acres (approximately 85 percent) of this alternative site. The edges of the fields consist of low dirt berms supporting sparse non-native plant cover, including crabgrass (*Digitaria* sp.), London rocket (*Sisymbrium irio*), and nettleleaf goosefoot (*Chenopodium murale*). The active and previously farmed areas would be included in the alternative solar fields.

Riparian scrub occurs on approximately 38 acres, almost all of which is adjacent to the river in the southern portion of the site and along the C Canal where it traverses disturbed saltbush scrub in the southwest corner of the site. This habitat is comprised of a mix of black willow (*Salix gooddingii*), arrowweed (*Pluchea sericea*), and tamarisk (*Tamarix* sp.), along with presence of cattails (*Typha* sp.) in the wetter areas, and occasional horsetail (*Equisetum* sp.). This area would be avoided by the solar field arrays.

Arrowweed scrub occurs on approximately 82 acres in the south and southwestern portions of the site. This habitat consists primarily of arrowweed, with some areas supporting a mix of arrowweed, tamarisk, four-wing saltbush (*Atriplex canescens*), and other saltbush species (*Atriplex* spp.). This area would be avoided by the solar field arrays.

Desert saltbush scrub occurs on approximately 35 acres, consisting of approximately nine acres of undisturbed desert saltbush scrub and 26 acres of disturbed desert saltbush scrub located in the southwestern corner of the site. Undisturbed desert saltbush scrub consists of habitat with moderate to dense coverage by saltbush (*Atriplex* spp.), while disturbed saltbush scrub consists primarily of old alluvial deposits that appear to have been cleared of vegetation in the past and are still recovering. Shrub cover in these disturbed areas is approximately five to ten percent, comprised of various species of saltbush, as well as occasional creosote bush (*Larrea tridentata*) and arrowweed, while herbaceous cover is approximately 35 to 45 percent, consisting primarily of Mediterranean grass (*Schismus barbatus*) with occasional plicate coldenia (*Tiquilia plicata*) and Russian thistle (*Salsola tragus*).

Disturbed habitat comprises approximately 126 acres of land in the southwestern corner of the site that has been cleared of vegetation and supports sparse coverage by non-

native species, as well as areas west of the residential area, including areas formerly used for camping and illegal dumping. This area would be avoided by the solar field arrays.

Developed land comprises approximately 34 acres at the southern terminus of Neighbors Boulevard, comprising approximately 26 acres of residential development and eight acres of ongoing sand/gravel mining along the north side of the river. This area would be avoided by the solar field arrays.

Special Status Species Special status species observations have been reported to the CNDDB within five miles of the alternative site (Table 2). These CNDDB records include two non-listed, special status plant species, bitter hymenoxys (*Hymenoxys odorata*) and Wiggins cholla (*Cylindropuntia wigginsii*), three listed animal species, federally and state listed endangered razorback sucker (*Xyrauchen texanus*), federally endangered and state threatened Yuma clapper rail (*Rallus longirostris yumanensis*), and federal candidate and state endangered western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), as well as eight non-listed special status animal species, Couch's spadefoot (*Scaphiopus couchii*), vermillion flycatcher (*Pyrocephalus rubinus*), Yuma myotis (*Myotis yumanensis*), Townsend's big-eared bat (*Corynorhinus townsendii*), pallid bat (*Antrozous pallidus*), American badger (*Taxidea taxus*), and Colorado River cotton rat (*Sigmodon arizonae plenus*).

Alternatives Table 2 California Natural Diversity Database Records for Special Status Species within Five Miles of the Gabrych Alternative Site

Common Name ***Scientific Name***	**Status State/Fed/CNPS/BLM**	**Occurrence Within 5 Miles of Gabrych Alternative Site**
PLANTS		
Bitter hymenoxys *(Hymenoxys odorata)*	--/--/List 2/--	Reported approximately 2.5 miles west of the site.
Wiggins cholla *(Cylindropuntia wigginsii)*	--/--/List 3.3/--	Reported approximately 2.5 miles west of the site.
Razorback sucker *(Xyrauchen texanus)*	SE/FE/--/--	Reported approximately 1 mile southwest of the site and 2.5 miles west of the site.
Couch's spadefoot *(Scaphiopus couchii)*	SSC/--/--/S	Reported approximately 2.5 miles west of the site.
Yuma clapper rail *(Rallus longirostris yumanensis)*	ST/FE/--/--	Reported approximately 2 miles southwest of the site in a natural meander of the Colorado River, west of the channelized river.
Western yellow-billed cuckoo *(Coccyzus americanus occidentalis)*	SE/FC/--/--	Reported along the eastern edge of the site, in riparian habitat associated with the river.
Vermillion flycatcher (*Pyrocephalus rubinus*)	SSC/--/--/--	Reported approximately 2.5 miles west of the site.

Common Name *Scientific Name*	Status State/Fed/CNPS/BLM	Occurrence Within 5 Miles of Gabrych Alternative Site
Yuma myotis (*Myotis yumanensis*)	--/--/--/S	Reported along the southern boundary of the site, where Neighbors Boulevard crosses the river.
Townsend's big-eared bat (*Corynorhinus townsendii*)	SSC/--/--/S	Reported approximately 2.5 miles west of the site.
Pallid bat (*Antrozous pallidus*)	SSC/--/--/S	Reported approximately 2.5 miles west of the site.
American badger (*Taxidea taxus*)	SSC/--/--/--	Reported approximately 2.5 miles west of the site.
Colorado River cotton rat (*Sigmodon arizonae plenus*)	SSC/--/--/--	Reported approximately 2.5 miles west of the site.

Status Codes (Source: CDFG 2009**):**

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

State SE - State listed endangered
ST = State listed threatened
SSC = Species of special concern

California Native Plant Society (CNPS)
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)

U.S. Bureau of Land Management (BLM)
S **=** Sensitive
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>

Northern harrier was the only special status species observed on the alternative site during the field reconnaissance. There are other special status plant and animal species with potential to occur on the alternative site (Appendix A), but the primary species of concern are the desert tortoise and burrowing owl. The desert tortoise is unlikely to occur on the alternative site as native habitat is limited and is isolated from other potential habitat areas. Special status species most likely to use the site are species associated with foraging in agricultural fields (e.g., burrowing owl), and bird species associated with riparian habitat along the river. There is moderate potential for burrowing owl to use the site for foraging; owls also may inhabit burrows in berms constructed along irrigation canals, though no burrows were observed during the field reconnaissance.

NECO Habitat Management Areas. The Gabrych Alternative occurs just outside of the NECO planning area and does not occur within or adjacent to any NECO Wildlife Habitat Management Area (WHMA; BLM and CDFG 2002).

Landforms. The Gabrych Alternative is located just southeast of the NECO planning area. The nearest NECO landforms are cultivated lands, as shown on Map 3-4 of the NECO (BLM and CDFG 2002).

Critical Habitat. No critical habitat for special status plant or animal species occurs on or adjacent to the Gabrych Alternative. The site is located just southeast of the NECO planning area; the NECO Desert Tortoise Habitat Model (BLM and CDFG 2002) shows low quality desert tortoise habitat (potential value of 0) adjacent to the site.

Environmental Impacts

Construction. It is expected that the facility could be sited on the least sensitive 1,800 acres of the 2,137-acre Gabrych Alternative site. All riparian areas and native vegetation communities in the southwestern corner of the site could be avoided. Potential impacts may still occur to canals, depending on the site design, which may result in impacts to waters of the State and/or waters of the U.S.

It is unlikely that any special status plant species occur on site, and if so, they could be avoided by constructing the facility outside of the native vegetation areas in the southwestern corner of the alternative. Few impacts to special status animal species would be expected because the alternative site is largely active agricultural land and native habitat along the river and in the southwestern corner could be avoided while still having the minimum 1,800 acres needed for facility construction. However, a northern harrier was observed foraging on site, and burrowing owl, which is known to use agricultural land for foraging, also may be affected if it is present.

Two special status species documented in CNDDB records could be affected if riparian habitat along the river and in the southwestern corner is impacted. These include western yellow-billed cuckoo and Colorado River cotton rat. Impacts to razorback sucker are not anticipated as this species inhabits the Colorado River and is not expected to occur on site. Several species of bats may forage along the river, but are not anticipated to be affected by facility construction. There is also some potential for special status plant species to occur in the native habitat areas in the southwestern corner. These include Harwood's milk-vetch, desert unicorn plant, Abrams spurge, and dwarf germander.

Wildlife movement across the site would be impeded by project development but would not affect overall wildlife movement in the area, as movement is likely to be concentrated along the river corridor.

Additional impacts to vegetation communities, and possibly special status species, would occur due to the construction of linear facilities (e.g., transmission lines) associated with a solar project on the alternative site. However, the transmission interconnection would traverse agriculture lands before reaching the CDD Designated Utility Corridor, so impacts caused by the transmission interconnection are expected to be reduced.

General Construction Impacts to Wildlife. Any wildlife residing on the Gabrych Alternative 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.

Migratory/Special Status Bird Species Impacts. The Gabrych Alternative site provides foraging, cover, and/or breeding habitat for migratory birds. Project construction could impact nesting birds in violation of the Migratory Bird Treaty Act.

Spread of Noxious Weeds. Construction of a solar project at the Gabrych Alternative site could result in the introduction and/or 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.

Excessive Noise. Noise from construction activities on the Gabrych Alternative site 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 activities could reduce the reproductive success of nesting birds.

Operational Impacts. Operation of transmission lines associated with a solar project on the alternative site could result in increased avian mortality due to collision with the new transmission lines.

An increased incidence of accidental wildfire is also a possibility during operation (although the potential is low) from downed transmission lines. Additionally, there would be the potential for edge effects to special status animal species in surrounding habitat areas from operational night lighting or noise. Furthermore, the desert tortoise could be subjected to increased predation from common ravens (*Corvus corax*; observed during the reconnaissance on alternative site), which may increase in numbers along the transmission interconnection where desert tortoise habitat is present.

Comparison to Proposed Project. Definitive conclusions about the amount of potential adverse impacts to biological resources in the absence of site-specific survey and project design information for the Gabrych Alternative site cannot be made. However, provided that riparian and other native habitat areas on the Gabrych Alternative site could be avoided, development of a solar project at the Gabrych Alternative site would impact fewer biological resources compared to the GSEP footprint because development of the alternative site would occur primarily on agricultural land, whereas development of the Proposed Project site would occur primarily on land supporting native vegetation communities.

Furthermore, while a number of special status plant and animal species have been reported to the CNDDB within five miles of the Gabrych Alternative site, these are primarily associated with the Colorado River as well as riparian areas east of the City of Palo Verde. Burrowing owl, loggerhead shrike, and northern harrier are the special status species most likely to be affected if the agricultural lands were developed. The Proposed Project footprint also may support these same species, in addition to supporting special status plant species (Wiggins' cholla, Harwood's milk-vetch, and desert unicorn plant) and other special status animal species (desert tortoise and kit fox). Due to its location within a larger expanse of native habitat, which also connects to the Palen/McCoy Wilderness Area, the GSEP site has greater potential to support a variety of special status species, such as the American badger and wild burro, which

are not expected to occur on the Gabrych Alternative site. If riparian and native habitats were avoided, development of a solar project on the Gabrych Alternative site would have fewer impacts to biological resources than development of a solar project on the Proposed Project site.

Cultural Resources

Environmental Setting. The Gabrych Alternative is located on agricultural land in Imperial County, California. The alternative site is located in the southern end of the Palo Verde Valley, on Holocene floodplain sediments along the west side of the lower Colorado River. The Valley is bordered by the Palo Verde Mesa to the northwest and west, which are Pleistocene Colorado River terraces partially covered with alluvial cobble pavements used by prehistoric inhabitants for toolstone. The Cibola Valley is south and the Triago Mountains are to the east of the alternative. The proposed Project is located approximately 25 miles northwest of the Gabrych Alternative, north of Interstate 10 midway between Blythe and Desert Center near Ford Lake.

The Palo Verde Valley is part of the northern extent of the Colorado Desert, subdivision of the greater Sonoran Desert. Conditions within the Colorado Desert are among the hottest in the United States. Annual rainfall totals within the Colorado Desert are among the lowest in the greater Sonoran Desert, averaging less than 2 inches (5 cm) per year in the Salton Trough and between 2 to 4 inches (5-10 cm) along the Colorado River (Crosswhite and Crosswhite 1982).

The Colorado River is the only perennial source water near the Gabrych Alternative area, which is one of the major river systems of North America. Springs in the area are very rare and tend to flow seasonally. West of the project area, in the McCoy Mountains, is the McCoy Spring. McCarthy (1993) identified a “halo” type settlement pattern around these perennial waters sources, where site density and complexity are much higher near the permanent water sources. The alternative area, prior to the construction of Boulder Dam, was susceptible to seasonal flooding, which left temporary lakes and a marsh environment (McDonald and Schafer 1998).

The prehistoric use of the Colorado Desert was apparently episodic, with long periods of low-intensity use of the land during particularly arid times. The earliest inhabitants of the region were highly mobile hunter-gatherers exploiting a variety of plants and animals. The settlement patterns of these Late Pleistocene and Early Holocene inhabitants suggest that they preferred to live along the shores of prehistoric lakes and on mesas near perennial washes (Schaefer and Laylander 2007). Roughly 7,000 years ago, local pluvial lakes began to evaporate and settlement shifted to the Colorado River and to perennial springs in the mountains and valley floors.

A number of ethnographically documented culture groups are associated with the Palo Verde Valley through historic use and oral history. These include the Mohave, Halchidhoma, Quechan, and Chemehuevi, along the lower Colorado River, and the Cahuilla of the western deserts and mountains (Bean 1972; Bean and King 1974; Bean and Vane 1978; Fowler and Fowler 1971; Laird 1976; Rogers 1939, 1966; Schaefer 2003; Singer 1984), collectively referred to as Yuman. The stretch of the Colorado River immediately adjacent to the alternative area was notably contentious, changing hands more than once in the Protohistoric period. Hostilities ended with Gold Rush and

establishment of Fort Yuma and Mojave in the middle of the 19th century. The final conflict occurred in 1860, when the U.S. Army defeated the Mohave (Sherer 1994)

The west side of the Colorado River was also an important corridor for travel between southern and northern river groups, particularly the Quechan and Mohave. North-south running trails have been identified along the river as transportation routes as well as ceremonial ways linking key mountains, springs, and other landscape features (Stone 1981; Woods 1986). These prehistoric trails and important landscape features are frequently associated with rock and earth art, as well as small rock piles known as cairns. As well, trails headed west as part of a long-distance transportation corridor from the Colorado River to Lake Cahuilla and the Pacific Coast (Bean and Vane 1978, Davis 1961, King 1981, Sample 1950, Singer 1984).

Subsistence patterns of Yuman cultural groups were mixed, consisting of both small-scale agriculture supplemented by foraging, fishing and hunting. Agricultural strategies optimized the use of flood waters as means of providing moisture to the fields; seeds were dispersed after floodwaters receded. Cultivated crops included maize, beans, squash, melon and semi-wild grasses (McDonald and Schafer 1998).

The first documented exploration of the Colorado Desert by non-indigenous people occurred in the 16th century, but sustained Euro-American settlement of the region did not occur until the mid-19th century. The first recorded exploration of the interior Colorado Desert region was undertaken by Father Eusebio Francisco Kino, a Jesuit missionary, cartographer, and explorer. Starting in 1691, Kino established a string of missions in northern Mexico and southern Arizona, finally reaching the Colorado River in 1702.

The first Americans to arrive in the Colorado Desert in any numbers were prospectors hunting for the next big gold strike (Rice et al. 1996; Morton 1977). Sustained economic development in the Colorado Desert region only began in the 1870s, and came to fruition in the early part of the 20th century. Development was dependent largely on two things: transportation and water. The first of these came in 1872, with the construction of the Southern Pacific Railroad from the ocean to the eastern edge California. The railroad was the single most important boost to mining in the southeastern Colorado Desert, offering convenient transportation of heavy mining equipment, supplies, and personnel.

Agriculture became an important industry, second only to mining, by the late 1850s. To transform arid land into productive farming and grazing lands, water was the fundamental key. Agriculture became an important industry in the Palo Verde Valley near Blythe during the early 20th century, based largely on diverting water from the Colorado River. Agriculture continues to be a significant contributor to the Blythe economy.

A records search for the alternative area, at the Eastern Information Center and the South Coastal Information Center of the California Historical Information System reveals that the alternative, which is located in Palo Verde Valley, has a very low frequency of documented sites because less than two percent of the alternative has been systematically surveyed. The records and literature search identified five studies within

a one-mile radius of the project alternative, all of which are within or immediately adjacent to the alternative. These studies identified two built environment resources and one archaeological resource. The archaeological resource is a trail that was identified in historical documents, but has never been field checked. The built environment resources are canals, one of which transects the project area (P13-008401; Canal C).

Nearly 90 percent of the Gabrych Alternative has been disturbed by on-going agricultural activities since the 1930's, in addition to the construction of canals, roads, and OHV activity. While much of the surface prehistoric archaeology has been impacted, a review of the literature suggests that the potential for prehistoric sites within such close proximity to the Colorado River is moderately high. However, intact sites are likely buried and would not be identified through surface inventory.

Environmental Impacts. The construction and operation of a solar facility on the Gabrych Alternative may have impacts on buried sites or built environment resources eligible for the National Register of Historic Places (NRHP) or California Register of Historic Resources (CRHR). The majority of the 2,138 acre project APE is currently under cultivation or has been impacted by irrigation or other agricultural infrastructure. Analysis of aerial photographs (USDA 1939, 1953) shows that the area has been under cultivation since before 1953 and after 1939. Depth of agricultural disturbance likely varies between two and three feet. Approximately 233 acres of the project does remain relatively undisturbed, except for OHV, irrigation, and two-track impact. The likelihood of cultural resources present in this area, located within the western third of the project APE is moderate. Surface contours and aerial photos suggest that this area may have been a small back-water or cut-off channel, now in-filled, which contained flowing water in 1939 and may have contained a rich array of floral and faunal resources. The possibility of such an environment with greater resource density implies a higher potential for significant archaeological prehistoric sites.

In prehistoric times, the Colorado River Floodplain habitat would have been particularly attractive to Native American groups due to the proximity of water. The local flood plain would have provided access to fertile agricultural lands ideal for small-scale agriculture. The river itself contains fish and attracts wildlife that would have provided a consistent food source. Also, because of increased soil moisture, plant resources would have been more diverse and dense than the surrounding deserts. These factors would have provided an attractive area for human populations; therefore, it is likely that settlements in the alternative area were more permanent and larger than the deserts around the Blythe area.

Sediments within the alternative area are of recent alluvial origin deposited by over-bank events of the Lower Colorado River. Without in-field analysis, it is difficult to assume the age and structure of the surface sediments; however, comparison with sedimentation models (Waters 1992) for large river flood plains suggests that vertical accretion of sediments within the alternative area would be rather rapid suggesting high potential for buried prehistoric sites. Further, depositional energy in such settings is low, especially with increasing distance from the channel, and therefore the potential for intact subsurface sites would be high. The potential for buried archaeological prehistoric sites at the Gabrych Alternative, therefore, is high and any ground disturbing activities

below the depth of agricultural disturbance could disturb significant archaeological deposits.

Built environment resources in the alternative area consist of irrigation works, specifically a drainage canal (P13-008401), several residences or farms, and plowed fields. The drainage canal, also named Canal C, transects the western quarter of the alternative area. According to an aerial photograph (USDA 1939) portions of the canal were built prior to 1939. Later, as observed on a 1953 aerial photograph, the canal was extended to a small lake south of the alternative area. Between 1939 and 1953 a second canal, D-21-1, which appears to be a spur or feeder to Canal C, was constructed and supplies water to the southern and eastern portion of the alternative area. Other canals constructed prior to 1953may be present; however, it is difficult to discern from the aerial photographs. Two residences appear to have been built after 1939 (USDA 1939) showing up on the 1953 aerial photograph and the 1975 Palo Verde, CA 7.5' USGS quadrangle. In the late 1930's, the entire alternative area was in its natural state. By 1953, about one-third of the alternative area had been cleared for agriculture, mostly in the central and southeastern portions of the alternative area.

One prehistoric site was identified in the records search area. CA-IMP-877 is a historical period Indian trail. The site location was taken from a mid-1800's GLO map; however, the exact location is not known and its assumed location is near the western edge of the alternative area. Due to agricultural activity of the 20th century, it is likely that the site is no longer extant. No other prehistoric sites have been recorded in the area.

Comparison to Proposed Project. The development of a solar facility on the Gabrych Alternative would likely have fewer impacts than those of the Proposed Project near Ford Lake. The cultural resources survey of the Proposed Project found 21 archaeological sites (5 historic, 15 prehistoric, and 1 multicompenent) and two built environment sites within the project APE. Of the 21 sites, two (CA-RIV-9072 and CA-RIV-9224/H) are potentially eligible for inclusion on the National Register of Historic Places. Additional analysis of built resources of the canals and agricultural residences may find that these resources are eligible for inclusion on the CRHP and NRHP. Geoarchaeological studies of the Proposed Project indicate that the entire area is highly sensitive for buried cultural resources, particularly on the southern side closer to the Ford Lake. With the exception of 233 acres, the entire surface of the Gabrych Alternative has been plowed or impacted by other agricultural activities, thereby destroying the surface component of any late period cultural resources present in the APE throughout the remaining 1,905 acres of the alternative. Thus the potential for finding new significant sites during a Class III surface inventory is greatly reduced. Surface sediments within the alternative are of a recent Holocene age and likely low energy based on a cursory map-based geoarchaeological investigation of the area, suggesting that the potential for buried intact cultural resources is high. Impacts to potential, undiscovered subsurface archaeological sites at both the Gabrych Alternative and Proposed Project is comparable. While, analysis shows that the development of the Gabrych Alternative would likely impact fewer surface cultural resources, more site-specific details about cultural resources resulting from an intensive survey of the alternative would be needed to support this comparison.

Hazardous Materials Management

Environmental Setting. The topography of the Gabrych Alternative site is essentially flat, as are the immediately surrounding areas. Sensitive receptors are present within the Gabrych Alternative although the residential community located in the southern portion of the alternative site would be avoided by the solar filed layout. This notwithstanding, the residential community would be located within 1,000 feet of the portion of the Gabrych Alternative site that would be required for the solar facility.

Access to the Gabrych Alternative would likely be via Interstate 10 to Neighbors Boulevard. At Neighbors Boulevard, transport would turn south for approximately 12 miles through primarily agriculture lands.

Environmental Impacts. Hazardous materials use at the Gabrych 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 heat transfer fluid (HTF), diesel fuel, mineral insulating oil, lube oil, and small quantities of solvents and paints. 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.

Hazardous materials will be used and stored on site during the operation of the project, including 2 million gallons of HTF in the solar trough system. As stated in the **Hazardous Materials** section, Therminol VP1 is the HTF that will be used in the solar panels to collect solar heat and transfer it in order to generate steam to run the steam turbines. Therminol is a mixture of 73.5% diphenyl ether and 26.5% biphenyl, and is a solid at temperatures below ~54 °F. Therminol can therefore be expected to remain liquid if a spill occurs. While the risk of off-site migration is minimal, Therminol is highly flammable and fires have occurred at other solar generating stations that use it. Isolation valves would be placed throughout the HTF piping system. They will be designed to automatically block off sections of the piping in which a loss of pressure is detected (GSEP 2009). It appears that the placement of additional isolation valves in the HTF pipe loops throughout the solar array would add significantly to the safety and operational integrity of the entire system by allowing a loop to be closed if a leak develops in a ball joint, flex-hose, or pipe, instead of closing off the entire HTF system and shutting down the plant. In order to ensure that HTF leaks do not pose a significant risk, a condition of certification which would require the project owner to install a sufficient number of isolation valves that can be either manually or remotely activated would be required, as with the proposed BSPP.

A natural gas fueled auxiliary boiler would be used to support both freeze protection and rapid start-up of each of the two 125 MW plants each morning. As with the proposed GSEP site, the risk of a fire and/or explosion on site can be reduced to insignificant levels through adherence to applicable codes and the development and implementation of effective safety management practices. The National Fire Protection Association (NFPA) code 85A requires both the use of double-block and bleed valves for gas shut off and automated combustion controls. These measures will significantly reduce the likelihood of an explosion in gas-fired equipment. The safety management plan

proposed by the applicant would address the handling and use of natural gas, and would significantly reduce the potential for equipment failure because of either improper maintenance or human error.

Transportation of hazardous materials to the Gabrych Alternative site would require passing near residences located in the Palo Verde Valley. The transportation would be on Interstate 10 and Neighbors Boulevard. Neighbors Boulevard has few residences located in the vicinity as it primarily traverses agricultural lands.

Comparison to Proposed Project. The hazardous materials that would be used at the Gabrych Alternative site would be the same as those used at the proposed GSEP site; however, the Gabrych Alternative site has a greater number of sensitive subgroups or residences nearby. As such, the potential impacts at the Gabrych Alternative would likely be somewhat greater than at the proposed site. With adoption of the proposed conditions of certification, the Gabrych Alternative would comply with all applicable laws, ordinances, regulations, and standards (LORS) and result in no significant impacts to the public.

Public Health and Safety

Environmental Setting. The Gabrych Alternative site is located in an isolated area dedicated to farming and adjacent to the Colorado River and recreational areas. The nearest residences are located approximately 500 to 1,000 feet from the alternative site. 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 GSEP site, they are similar enough that the results of air dispersion modeling and a human health risk assessment for the Gabrych 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.

Two wet cooling towers for each power block are proposed by the applicant to cool ancillary equipment. In addition to being a source of potential toxic air contaminants, the possibility exists for bacterial growth to occur in the cooling towers, including Legionella. Legionella is a bacterium that is ubiquitous in natural aquatic environments and is also widely distributed in manufactured water systems. It is the principal cause of legionellosis, otherwise known as Legionnaires' Disease, which is similar to pneumonia. Additional information regarding legionellosis can be found in the **Public Health** section of the SA/DEIS. With the incorporation of conditions of certification such as those recommended in the **Public Health** section this impact would be less than significant.

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

Soil and Water Resources

Soils in the Gabrych Alternative site include Cibola, Gilman, Glenbar, Holtville, Imperial, Indio, Meloland, Ripley, and Rositas, much of which prime farmland (Soil Survey Staff 2009). These soils are formed in mixed alluvium and in sandy deposits blown from

alluvium and in gravelly to silty clay loam (CPUC 2006). Soil types include gravelly to sandy loam, silty clay loam to clay loam, and fine sand, very fine sand, silt loam and loam. Soils containing high percentages of fine sands and silt and that are low in density are generally the most erodible. Approximately 1,800 acres of land on this alternative site would be disturbed by the construction.

Imperial-Glenbar-Gilman soils are the soils of the adjacent agricultural area of Imperial County. Wind erosion potential is moderate with high runoff erosion potential. Permeability is relatively low. These soils are highly productive for farmland. Glenbar and Gilman soils have been listed by the California Department of Conservation as meeting the criteria for prime farmland. Imperial soils are designated by the same agency as meeting the criteria for farmland of statewide importance.

The Gabrych Alternative site lies within the Palo Verde Valley Groundwater Basin part of the Colorado River Hydrologic Region. The site is located on agriculture land. Five named irrigation canals cross the site: C Canal, D-23-1 Canal, D-23-1-3 Canal, D-23-1-4 Canal, and D-23-1-5 Canal. Approximately 7 acres of the Colorado River occur within the southern portion of the site, and is jurisdictional to the ACOE and CDFG. These acres would be avoided by the alternative.

A small stand of riparian scrub occurring along the D-23-1-3 Canal in the northeast portion of the site, as well as more extensive riparian habitat occurring along the C Canal in the southwestern portion of the site and along the Colorado River in the southern portion of the site would be considered waters of the state under the jurisdiction of the CDFG and may be considered waters of the U.S. under the jurisdiction of the ACOE.

The Palo Verde Irrigation District (PVID) is the sole entity in Palo Verde with rights to divert and use Colorado River water. PVID annually provides irrigation water to approximately 93,000 acres of farmland, primarily in the valley, with water diverted from the Colorado River. A major portion of the water that PVID diverts is consumed by the crops it irrigates. The portion of the applied water that is not consumed by crops percolates past the root zone to recharge the underlying aquifer.

Topography on the Gabrych Alternative site is relatively flat, with elevation ranging from approximately 200 to 300 feet above mean sea level. The Gabrych Alternative would use irrigation district water as the water supply; however, dry cooling would be required to reduce any impacts to Colorado River water. Unless reclaimed water could be used for construction purposes, it is likely that the water used during construction of the project would be offset by fallowing surrounding agricultural lands (a Water Conservation Offset Program) or by converting the Gabrych Alternative to non-agricultural uses.

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 fields would require substantial grading as in the proposed project. While the volume of earth movement required at the alternative site is unknown, the topography and slope of the Gabrych Alternative site are less severe than at the proposed GSEP site and have already been tilled for agriculture.

Being situated in an area near the banks of the Colorado River, portions of the Gabrych Alternative would be subject to sediment deposition and flooding from large floods on crossing the site. 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 GSEP 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. The Gabrych Alternative site would require the use of water from the Palo Verde Irrigation District. Because of this, it is likely that use of water at the Gabrych Alternative site would require a Water Conservation Offset Program intended to offset the water required during project construction. As with the proposed GSEP site, the applicant would need to complete Conditions of Certification that would require acquisition of entitlements to Lower Colorado River water to mitigate the project's contribution to impacts to the Colorado River, as well as comply with the Palo Verde Irrigation District regulations. However, the Palo Verde Irrigation District has an existing program with the Metropolitan Water District transferring saved water to urban Southern California. Should the project incorporate dry cooling, the amount of water used at the Gabrych Alternative site would be reduced from the current agriculture use and would potentially be applicable for inclusion in the Metropolitan Water District 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. However, the Gabrych Alternative would be located near the Colorado River and would potentially have greater contamination concerns than at the proposed GSEP site. The site construction will require a SWPPP which will specify Best Management Practices (BMPs) to minimize or eliminate water contamination.

As stated in the **Soil and Water** section of the SA/DEIS, the Land Treatment Unit (LTU) on the site would be used to treat soil that is impacted with Therminol® VP1 HTF, as a result of minor leaks or spills that occur during the course of daily operational or maintenance activities. At ambient temperatures, HTF is a highly viscous material that is virtually insoluble in water. Operation of an LTU is not expected to impact surface water or groundwater quality beneath the site. The LTU would be surrounded on all four sides by berms that would protect the LTU from surface water flow. Because of the viscous and insoluble nature of HTF, it is not likely to mobilize from the soil downwards to the water table. The LTU would be operated under the requirements of CCR Title 23, Division 3, Chapter 15, and Title 27, Section 2000 et seq. and Title 23, Section 2510 et

seq. Further discussion regarding the HTF and any HTF leaks can be found in the **Soil and Water** section.

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 with minimal existing drainage on the Gabrych Alternative would result in impacts similar to the proposed project. With incorporation of approximate BMPs, impacts to water quality would likely be similar as with the proposed project. With the incorporation of dry cooling and water conservation offsets, impacts due to water use would be reduced when compared with the proposed project. Unlike building at the proposed GSEP site, the Gabrych Alternative would not create impacts to Chuckwalla Wind Transport Corridor, nor would it create impacts to the Palen-McCoy Wind Transport Corridor.

Land Use

Environmental Setting. The Gabrych Alternative is located west of the Colorado River, in eastern Imperial County, just south of the Riverside County border. The Gabrych Alternative is crossed by Neighbors Boulevard and would be less than 1,000 feet north of a residential community. The Cibola National Wildlife Refuge is located three miles south of the site in Arizona. Federal land under BLM jurisdiction is located approximately five miles west of the site and would be crossed by the transmission interconnection. The Palo Verde Landfill, closed in 2007, is located approximately 4.5 miles southwest of the Gabrych Alternative site, on Stallard Road. Portions of the Gabrych Alternative belonged to the BLM but were part of a land exchange with the SF Pacific Properties INC, a subsidiary of the Catellus Development Corporation as succeeded by Eugene Gabrych and Marian Gabrych (BLM 2006).

The site consists of primarily fallow and active agricultural land. The surrounding area consists of primarily agriculture and the rural community of Harvey's Fishing Hole and Palo Verde. The Gabrych Alternative was designated as Agriculture in the Land Use Plan, updated in March, 2007 (Imperial County 2007).

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 2009). 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 2009). 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. The Gabrych Alternative site is comprised of active and previously farmed agricultural lands. The Gabrych Alternative consists of approximately 960 acres of Prime Farmland, 680 acres of Farmland of Statewide Importance, and 160 acres of Unique Farmland. 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. Unique Farmland consists of lesser quality soil for the production of agriculture crops and while usually irrigated may include non-irrigated orchards or vineyards. The Gabrych Alternative parcels are not under Williamson Act contracts.

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. The transmission interconnection would require a new transmission line crossing approximately 4 miles of agriculture lands.

Sensitive Land Uses. As stated above, the Gabrych Alternative would be located north of a small rural community, Harvey’s Fishing Hole, located at the intersection of Neighbors Boulevard and the Colorado River.

Transmission Interconnection. The transmission interconnection would trend westward for five miles through primarily agriculture lands until reaching the CDD designated utility corridor at which point the transmission interconnection would turn north. The transmission interconnection would then trend northward for approximately 12 miles adjacent to the WAPA 161 kV transmission line until reaching the proposed SCE Colorado Substation. Where the transmission interconnection would cross federal land under the management of the BLM, it would remain within a CDD designated utility corridor and would not require a land use plan amendment.

Environmental Impacts. Because of the desire to consider use of disturbed lands for large solar projects, the Gabrych Alternative site is located primarily 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 GSEP project at the Gabrych Alternative site would result in the conversion of up to 1,800 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. The California Agricultural Land Evaluation and Site Assessment (LESA) Model was used to assess impacts to the Gabrych Alternative site.

The California Agricultural LESA Model prepared by the California Department of Conservation is an optional model to use in assessing impacts on agriculture and farmland (CCR 2006).The formulation of a California Agricultural LESA Model is the result of Senate Bill 850 (Stats. 1993, ch. 812, section 3), which charged the Resources Agency, in consultation with the Governor's Office of Planning and Research, with developing an amendment to Appendix G of the California Environmental Quality Act (CEQA) Guidelines concerning agricultural lands. Such an amendment is intended "to provide lead agencies with an optional methodology to ensure that significant effects on the environment of agricultural land conversions are quantitatively and consistently considered in the environmental review process" (Public Resources Code Section 21095).

The California Agricultural LESA Model is composed of six different factors. Two "Land Evaluation" (LE) factors are based upon measures of soil resource quality. Four "Site Assessment" (SA) 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 (DOC 1997).

The LESA Model for the Gabrych 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 Gabrych Alternative is 73. Based on the California Agricultural LESA Thresholds, a score of 73 would result in adverse effects due to the permanent conversion of 1,800 acres of Farmland. As stated above, agriculture is the most important industry in Pale Verde Valley. 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 Gabrych Alternative 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 GSEP 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 Gabrych Alternative site would not require the use of BLM land, and would not require a land use plan amendment. However, use of the Gabrych Alternative site would result in greater impacts to agricultural land than the project site, including the loss of Prime Farmland and Farmland of Statewide Importance and the loss of approximately 1,800 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.

Recreation and Wilderness

Environmental Setting. The Gabrych Alternative would not be located adjacent to or near any wilderness areas. As such impacts to wilderness will not be addressed.

The Gabrych Alternative would be located north of the Colorado River and approximately 3 miles north of the Cibola National Wildlife Refuge. The Colorado River is used for a variety of recreational opportunities including boating. Some of the Colorado River recreational opportunities near the Gabrych Alternative include Taylor Ferry, an old, disused cable ferry; Gould Wash, a day use area; Harvey's Fishing Hole Boat Ramp, that includes campsites, boat rentals and repairs, fishing, and other amenities; and Cibola Farmers Bridge (CDBW 2010).

The Cibola National Wildlife Refuge is located in the floodplain of the lower Colorado River and surrounded by a fringe of desert ridges and washes. The refuge encompasses both the historic Colorado River channel as well as a channelized portion constructed in the late 1960's. Along with these main water bodies, several important backwaters are home to many wildlife species that reside in this portion of the Sonoran Desert. Recreational activities include fishing, hunting, and wildlife observation and photography (USFWS 2010).

Environmental Impacts. Project construction activities would create a number of temporary conditions that may impact recreationists travelling down the Colorado River. Noise, dust and heavy equipment traffic generated during construction activities would negatively affect a visitor's enjoyment of the recreation area. Disturbances to recreational activities would potentially cause a temporary reduction of visitation to Harvey's Fishing Hole as it is located immediately south of the Gabrych Alternative; however, the impacts to any boaters on the river would be temporary until the boat had passed beyond the Gabrych Alternative.

As stated above, a solar project at the Gabrych Alternative site would have a direct impact on recreational users at Harvey's Fishing Hole due to the changes to the landscape in the immediate area, construction and operational noise, and overall change to the pastoral setting. Some proportion of recreational users may ultimately prefer to visit other areas due to the industrial views of the Gabrych 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.

Comparison to Proposed Project. While the Gabrych Alternative site would be located near the Colorado River, frequently used for boating, the GSEP site would be near to BLM ACECs and wilderness areas, and the GSEP linears would cross one "open" route (as designated in the NECO Plan) . Additionally, impacts to recreation along the Colorado River would be temporary as recreationists would be traveling along the river and not remaining in one area. Because of this, impacts to recreation would be slightly less at the alternative site.

Noise

Environmental Setting. Generally low levels of ambient noise are expected along the Gabrych Alternative as this region is primarily for agriculture. However, ambient noise levels are expected to be elevated near Harvey's Fishing Hole.

Nearby sensitive receptors include the rural residences at Harvey's Fishing Hole, south of the Gabrych Alternative. The nearest residential area would be between approximately 500 to 1,000 feet south of the alternative site. There are no nearby sensitive receptors to the proposed site.

Environmental Impacts. As stated in the **Noise** section of this SA/DEIS, the construction of the GSEP 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 Gabrych Alternative site is located on land that is used for agriculture. Additionally, rural residences are located within 1,000 feet of the Gabrych Alternative within the town of Harvey's Fishing Hole. It is expected that operational noise would raise the ambient noise levels.

Comparison to Proposed Project. Building the GSEP at the Gabrych Alternative site would create a slightly greater impact than at the proposed site because of the closer proximity to a greater number of sensitive receptors (residences).

Socioeconomics and Environmental Justice

Environmental Setting. The Gabrych Alternative site is located in Imperial County, just south of the Riverside County border. The demographic characteristics of Riverside County are described in the **Socioeconomics and Environmental Justice** section of this SA/DEIS.

In 2000, as reported by the U.S. Census, the population of the Palo Verde/Harvey's Fishing Hole area was 287 people. Imperial County had a total population of 142,361 in 2000 and 161,867 in 2007 (California Department of Finance 2000 and Census Bureau). The unemployment rate for Imperial County was 24.5% in February 2009 (not seasonally adjusted). This is not full employment for Imperial County. Over the past few decades, full employment has been typically defined as approximately 4.0% to 5.5% unemployment. For California, the unemployment rate was 10.9% in February 2009 (not seasonally adjusted) (State of California Employment Development Department 2008a).

Environmental Impacts. Construction workers would most likely be from larger nearby cities such as Blythe. While there is limited housing available in the vicinity of the Gabrych Alternative site, workers could commute from Blythe, approximately 12 miles north of the Gabrych Alternative site. There are residential opportunities or amenities in Blythe in addition to campgrounds, RV parks, or motels (GSEP 2009a). Because it is unlikely that the construction workers would relocate to the immediate vicinity of the Gabrych Alternative site, this alternative 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. Gross public benefits from the GSEP, including capital costs, construction and operation payroll, and sales taxes, should it be built at the Gabrych Alternative site, are likely to be similar to the benefits from GSEP at the proposed site, although some of the economic benefits would likely occur in Palo Verde, Imperial County as well as in Blythe, Riverside County. Section 73 of the California Revenue and Taxation Code allows a property tax exclusion for certain types of solar energy systems installed between January 1, 1999 and December 31, 2016. The components that would be excluded include the solar components such as mirrors, solar boiler, heat exchangers in addition to the storage devices, power conditioning equipment, transfer equipment, and parts. As such, property tax income would not be expected to increase significantly from its current state.

Comparison to Proposed Project. The socioeconomic impacts of the GSEP at the Gabrych Alternative site would be similar to building and operating the project at the proposed site.

Traffic and Transportation

The Gabrych Alternative site is located south of I-10; access to the Gabrych Alternative site would be via Neighbors Boulevard off of I-10. Workers employed to construct the project at this alternative site would most likely commute from Blythe (12 miles) or the Coachella and Indio (up to 90 miles). Given the limited use of I-10 east of Palm Springs, added construction traffic on the I-10 would be unlikely to impact the level of service.

The Gabrych Alternative would be located approximately 1,000 feet north of Harvey's Fishing Hole, a public boating launch.

Environmental Impacts. Before construction could occur at the Gabrych 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-10 and other smaller roads for access and are located adjacent to each other.

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-4, which requires mitigation in the form of including opaque privacy

slats on the perimeter chain link fencing proposed by Applicant along the length of the project adjacent to Interstate 10. That measure would be adapted to this alternative along Neighbors Boulevard. Fewer motorists would be impacted by glare at the Gabrych Alternative site than at the proposed GSEP site; however, the rural community of Harvey's Fishing Hole would be potentially impacted by glare as it is located between 500-1,000 feet south of the project site.

Comparison to Proposed Project. Impacts to traffic and transportation at the Gabrych Alternative site would be similar to those at the proposed GSEP site.

Transmission Line Safety and Nuisance

Environmental Setting. The Gabrych Alternative site would connect with the SCE system at the proposed Colorado Substation through a new transmission line that would exit the alternative site and trend west for approximately 5 miles then turn north for approximately 12 miles The new transmission line would cross BLM land and active and fallow agricultural land and would be located adjacent to the existing WAPA 161 kV transmission line and would be located within an existing CDD designated utility corridor.

The transmission line would be within 500 feet of rural residences within the town of Palo Verde.

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 GSEP 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 Gabrych Alternative site would require a shorter transmission line interconnection with the SCE transmission system; however, much of the GSEP transmission interconnection would be located on already existing poles as the conductor would be strung on poles erected for the Blythe Energy Transmission Line. While the electric and magnetic fields would be managed to an extent the CPUC considers appropriate, the transmission line would be located within 500 feet of approximately 15 residences. The transmission interconnection for the

proposed site would not be located within 500 feet of any residential properties; as such, this impact would be greater for the Gabrych Alternative site than for the proposed site.

Visual Resources

Environmental Setting. The Gabrych Alternative site is located on primarily private land surrounded by agricultural lands east of the town of Palo Verde in Imperial County. The rural community of Harvey's Fishing Hole is located south of the Gabrych Alternative site along the Colorado River. A small sand/gravel mining operation occurs just west of the residential area. The site is crossed by Neighbors Boulevard. This infrastructure introduces developed and industrial features to the otherwise visually open and rural setting.

Views from the Gabrych Alternative site to the north and west are pastoral, of agriculture lands. Views to the east and south are of the Colorado River and further views are also of agriculture lands and some open space in Arizona.

The linear facilities associated with the Gabrych Alternative site include a 230 kV transmission line approximately 17 miles long. The transmission lines would be primarily located in a CDD Designated Utility Corridor.

Environmental Impacts. As stated in the **Visual Resource** section, the Energy Commission staff, in coordination with BLM, used a standard visual assessment methodology developed by California Energy Commission staff and applied to numerous siting cases in the past in this study. A description of this methodology is provided in **Appendix VR-1** for the proposed GSEP project**.**

The existing visible physical environmental setting and the anticipated visual change introduced by the proposed project are considered from representative, fixed vantage points. The likelihood of a visual impact is determined in this study by two fundamental factors: the susceptibility of the setting to impact as a result of its existing characteristics (reflected in its current level of visual quality, the potential visibility of the project, and the sensitivity to scenic values of its viewers); and the degree of visual change anticipated as a result of the project. These two factors are summarized respectively as *visual sensitivity* (of the setting and viewers), and *visual change* (due to the project).

With the addition of the project, views of the alternative site would change from an open and pastoral landscape to a substantially more industrial, highly altered one. The industrial landscape would be dominated by the eighteen hundred acres of solar troughs, approximately 30-feet tall. There would be no natural features to block the view of the solar facilities on any side. However, the alternative site would be located adjacent to a gravel mine which would have already introduced some built environment into the area.

The Gabrych Alternative site views would be prominent from Neighbors Boulevard for both northbound and southbound traffic, which is relatively minimal. Travelers would be immediately adjacent to the project, and there is little elevation or natural contouring to block views of the solar field. The GSEP would be located over 3 miles from the I-10 and would not be highly visible from the I-10.

The landscape surrounding the alternative site is within the Palo Verde Irrigation District and is flat, exhibits a prominent horizontal line, and is relatively non-descript. The more distant, angular mountains provide a backdrop of visual interest. Landform colors are tan to dark green. The overall landscape character and visual quality is predominantly pastoral in appearance with a few structures at Palo Verde and Harvey's Fishing Hole slightly visible above the vegetative line.

The alternative's 230 kV transmission line interconnection would introduce additional industrial character to this agriculture area; however, it would be partially located within a CDD Designated Utility Corridor and would be adjacent to an existing 161 kV transmission line for 12 miles. The Gabrych Alternative transmission line would be required to cross SR 78.

Comparison to Proposed Project. The Gabrych Alternative site would be located in a more developed and disturbed area compared with the proposed GSEP site. However, the Gabrych Alternative would be expected to be visible to a greater number of viewers than the GSEP site and would create somewhat greater visual impacts.

The Gabrych Alternative transmission line would create a lesser visual impact than the GSEP proposed site transmission interconnection because it would not need to cross the I-10 to reach the substation, and would not be located adjacent to a heavily used freeway. The Gabrych Alternative transmission line would be required to cross SR 78; however, this has a fewer number of viewers than the I-10. Both transmission lines would be adjacent to existing transmission lines.

Waste Management

Environmental Setting. In 2002, a leaking diesel fuel tank caused a sheen on the Colorado River just south of the Gabrych Alternative (OES 2002). The report filed by the California Fish & Game stated that the leak was caused by one of three 4,000 gallons tanks of diesel on a farm in Arizona across from Harvey's Fishing Hole (OES 2002). Additionally, because the site and surrounding area is used for agriculture, it is possible that the site has been contaminated by agriculture residues.

Environmental Impacts. Both nonhazardous and hazardous wastes would be created by the construction of the project at the Gabrych Alternative site in similar quantities as at the proposed site and would be disposed of at the same facilities as for the proposed project. 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 GSEP site or the Gabrych Alternative site would produce minimal maintenance and plant wastes.

As discussed in the **Waste Management** section of this SA/DEIS, preparation and construction of the two phases of the proposed solar project and its associated facilities would last approximately 37 months and generate both non-hazardous and hazardous wastes in solid and liquid forms. Before construction can begin, the project owner will be required to develop and implement a Construction Waste Management Plan per mitigation similar to the Condition of Certification proposed for the GSEP, to ensure that the waste will be recycled when possible and properly disposed of in landfills when

necessary. As with the proposed GSEP project, construction activities would generate an estimated 40 cubic yards per week of non-hazardous solid wastes, consisting of scrap wood, steel, glass, plastic, and paper, and another 1 cubic yard per week of office-related waste. Of these items, recyclable materials would be separated and removed as needed to recycling facilities. Non-recyclable materials (insulation, other plastics, food waste, roofing materials, vinyl flooring and base, carpeting, paint containers, packing materials, etc.) would be disposed at a Class III landfill.

Non-hazardous liquid wastes would be generated during construction, and would include 200 gallons of sanitary waste per day. Sanitary wastes would be pumped to tanker trucks by licensed contractors for transport to a sanitary water treatment plant.

During construction, anticipated hazardous wastes include waste paint, spent construction solvents, waste cleaners, waste oil, oily rags, and waste batteries. Estimated amounts are 1 cubic yard of empty containers (per week), 175 gallons of oils, solvents, paint, and oily rags (every 90 days), and 10 batteries (per year). Empty hazardous material containers would be returned to the vendor or disposed at a hazardous waste facility; solvents, used oils, paint, oily rags, and adhesives would be recycled or disposed at a hazardous waste facility; and spent batteries would be disposed at a recycling facility. In addition, a one-time generation of 1,000 gallons of Heat Exchanger cleaning solvent (chelant type solution) would require disposal at a permitted hazardous waste facility (GSEP 2009a, pages 5.13-5).

The generation of hazardous waste requires a unique hazardous waste generator identification number. The hazardous waste generator number is determined based on site location and therefore, both the construction contractor and the project owner/operator could be considered the generator of hazardous wastes at the site. Therefore, the project owner would be required to obtain a unique hazardous waste generator identification number for the site prior to starting construction. This would ensure compliance with California Code of Regulation Title 22, Division 4.5.

Comparison to Proposed Project. The environmental impacts of waste disposal at the Gabrych Alternative site would be similar to those at the proposed GSEP site.

Worker Safety and Fire Protection

Environmental Setting. The Gabrych Alternative site would be located within an area that is primarily agricultural and adjacent to the Colorado River. Although the Gabrych Alternative is located in Imperial County, the nearest fire departments are located in Riverside County. The two nearest county fire stations are RCO Station #45, located at Blythe Air Base, 17280 W. Hobson Way, Blythe, and RCO Station #44, located at Ripley, 13987 Main Street, Ripley (RCFD 2010a). The Worker Safety and Fire Protection section in this SA/EIR provides more information regarding the Riverside County Fire Department. The fire risks of this alternative site would be similar to those of the proposed GSEP site as both have desert conditions.

Environmental Impacts. A solar plant at the Gabrych 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 Riverside County Fire Department and 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 Gabrych Alternative site would be similar to the proposed site although the response time would be expected to be better at the alternative site due to its proximity to the RCO Station #44.

Engineering Assessment for Gabrych Alternative

Facility Design

The design of a 250 MW project at the Gabrych Alternative would be similar to that of GSEP at 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. The Gabrych Alternative is located near the southeastern edge of the Palo Verde Valley, a river valley of the Colorado River, in the Colorado Desert Region. The Colorado Desert region lies mostly at a low elevation and consists of desert basins with interspersed northwest-trending mountain ranges. The Gabrych Alternative generally crosses alluvial plains and valleys. Geologic units underlain by the alternative site are primarily recent alluvium (Qal) or unconsolidated alluvial fan, river channel, and stream deposits consisting of silt, sand, clay, and gravel (CPUC 2007). Recent alluvium also includes recent floodplain deposits of the Colorado River (silt, sand, and clay).

The Gabrych Alternative is located in an area of low seismic activity. No active faults cross the alignment or are located in the vicinity. The estimated peak horizontal acceleration for this alternative route is less than 0.2 g; therefore, this area should not experience strong groundshaking. The lack of strong groundshaking and deep groundwater elevations preclude liquefaction-related phenomena. This alternative is located on flat to gently sloping alluvial fans and alluvial plains that are not susceptible to landslides (CPUC 2007).

Liquefaction is the phenomenon in which saturated granular sediments temporarily lose their shear strength during periods of earthquake-induced, strong groundshaking. The susceptibility of a site to liquefaction is a function of the depth, density, and water content of the granular sediments, and the magnitude and frequency of earthquakes in the surrounding region. Saturated, unconsolidated silts, sands, and silty sands within 50 feet of the ground surface are most susceptible to liquefaction. Liquefaction-related phenomena include lateral spreading, ground oscillation, flow failures, loss of bearing strength, subsidence, and buoyancy effects (CPUC 2007). In addition, densification of the soil resulting in vertical settlement of the ground can also occur. As the Gabrych Alternative site is located less than 1,000 feet north of the Colorado River, liquefaction is consid-

ered a potential hazard (CPUC 2007). However, due to the low potential for strong groundshaking, liquefaction would likely occur only during a “great” earthquake (CPUC 2007).

One mineral resource site is located within the alternative site; a gravel pit surface mining operation owned by Empire Communities, LLC (BLM 2010). This mining facility would be avoided by the solar field layout.

The Gabrych Alternative is expected to have a low potential for finding paleontological resources because it is primarily underlain by Holocene Alluvium and because it has been previously disturbed for agricultural practices.

Environmental Impacts. Minimal seismic ground shaking is expected at the Gabrych Alternative site because it is not located within a seismically active area and is not on a known fault line. The severity and frequency of ground shaking associated with earthquake activity at the Gabrych Alternative site is expected to be similar to that of the proposed site. However, the potential for liquefaction in this area is high due to anticipated depths of groundwater. As such, design criteria would be required for the Gabrych 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 paleontological sensitivity and potential to encounter significant paleontological resources at this alternative site and the GSEP site is similar. As stated in the **Geology, Paleontology, and Minerals** section, construction of the proposed project will include mass grading, deep foundation excavation, and utility trenching. There exists the probability of encountering paleontological resources. As with the proposed project 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 Gabrych Alternative site is subject to a similar risk of geologic hazards as the proposed project site. Although not expected, 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 GSEP site. The conditions of certification provided in the **Geology, Paleontology and Minerals** section would be applicable to the Gabrych Alternative site.

Power Plant Efficiency

The plant configuration and solar trough technology that would be employed at the Gabrych 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 Gabrych 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 Gabrych Alternative site would require a shorter connector line than at the proposed site. Once collected, the power would interconnect with the proposed Colorado River Substation. As such, the transmission system evaluation for the Gabrych Alternative site would be similar to that of the proposed GSEP.

Summary of Impacts – Gabrych Alternative

The Gabrych Alternative site would have impacts similar to the proposed GSEP site for 10 of the 20 environmental and engineering resource elements discussed above: air quality, public health, socioeconomics, traffic and transportation, waste management, facility design, geology, paleontology and minerals, power plant efficiency, power plant reliability, and transmission system engineering.

The proposed GSEP site is preferred over the Gabrych Alternative site in five resource elements: hazardous materials, land use, noise, visual resources, and transmission line safety and nuisance.

The Gabrych Alternative site is preferred over the proposed GSEP site for six resource elements: recreation and wilderness, soils and water, worker safety and fire protection, biology, and cultural resources. Impacts to biological and cultural resources are anticipated to be reduced at the Gabrych Alternative site compared to at the GSEP site because the Gabrych 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 Gabrych Alternative site, a detailed comparison is not possible.

B.2.8 ALTERNATIVES CONSIDERED BUT NOT EVALUATED IN FURTHER DETAIL

B.2.8.1 Site Alternatives

This section considers potential alternatives to the proposed GSEP that were evaluated, and determined to not be feasible or result in lesser impacts than the proposed action. Because these alternatives would not avoid or substantially reduce the adverse impacts of the proposed GSEP 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. The following alternative sites were evaluated in this analysis:

- McCoy Alternative
- Desert Center 1 Alternative
- Mule Mountain Alternative
- Black Hill Alternative

- Private Land Alternative
- Western ROW Alternative
- Reclaimed Water Alternative

McCoy Alternative

The McCoy Alternative was identified by NextEra in the AFC as a potential alternative site for the proposed project. The McCoy Alternative is located on BLM-administered land at T5S R21E Section 28. It is located northwest of Blythe, Riverside County (see **Alternatives Figure 4)** and is west of a CDCA utility corridor. The elevation of McCoy Alternative is between approximately 500 and 600 feet above sea level. The alternative identifies approximately 7,750 acres; however, it is assumed that approximately 1,800 acres of land would be required for the alternative.

McCoy was not pursued by NextEra as a possible site for the proposed project because it is being considered for a future solar project by NextEra.

Environmental Assessment. As with the proposed GSEP solar site, the McCoy Alternative site would require use of approximately 1,800 acres of land and would result in the permanent loss of approximately 1,800 acres of desert habitat. The project would require grading of approximately 1,800 acres and it is expected that because of the extensive grading, the alternative site would result in impacts to biological and cultural resources. The project site is adjacent to Nelson Bighorn Sheep Wildlife Habitat Management Area.

Both the proposed GSEP site and McCoy site would have a large footprint and require extensive grading, potentially resulting in erosion and runoff. The McCoy site is crossed by three large desert washes, potentially increasing the sediment flow in and around the site. Given the size of the power plants and the approximately 30-ft tall solar trough structures, visual impacts would be considerable. However, few sensitive receptors would be located adjacent to the McCoy site. The McCoy site would cross a designated open route (NECO Plan) and would potentially create impact to recreational uses of the route.

Rationale for Elimination. The McCoy site is located on undisturbed public land. This alternative would not reduce impacts of the proposed GSEP without creating severe impacts of its own. Therefore, the McCoy Alternative was eliminated from further consideration in this SA/DEIS.

Additionally, 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-administered land with a pending application for another project is not considered a reasonable alternative to the proposed project for purposes of alternatives analysis. Therefore, an alternative site on BLM-administered land with a pending application, such as the McCoy Alternative, would not be a reasonable alternative for the proposed GSEP project unless that other application is rejected or withdrawn.

Desert Center 1 Alternative

The Desert Center 1 Alternative was identified by NextEra in the AFC as a potential alternative site for the proposed project. The Desert Center 1 Alternative is located on BLM-administered land north of Desert Center, adjacent to Highway 177, in Riverside County (see **Alternatives Figure 4)**. The elevation of Desert Center 1 Alternative is between approximately 500 and 700 feet above sea level. The site is located east of Joshua Tree National Park. Joshua Tree National Park is nearly 800,000 acres large and is used for hiking, mountain biking, rock climbing, and includes nine campgrounds. In 2007, NextEra applied for a right-of-way grant for the Desert Center 1 Alternative but after additional examination including environmental concerns, road access, conflicting uses, and transmission option, the application was withdrawn (GSEP 2009a). Most recently, the Solel project (CACA 49494) was proposed at this location (BLM 2009).

Rationale for Elimination The Desert Center 1 Alternative was not found to be a reasonable alternative for the proposed project. In August of 2008, the BLM indicated that the Desert Center 1 region was in an area that would potentially be subsumed in expansions of the Joshua Tree National Park and/or the McCoy Wilderness (AECOM 2010a). The BLM rejected the Solel application for this location in October of 2009 due to lack of due diligence.

Mule Mountain Alternative

The Mule Mountain Alternative was identified by NextEra in the AFC as a potential alternative site for the proposed project. The Mule Mountain Alternative is located on federal land administered by the BLM, and is located west of the town of Blythe, south of the I-10 in eastern Riverside County; see **Alternatives Figure 4**. The elevation of Mule Mountain Alternative is approximately 500 feet above sea level. The site would be located on 6,950 acres, at T7S R20E, Section 12. In 2007, NextEra applied for a right-of-way grant for the Mule Mountain Alternative but after additional examination including environmental concerns, road access, conflicting uses, and transmission option, the application was withdrawn (GSEP 2009a). The Bullfrog Green Energy Mule Mountain solar project is proposed at this location (BLM 2009b).

Environmental Assessment. As with the proposed GSEP site, the Mule Mountain Alternative site would require use of approximately 1,800 acres of land and would result in the permanent loss of approximately 1,800 acres of desert habitat. The project would require grading of approximately 1,800 acres and it is expected that because of the extensive grading, the alternative site would result in impacts to biological and cultural resources. According to CNDDB records, the site would support Desert Tortoise, Harwood's Milk Vetch, Cave Myotis, and California leaf-nosed bat (GSEP, 2009f).

Both the proposed GSEP site and Mule Mountain site would have a large footprint and require extensive grading, potentially resulting in erosion and runoff. The Mule Moutnain site is crossed by two large desert washes, potentially increasing the sediment flow in and around the site. Given the size required for solar power plants and the approximately 30-ft tall solar trough structures, visual impacts would be considerable and similar to those at the proposed GSEP solar site. The Mule Mountain site would be visible from the Mule Mountains ACEC to the east.

Rationale for Elimination. The Mule Mountain site is located on undisturbed public land. This alternative would not reduce impacts of the proposed GSEP without creating severe impacts of its own. Therefore, the Mule Mountain Alternative was eliminated from further consideration in this SA/DEIS.

Additionally, 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-administered land with a pending application for another project is not considered a reasonable alternative to the proposed project for purposes of alternatives analysis. Therefore, an alternative site on BLM-administered land with a pending application, such as the Mule Mountain Alternative, would not be a reasonable alternative for the proposed GSEP project unless that other application is rejected or withdrawn.

Black Hill Alternative

The Black Hill Alternative was identified by NextEra in the AFC as a potential alternative site for the proposed project. The Black Hill Alternative is located on BLM-administered land north of Blythe, in Riverside County; see **Alternatives Figure 4**. The elevation of the Black Hill Alternative is between approximately 600 to 700 feet above sea level. NextEra stated that the total acreage for the Black Hill Alternative is 8,720 acres (GSEP 2009f). In 2007, NextEra applied for a right-of-way grant for the Black Hill Alternative but after additional examination including environmental concerns, road access, conflicting uses, and transmission option, the application was withdrawn (GSEP 2009a). Most recently the OTB Power Holdings, Inc. project (CACA 049098) was proposed at this site and denied by the BLM (BLM 2009b).

Environmental Assessment. As with the proposed GSEP site, the Black Hill Alternative would require use of approximately 1,800 acres and would result in the permanent loss of desert habitat. The project would require grading of approximately 1,800 acres and it is expected that due to the extensive grading requirement, building the GSEP at the alternative site would likely result in impacts to biological and cultural resources.

Impacts to land use and recreation at the Black Hill Alternative would potentially be significant as it is located adjacent to the Big Maria Mountains Wilderness and is crossed by three designated open routes (NECO Plan). Because it is immediately north of several rural residences, impacts to public health, noise and visual resources would potentially be worse than at the proposed site.

Both the proposed GSEP site and Black Hill Alternative site would have a large footprint and require extensive grading, potentially resulting in erosion and runoff. The Black Hill Alternative site is crossed by ephemeral waters and washes that would likely be rerouted. As stated above, Black Hills Alternative site is north of several residences and would likely be visible from these residences. Given the size required for solar power plants and the approximately 30-ft tall solar trough structures, visual impacts would be considerable and similar to those at the proposed GSEP site.

Rationale for Elimination. The Black Hills Alternative would not reduce impacts of the proposed GSEP without creating significant impacts of its own. Therefore, the Black Hills Alternative was eliminated from further consideration in this SA/DEIS.

Additionally, in the fall of 2008, the BLM rejected the OTB Power Holdings, Inc. application for a right-of-way grant at the Black Hills Alternative site (BLM 2009b). This application was rejected for lack of due diligence.

Private Land Alternative

Two private landholdings were considered by NextEra in addition to the Gabrych private land addressed above. However, after additional research the applicant determined that any water use in the Blythe area might impact the Colorado River water basin (GSEP 2009f). As such, the private lands were eliminated from consideration by the applicant (GSEP 2009f). Because dry cooling is a feasible technology that could be used with any alternative site, private land alternatives near the Blythe area were not immediately eliminated for purposes of the SA/DEIS. As such, the Gabrych Alternative was retained for CEQA purposes and is discussed in **Section B.2.7.2.**

The additional private sites considered by the applicant, the Farmland Reserve site and the Sunworld site, would also be located on private, disturbed land, and would include portions of land that were previously used for agriculture but that are no longer actively farmed. However, the portions of the Farmland Reserve and Sunworld sites that are no longer actively farmed have been considered as a potential alternative to the Blythe Solar Power Project [09-AFC-6] (CEC 2010a). Additional inactive agriculture land is located near Desert Center and is analyzed as the North of Desert Center Alternative for the Palen Solar Power Project SA/DEIS [09-AFC-7] (CEC 2010b).

They not fully analyzed for the GSEP because the Gabrych Alternative is considered to be an adequate consideration of a private land alternative. However, it should be recognized that more than 1,800 acres of no longer active agriculture land are located northwest of Blythe and has been analyzed in the Blythe Solar Power Project SA/DEIS as the Blythe Mesa Alternative.

Western Right of Way Alternative

The Genesis ROW application is for a total of 4,640 acres. The GSEP, as proposed, would occupy 1,800 acres within the eastern portion of the ROW application. The remaining 2,840 acres are not occupied by the project. Because of concern regarding impacts to sand transport by wind from the two aeolian corridors (west along the Chuckwalla Valley parallel with I-10 and south down the Palen-McCoy valley), and water-based sand transport down the multiple alluvial fan channels that the site intersects, incorporating a portion of the western ROW was considered. The western portion of the ROW would not accommodate a 125 MW solar field as configured for the proposed GSEP. However, the western portion of the ROW occupies sufficient acreage for revised configuration a 125 MW solar field. Use of the western ROW would require longer linear infrastructure.

After further study of both the Palen-McCoy Valley aeolian sand corridor and the Chuckwalla Valley sand transport, it was concluded that the proposed GSEP footprint

was less of a concern from an aeolian perspective. The proposed footprint avoids most of the Chuckwalla sand corridor and most of the dominant aeolian sand migration in the Palen-McCoy corridor. A sand transport report is included as the **Soils and Water Section Appendix A.**

When considering use of the western ROW, additional concerns were raised. A reconfigured solar field in the western ROW would increase the linear footprint of the project and potentially cause greater impacts to the alluvial fan drainage plan. A more linear footprint would require collecting additional channels into an interceptor drain and concentrating the flow and releasing it downstream. Concerns regarding the western ROW's proximity to the Palen Dry Lake ACEC and the potential to impact significant sensitive cultural resources were also raised. Because use of the western ROW did not reduce impacts as originally believed and would have the potential to introduce additional impacts, it was not evaluated in further detail.

Reclaimed Water Alternative

The applicant considered a variety of reclaimed water sources as alternatives to the proposed on-site groundwater wells. These include (GSEP 2009f):

- City of Blythe Water Production and Treatment Facility, Reclaimed Water (approximately 400 acre feet);
- Chuckwalla State Prison, Wastewater (approximately 600 acre feet);
- Colorado River Sewage System Joint Venture, Westates, near Parker AZ (N/A); and
- Metropolitan Water District of Southern California, Desert Center Plant Wastewater (approximately 10-20 acre feet).

Additional water sources were identified in Section 3.0 Facility Description of the AFC, but these sources, such as Colorado River water, are not considered reclaimed water. None of the reclaimed water sources identified by the applicant would have sufficient reclaimed water supply as to make a viable alternative water supply.

Additionally, directly using reclaimed water would not change the overall water balance for the groundwater basin. Reclaimed water is already accounted for as recharge to the groundwater system. An upgraded treatment, including a pump station and pipeline may actually lessen the amount of water in the overall water balance due to increased losses in the treatment and transport. Evaporation losses would likely increase with additional treatment as well. As such, this alternative was not evaluated in further detail.

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 GSEP (which would use the solar trough 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 are considered in this analysis:

- Stirling energy systems technology

- solar power tower technology
- linear Fresnel technology
- photovoltaic technology

Among the solar thermal technology alternatives, the linear Fresnel alternative has the potential for least impacts due to its more compact configuration (reducing ground disturbance); however, the technology is proprietary and is not available to other developers. The distributed solar alternative would have fewer impacts than the proposed project because it would be located on already existing buildings or on already disturbed land. However, achieving 250 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. Additional technologies, like utility-scale solar thermal generation, are also necessary.

The following analyses assumed that the alternative technologies would be implemented on the site for the proposed GSEP, in eastern Riverside County.

Alternatives Table 3. Summary Characteristics of Solar Technologies

Technology	Parabolic trough	Solar Power Tower	Stirling Engine	Linear Fresnel	Photovoltaic
Water Use/ 100 MW (Assumes dry cooling)	~65 AFY	~20 AFY	~5 AFY	~12 AFY	~2-10 AFY
Acres per MW	6-7	10	9	4	8-12
Low Impact Construction Possible	No	Yes	Yes	No	Yes
Tallest component (does not include cooling towers or Transmission Line)	25 feet – trough	300 - 650 feel	38 feet - engine	56 feet	10 -15 feet (+ inverter station)
Slope requirements	2% or less	5% or less, can use LID	6% or less, can use LID	1% or less	3% or less, can use LID
Siting restrictions	Troughs are 1300 feet long, requires contiguous land	Heliostats must be in concentric circles around power tower	Can be sited in irregular shapes	Requires rectangles, requires contiguous land	Can be sited in irregular shapes
Heat Transfer Fluid (do not include water)	Yes	No	No	No (water used)	No

Stirling Dish Technology

The Stirling dish technology converts thermal energy to electricity by using a mirror array to concentrate and focus sunlight on the receiver end of a Stirling engine. The curved dishes that focus the sun's energy are approximately 45 feet tall and occupy a maximum horizontal space of approximately 1,135 square feet (0.026 acres), with an

anchored footprint of 12.5 square feet (assumed 4-foot diameter caisson). See **Alternatives Figure 5** for an illustration. The internal side of the receiver heats hydrogen gas, which expands. The pressure created by the expanding gas drives a piston, crankshaft, and drive shaft. The drive shaft turns a small electricity generator. The entire energy conversion process takes place within a canister the size of an oil barrel. The generation process requires no water, and the engine does not produce emissions as no combustion takes place. Each concentrator consists of one Stirling engine mounted above one mirror array. Once installed, each concentrator requires very little maintenance aside from periodic washing of the mirrored surfaces of the dish.

In general, the Stirling system requires 7 to 9 acres of land per MW of power generated. Based on literature search, a 250 MW Stirling engine field would require from 1,750 acres to 2,250 acres of land. The two proposed solar thermal power plants using Stirling engine technology currently being considered by BLM and the Energy Commission, SES Solar 1 and 2, have a land use per MW of installed capacity of approximately 8.3 acres per MW, and would require a greater footprint than the GSEP.

Site preparation involves sinking a cement base with an embedded pedestal to support the dish (SES 2008). Each Stirling dish generates 25 kilowatts (KW) of power, so 10,000 dishes would be required to generate 250 MW. Each dish includes two major elements:

- **Solar Concentrator.** Large parabolic concentrators include 89 mirror facets attached to a frame by three point adjusting mounts (SES 2008). They are designed in five subassembly units for ease of transport and installation on site. Two small motors are attached to the pedestal and programmed to swivel the dish on two axes, following the sun's progress across the sky during the day.
- **Power Conversion Unit.** The Stirling engine's cylinder block incorporates four sealed cylinder assemblies along with coolers, regenerators, and heater heads (SES 2008). Concentrated solar energy heats up self-contained gas (hydrogen) in the power conversion unit, causing the gas to expand into the cylinders, moving the cylinders, and generating electricity. This cycle is repeated over and over as the engine runs at a steady rate of 1,800 rpm (SES 2008). Power is generated by heat transfer from the concentrated solar rays to the working gas in the engine's heater head, which converts the heat energy into mechanical motion.

The generator of each unit in a utility-scale project is connected by underground transmission line to a small substation where the power can be transformed into a higher voltage for more efficient transmission across the grid.

Environmental Assessment. The land area required for a 250 MW Stirling engine power plant is greater than that required for the proposed GSEP. However, it is not necessary to grade the entire parcel as only the 18-inch diameter pedestal of the Stirling engine requires level ground. It would still be necessary to grade permanent access roads between every two rows of Stirling engines due to the need for regular washing of the mirrors. This grading would cause removal of vegetation. Additionally, because the proposed GSEP site is crossed by several desert washes, the installation of 10,000 Stirling engines could require a larger total acreage of land, resulting in a greater loss of habitat.

Stirling engines systems require minimal water use during operations. The SES Solar Two, a 750 MW project using the SunCatcher technology, would require approximately 32.7 acre feet per year. This technology would require less water than the proposed solar trough technology.

Due to the size and height of the Stirling mirrors, impacts to visual resources would be similar or greater to those of the GSEP. The 10,000 Stirling engines would introduce an industrial character and transformation of the site with the 45 foot tall engines. There would be less grading for the Stirling engine structures, but the numerous access roads required for cleaning the energy systems would create a high contrast between the disturbed area and its surroundings. The project would still require use of I-10 for commuting workers during both construction and operation.

Summary of Impacts. The large area needed for a Stirling engine power plant would be greater than the land requirement for the GSEP. Although grading requirements for the Stirling engines and solar concentrators are relatively small, grading for access roads would be extensive because access roads are required for every other row of Stirling engines (SES 2008). For these reasons, recreation and land use, and biological resources impacts would be similar to those of the GSEP facility. In addition, due to the extent of the facility and the height of each concentrator, visual impacts would not be significantly reduced by this alternative and may be greater considering that the 45-foot high solar concentrators would be more pronounced than the approximately 30-foot high solar troughs. However, the Stirling technology does not require a turbine and would use less water than the GSEP.

Rationale for Elimination

Stirling engine systems are a viable renewable technology but would potentially increase the footprint of the project between 10 and 45 percent. Additionally, due to its greater height, it would potentially increase visual impacts. With a minimum size of nearly 1,750 acres, Stirling engine technology would not eliminate any of the significant impacts of the GSEP 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 6** for an illustration. The solar power towers can be up to 600 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 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 250 MW solar power tower field would require from 1,250 acres to 2,500 acres of land. The proposed solar power tower plant currently being considered by BLM and the Energy Commission, Ivanpah Solar Electric Generating System, is

using approximately 10 acres per MW, and would require a greater footprint than the GSEP.

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.** Tower structure height is up to 600 feet. Primary thermal input is via solar receiver boilers, superheater and reheaters at the top of the distributed power towers.
- **Steam Turbine Generator**. 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 250 MW solar power tower plant is likely greater to that required for the proposed GSEP. 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 GSEP 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 GSEP and would introduce an industrial character to this site and the surrounding areas.

Because of the height of the solar power towers and the direction that the sun is reflected by the heliostats, there may be concerns regarding any nearby aviation operations or military operations. Power tower technology would need to be reviewed for consistency with the Compatibility Plan adopted by the Riverside County Airport Land Use Commission. Policy 4.3.7 of the Countywide Policies of the 2004 Riverside County Airport Land Use Compatibility Plan includes guidance on characteristics to be avoided including glare or distracting lights which could be mistaken for airport lights. The Compatibility Plan also prohibits any use which would cause sunlight to be reflected toward an aircraft engaged in an initial straight climb following takeoff or toward an aircraft engaged in a straight final approach toward a landing at the airport.

Rationale for Elimination

The large area needed for a solar power tower plant would be greater than the land requirement for the GSEP. Grading requirements for the solar power tower would be less than for the GSEP because the solar power tower technology does not require

grading of the entire solar field; however, grading would still be required for the access roads in between the rows of heliostats. For these reasons, recreation and land use, biological resources, and cultural resource impacts would be similar to those of the GSEP. In addition, due to the extent of the facility and the height of the power towers, impacts to the Desert Center Airport would potentially be greater for this alternative.

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 4 to 5 acres of land per MW of power generated. A 250 MW solar linear Fresnel field would require approximately 1,000 – 1,250 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, Ausra will focus on medium-sized (50 MW) solar steam generating systems for customers including steam users, such as food processors, enhanced oil recovery firms, and utilities for power augmentation systems that deliver steam into existing fossil-fuel power plants. A project

of 250 MW is theoretically possible, and would require smaller acreage per megawatt. However, at nearly 1,250 acres for 250 MW, this technology would not eliminate the significant impacts of the proposed solar trough 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 First Solar (see **Alternatives Figure 7**)
- 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 7**.

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 3 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 250 MW solar PV power plant would require between 750 and 2,500 acres.

Utility-scale solar PV installations require land with less than 3 percent 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 2-10 AFY of water is estimated to be required for a 100 MW utility solar PV installation or 10 to 50 AFY for a 250 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 (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 GSEP facility. If utility scale solar PV technology were built at the GSEP site, approximately 750 to 2,500 acres may be required, depending on the technology. The types of impacts from developing a solar PV project at the GSEP site are discussed below.

Development and installation of solar PV at the proposed project site could have adverse impacts to vegetation and wildlife from construction of access roads, transmission lines and any needed ancillary facilities (e.g., substation, water tank and a maintenance building). PV technologies require level ground of less than 3 percent slope; however, as the criteria for the GSEP site was a slope of 3 percent or less, it is expected that less grading would be required to site the PV arrays. Construction of a PV project 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 take decades to recover, if at all. PV facilities could require security fencing; however some projects have proposed fencing that leaves 12 inch spacing from the ground to allow wildlife to enter into the solar array areas to aid in wildlife movement (SLO 2009).

Solar PV facilities would potentially require more land to generate 250 MW than the proposed parabolic trough technology for the GSEP. The amount of ground disturbance for a solar PV facility varies and depends on the PV technology used; however, in order to avoid sensitive resources it is expected that greater amounts of land would be required than with the parabolic trough technology. For example, the California Valley 250 MW solar PV project is proposed on a 4,365 acre site, although only a portion of that would be covered with solar PV arrays (SLO 2009).

The construction activities associated with solar PV development at the GSEP site have the potential to adversely impact surface water quality. During grading and construction activities there is the potential for surface water runoff to carry pollutants and sediment offsite and degrade water quality in nearby waters. Common pollutants that could be introduced into storm water during construction include, but are not limited to, fertilizers from landscape management, petroleum hydrocarbons and heavy metals from construction vehicles. Accelerated wind and water-induced erosion may result from 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. Soils devoid of vegetation have a high potential for erosion, particularly when disturbed.

Because the solar PV technology does not require any water for cooling or steam generation, the technology uses less water during operations than solar concentrating technologies. For certain PV technologies, water is required only for washing the solar PV arrays. Solargen's 420 MW Panoche Valley Solar Farm (2009) would use 10.5 AFY during operation. First Solar's 550 MW Desert Sunlight Solar Farm (thin film) operation water estimates are for domestic purposes (drinking, washing, and toilets) and would be no more than a few hundred gallons per day. However, during construction an estimated 1,800 AFY would be required for soil compaction, dust control and sanitary needs (First Solar 2010).

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 soil and water resources as to those of the GSEP facility. However, a utility scale PV project would reduce impacts to glare and would require minimal water for washing of the PV panels and would require no water use for cooling.

Rationale for Elimination

Utility scale solar PV technology is a viable renewable technology, but it is not retained for analysis because, as stated above, in order for California to meet the renewable portfolio standards, it must have access to all types of renewable technologies. In addition, use of utility scale solar PV would not reduce major impacts of the GSEP facility because the extent of land and access roads required would be similar. Therefore, solar PV technology would not eliminate the impacts of the GSEP associated with ground disturbance. While a utility solar PV alternative would reduce impact from water used during cooling, the Dry Cooling Alternative, retained for consideration for this project would also eliminate this impact. 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 structures such as substations. To be a viable alternative to the proposed GSEP, there would have to be sufficient newly-installed panels to generate 250 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 the different 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-foot 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 250 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 to 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 percent of the city's electricity from renewable energy by 2020 and plans to implement strategies, such as a 24-month period to increase solar installations in San Jose by 15 percent. The City anticipates that City facilities with appropriate solar access including parking lots, garages, lands and landfills would be eligible for solar installation. 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, 75 million square feet (approximately 1,750 acres) would be required for 250 MW.

Riverside County is estimated to have the technical potential for over 3,000 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.[1] The capacity factor depends on a number of factors including the insolation[2] 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 Mojave Desert. The Renewable Energy Transmission Initiative (RETI) assumed a capacity factor of approximately 30 percent for solar thermal technologies and tracking solar PV and approximately 20 percent 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.

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 NextEra 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 250 MW distributed solar PV would require up to 75 million square feet. Distributed solar PV is assumed to be located on already existing structures or disturbed areas so little to no new ground disturbance would be required and there would be few associated biological impacts.

[1] 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)

[2] Insolation is the total amount of solar radiation striking a surface exposed to the sky (CEC 2008a).

Minimal grading or few 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, 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 250 MW, would meet the CEC project objectives to operate 250 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 250 MW to eliminate the need for the Genesis Solar Energy 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 percent RPS standard. The results of this study state that the cost of a high distributed generation case is significantly higher than the other 33 percent 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 presented 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 250 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 GSEP. As a result, this technology is eliminated from detailed analysis in this SA/DEIS.

B.2.8.3 Alternative Renewable Technologies

Non-solar renewable generation technologies were considered as potential alternatives to the proposed 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 at the scale of the GSEP, 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 Riverside 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 and to help develop an reliable supply of renewable energy in California. 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 utilized 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 percent of the wind's kinetic energy into electricity. A single 1.5-MW turbine operating at a 40 percent 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 again has caught up, contributing lower cost, greater reliability, and reason for genuine optimism for this renewable energy source in the future.

The technology is now well developed and can be used to generate significant amounts of power. There are now approximately 2,490 MW of wind being generated in California (AWEA 2008).

Wind Resources at the GSEP Site. Wind resources are not viable at the GSEP site (BLM 2005a). The nearest medium to high wind resources are located immediately north of the GSEP site in a BLM designated wilderness area (BLM 2005a). Development of a wind project in wilderness is not a viable alternative.

San Gorgonio Pass. The nearest viable wind resource area to the GSEP site is the San Gorgonio Pass, northwest of Palm Springs. This is considered one of the best regions in California for producing wind energy. However, there is little undeveloped land remaining for expansion beyond the already existing wind farms (WAPA 2003). Because there is minimal expansion room, the wind industry is instead replacing the older turbines in the region with newer ones, called "repowering" (WAPA 2003). At one time, there were more than 4,000 turbines in the Pass but wind farm operators have been replacing smaller, less efficient machines with larger, more modern turbines that need less maintenance and that can harness (WAPA 2003).

Environmental Assessment. Wind turbines can create environmental impacts, as summarized below (AWEA 2008):

- Wind energy requires between 5 and 17 acres per MW of energy created. As such a nominal 250 MW power plant would require between 1,250 and 4,250 acres. However, wind turbine "footprints" typically occupy only 5 percent 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 significant 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.
- 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 1,250 to 4,250 acres of land would be required for a 250 MW wind electricity power plant. While wind plants would not necessarily impact the same types of wildlife and vegetation as the GSEP plant, the significant acreage necessary for a 250 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.

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 GSEP. Therefore wind generation was eliminated from further consideration.

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 percent 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 percent.

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 RETI Phase 1A Report (2008) estimated an incremental capacity of approximately 2,400 MW for the entire State by 2018.

Geothermal Resources at the GSEP Site. There are no viable geothermal resources at the GSEP site. The nearest medium or high geothermal resources are located in the Salton Sea region.

Geothermal Alternative Scenario. There is no single 250 MW geothermal project that would be viable as an alternative to the GSEP. Approximately 2-7 smaller projects would be required to achieve 250 MW of geothermal energy. The amount of land required for a geothermal facility varies greatly. Two hundred and fifty MW of geothermal energy could require the use of many thousands of acres of land. However, the amount of ground disturbance on that area would be less than 10 percent. Additionally, while components of 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 2-7 geothermal facilities would be required for provision of 250 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 GSEP.

Environmental Assessment. Concerns regarding geothermal power plants include air quality, hazardous materials, and geology. Benefits from geothermal power plants include an increased reliability and less ground disturbance than some renewable resources, including solar.

Air Quality. 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.

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 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.

Hazardous Materials. 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 percent 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).

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.

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).

Land Use. Geothermal power projects require less ground disturbance than almost any other energy source, typically from about 0.2 to 0.5 acres per MW; however, geothermal plants must be built where the resource is since the steam cannot be piped long distances without significant heat loss. This results in a highly secure and predictable fuel supply and some inflexibility in siting. It may also result in a long interconnection requirement to reach a transmission system.

Because of the minimal ground disturbance required, impacts to biological resources and cultural resources would likely be minimized compared to the GSEP.

Reliability. Geothermal facilities may achieve a 95 percent 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.

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 GSEP, so impacts related to biological and cultural resources, water and soils resources, and traffic/transportation would reduced. However, despite the encouragement provided by Renewable Portfolio Standard targets and ARRA funding, few new projects have been proposed 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 percent 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 renewables, the locational flexibility of biomass facilities would reduce the need for significant transmission investments. Solid fuel biomass (555 MW) makes up about 1.75 percent of the state's electricity, and landfill gas generation (260 MW) makes up about 0.75 percent. Existing landfills not now producing electricity from gas could add a maximum of about 170 MW of new generation capacity (CBEA 2008).

Biomass Resources at the GSEP Site. Biomass resources are not viable at the GSEP site (NREL 2009) due to its remote location and distance from the agricultural production areas surrounding Blythe. Transportation of agricultural waste to this site would result in generation of additional vehicle emissions that would offset the potential benefits of using a renewable fuel.

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 in order to minimize the cost and impacts 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 would contribute to existing violations of the PM10 and ozone standards. Biomass/biogas facility emissions could also adversely affect visibility and vegetation in federal Class I areas or state wilderness areas, which would significantly deteriorate air quality related values in the wilderness areas. Toxic air contaminants from routine operation would also cause health risks that could locally adversely affect sensitive receptors.

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 project objectives. Biomass facilities also generate significant air emissions and require numerous truck deliveries to supply the plant with the waste. 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 as an alternative to the GSEP 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 electricity produced. Worldwide, existing power plants 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 straits between the mainland and islands was increasingly considered a viable option for 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 hydroelectric 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 percent 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 the fence.

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; 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. The 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). The Roosevelt Island Tidal Energy (RITE) project completed the Phase 2 Demonstration at the end of 2008. This phase included operating six full-scale turbines and resulted in 70 MW hours of energy delivered to two end users (Verdant 2009). Phase 3 of the RITE project is currently underway, and Verdant Power applied to the Federal Energy Regulatory Commission for a pilot license in November 2008. If granted, this license would allow Verdant Power to build out the RITE Project in the east channel of the East River to a 30-turbine 1 MW pilot project and to commercially deliver the energy generated by the field (Verdant 2009).

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 the 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 environmental impacts on marine systems. The in-flow turbines off New York City underwent environmental monitoring for 18 months to ensure the turbines would not create environmental impacts to the river's marine wildlife. The results thus far show no observed evidence of increased fish mortality or injury; however, Verdant will continue to monitor activities during the Phase 3 build-out of the project to analyze impact from larger arrays (Verdant 2009). 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 creates significant environmental impacts to ocean ecosystems. In-flow tidal turbines are a relatively new technology and are not considered an alternative to the GSEP project because they are an unproven technology at the scale that would be required to replace the proposed project. Additionally, the environmental impacts of tidal turbines are still under review, as demonstrated by the pilot project under continued environmental monitoring in New York. Therefore, this technology is not analyzed in detail in this SA/DEIS as an alternative to the GSEP.

Wave Energy

Wave power technologies have been around 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.

The highest energy waves are concentrated off the western coasts in the 40^{o} to 60^{o} 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 up 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 megawatts. 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 the 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 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). These include (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 reduce 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.
- 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 GSEP 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 GSEP.

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 GSEP: to construct and operate an approximately 250 MW project that would contribute clean, renewable solar energy to the State of California's renewable energy goals.

These generation technologies would not be practical at the GSEP site due to the lack of available fuels at the site and the distance of the site from major access roads. While these generation technologies would not achieve this key objective, nor would they be practical at the GSEP site, they are presented here in brief for the benefit of the public and decision makers. Conservation and demand-side management is also briefly addressed in this section.

The following topics are considered in this analysis:

- natural gas
- coal
- nuclear energy
- conservation and demand-side management

Of the nonrenewable generation alternatives (natural gas, coal, and nuclear), only the 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 and to help develop reliable sources of renewable energy in California. 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 percent of all the energy used in the United States and comprises 40 percent 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 250 MW would generally require less than 50 acres of land.

Environmental Assessment. Natural gas power plants may result in numerous environmental impacts such as the following.

- Overall air quality impacts would increase because natural gas-fired power plants contribute to local violations of PM10 and ozone ambient 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 significant.
- 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.
- In order to avoid land use impacts, natural gas-fired power plants must be consistent with local jurisdiction 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 phase. 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 significantly fewer acres per megawatt of power generated, impacts to cultural resources would be expected to be fewer than with solar facilities.
- Power plant siting may result in the withdrawal of agricultural lands. However, because natural gas power plants require significantly fewer acres per megawatt of power generated, impacts to agriculture would be expected to be less than with solar facilities should they be sited on agricultural lands.
- 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 emission of 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 GSEP.

Coal Generation

Coal-fired electric generating plants are the cornerstone of America's central power system. Traditional coal-fired plants generate large amounts of greenhouse gases. New "clean coal technology" includes a variety of energy processes that reduce air emission 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 percent by 2018. The Clean Coal Power Initiative is now focusing on developing projects that utilize 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 percent of the energy used in California came from coal fired sources; 38 percent of this was generated in state, and 62 percent 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 SB 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 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 emissions of a coal-fired power plant are 2,249 pounds per megawatt hour of carbon dioxide, 13 pounds per megawatt hour of sulfur dioxide and 6 pounds per megawatt hour of nitrogen oxides (EPA 2008a). Net increases in greenhouse gas emissions due to coal-firing in the 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 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.

Nuclear Energy

Due to environmental and safety concerns, California law currently prohibits the construction of any new nuclear power plants in California 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 dispose of permanently 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. This information was published in a report: *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*, published in October of 2007, gives 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.

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 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 in September 2008 (CPUC 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 is important for California's energy future and cost effective energy efficiency is considered as the resource of first choice for meeting California's energy needs. However, with population growth and increasing demand for energy, conservation and demand-management alone is not sufficient to address all of California's energy needs. Additionally, it will not provide the renewable energy required to meet the California Renewable Portfolio Standard requirements, so technologies, like solar thermal generation, would be required.

B.2.9 CONCLUSIONS OF ALTERNATIVES ANALYSIS

In this analysis of the GSEP, 25 alternatives to the proposed GSEP were developed and evaluated. These include six alternative sites, solar and renewable technologies, generation technologies using different fuels, and conservation/demand-side management. Of the 25 alternatives, two 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 Reduced Acreage Alternative and the Dry Cooling Alternative. Additionally the BLM and Energy Commission considered the No Project/No Action Alternative.

The Reduced Acreage Alternative would be half as large as the proposed project and was found to reduce the impacts of the proposed GSEP by approximately 50 percent. It would affect substantially less Mojave fringe-toed lizard habitat, would substantially reduce the geomorphic impacts, and would create no impacts to the Chuckwalla and Palen-McCoy sand corridors. However, as highlighted in the Section C.1 (Air Quality), the Reduced Acreage Alternative would reduce the benefits of the proposed GSEP by approximately 50 percent. While the Reduced Acreage Alternative would meet most project objectives, it is uncertain whether the Reduced Acreage Alternative is

economically feasible at this time. As with the proposed GSEP, a land use plan amendment to the California Desert Conservation Area (CDCA) Plan of 1980 would be required before BLM could issue the ROW grant for the Reduced Acreage Alternative.

The Dry Cooling Alternative was found to have similar impacts for most resource elements. However, it would reduce impacts to groundwater-dependent ecosystems, use substantially less water than the proposed project, and reduce impacts of the visible vapor plumes that the proposed project would create with use of cooling towers. The Dry Cooling Alternative was found to reduce the efficiency of the steam power cycles, which would slightly reduce the total amount of power generated. As a result, the benefits of the GSEP in replacing gas-fired power plants and associated greenhouse gases would be reduced. The Dry Cooling Alternative meets most project objectives. At this time, it appears to be economically feasible as alternative to GESP's use of wet cooling. As with the proposed GSEP, a land use plan amendment to the California Desert Conservation Area (CDCA) Plan of 1980 would be required before BLM could issue the ROW grant for the Dry Cooling Alternative.

One site alternative is evaluated in detail by the Energy Commission in this SA/DEIS under the California Environmental Quality Act (CEQA) only: the Gabrych Alternative site. While the impacts of this site would be similar to those of the proposed site in many resource elements, the alternative site is likely to have less severe cultural impacts and would also have reduced impacts to biological resources.

All six 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 (Stirling engine systems, solar power tower, utility scale solar photovoltaics, and linear Fresnel) were also evaluated. As compared with the proposed GSEP, 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 GSEP. These technologies would either be infeasible at the scale of the GSEP, or would not eliminate substantial adverse impacts caused by the GSEP 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 GSEP. 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.

B.2.10 REFERENCES

AECOM. 2009. Genesis Solar Energy Project Biological Resources Application for Certification. August.

AWEA 2008—American Wind Energy Association. 2004. <http://www.awea.org> Accessed November, 2008.

BBC 2007. "Tidal Barrage moves a step closer." <http://news.bbc.co.uk/2/hi/uk_news/wales/6681113.stm> Accessed January 2010.

BBC 2008. "Severn tidal 'fence' idea floated." <http://news.bbc.co.uk/2/hi/uk_news/wales/7509904.stm>. Accessed January 2010.

BIS 2009—Department of Business Innovation & Skills. 2009. Severn Tidal Power, Feasibility Study. <http://webarchive.nationalarchives.gov.uk/+/http://www.berr.gov.uk//whatwedo/energy/sources/renewables/explained/severntidalpower/thefeasibilitystudy/page46182.html> Accessed, January 2010.

BLM 1998—Bureau of Land Management. 1998. Surface Management Status Desert Access Guide. California Desert District: Borrego Valley.

BLM 1998a—Bureau of Land Management. 1998. Surface Management Status Desert Access Guide. California Desert District: El Centro.

BLM 1999—Bureau of Land Management. 1999. The California Desert Conservation Area Plan 1980 as amended. <http://www.blm.gov/ca/st/en/prog/planning.1.html> Accessed November, 2008.

BLM 2002—Bureau of Land Management. 2002. California Desert Conservation Area Plan Amendment for the Western Colorado Desert Route of Travel Designation Environmental Assessment. <http://www.blm.gov/ca/news/pdfs/weco_2002/weco2002.pdf> Accessed December 11, 2008.

BLM 2005a—Bureau of Land Management. 2005. Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM-Administered Lands in the Western United States. June.

BLM 2006—Bureau of Land Management 2006. Notice of Availability of Decision to Exchange Lands in Imperial, Riverside, and San Bernardino Counties, CA. <http://www.nplnews.com/library/landx/sfpacific/dec52005-decision.pdf> Accessed February 2010.

BLM 2008—Bureau of Land Management. 2008. Imperial Sand Dunes Recreation Area Management Plan Scoping Report. <http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/elcentro/planning/2008/isdra.Par.97215.File.dat/ISDRA_Scoping_Report.pdf> Accessed September 2009.

BLM 2009—Bureau of Land Management. 2009. Geocommunicator. <http://www.geocommunicator.gov/blmMap/Map.jsp?MAP=Energy> Accessed January 29, 2009.

BLM 2009b—Bureau of Land Management. 2009. California Renewable Energy Summary Statistics as of August 2009. < http://www.blm.gov/ca/st/en/prog/energy/solar.html> Accessed September 2009.

BLM 2009c—Bureau of Land Management. 2009. Solar Energy Application – CDD Updated 02/09.

BLM 2009d—Bureau of Land Management. 2009. Solar Energy Development Programmatic EIS Solar Energy Study Area Maps. <http://www.solareis.anl.gov/news/index.cfm#SESAMaps> Accessed September 2009.

BLM 2010—Bureau of Land Management. 2010. Geocommunicator Mining Claims map. <http://www.geocommunicator.gov/blmMap/Map.jsp?MAP=Mining Claims> Accessed February 2010.

Blythe GP 2007—City of Blythe General Plan 2025. March 2007. <http://www.cityofblythe.ca.gov/DocumentCenterii.aspx> Accessed January 2010.

Boehlert, G.W, G.R. McMurray, and C.E. Tortorini (editors). 2008. Ecological effects of wave energy in the Pacific Northwest. U.S. Dept. Commerce, NOAA Tech. Memo. NMFS-F/SPO-92.

California Department of Fish and Game. 2009. California Natural Diversity Database (CNDDB). November.

Caltrans 2002—2002 Imperial County Transportation Plan Highway Element. <http://www.dot.ca.gov/dist11/departments/planning/pdfs/02_IC_TransportationPlan.PDF> Accessed September, 2009.

Cannon 2008—Cannon Solar Partners, LLC. 2008. Solar Energy Plan of Development. 10/2/2008.

Carrizo 2007—Carrizo Energy, 2007. Application for Certification (07-AFC-8) for the Carrizo Energy Solar Farm. Submitted to the California Energy Commission 10/25/07.

CCR 2006. California Code of Regulations, Title 14, Chapter 3 (CEQA Guidelines), §§15000-15387, as amended July 11, 2006.

CBEA 2006—California Biomass Energy Alliance. 2006. Bioenergy Plan for California. <http://www.calbiomass.org/technical.htm> Accessed April 2008.

CCR 2006. California Code of Regulations, Title 14, Chapter 3 (CEQA Guidelines), §§15000-15387, as amended July 11, 2006.

CDBW 2010—California Department of Boating and Waterways. 2010. Colorado River Boating Trail Guide Blythe to Imperial Dam. <http://www.dbw.ca.gov/Pubs/BlythetoImperial/BlythetoImperial.pdf> Accessed February 2010.

CEC 2003—California Energy Commission. 2004. Final Staff Assessment Salton Sea Geothermal Unit #6 Power Project (02-AFC-2).

CEC 2005—California Energy Commission. 2005. California Geothermal Resources. CEC-500-2005-070. <http://www.energy.ca.gov/2005publications/CEC-500-2005-070/CEC-500-2005-070.PDF> Accessed April, 2008.

CEC 2006—California Energy Commission. 2006. Nuclear Energy in California. <http://www.energy.ca.gov/nuclear/california.html> Accessed April, 2008.

CEC 2007—California Energy Commission. 2007. 2007 Integrated Energy Report. CEC-100-2007-008-CTF.

CEC 2007a—California Energy Commission. 2007. Nuclear Power in California: 2007 Status Report.

CEC 2007b—California Energy Commission. 2007. California Rooftop Photovoltaic (PV) Resource Assessment and Growth Potential by County. CEC-500-2007-048

CEC 2008—California Energy Commission. 2008. Geothermal Energy in California. <http://www.energy.ca.gov/geothermal/> Accessed November, 2008.

CEC 2008a—California Energy Commission. 2008. California Concentrating Solar Power Prospects. <http://www.energy.ca.gov/maps/Solar_Resource_Potential.pdf> Accessed July, 2009.

CEC 2010a—California Energy Commission and Bureau of Land Management. 2010. Staff Assessment and Draft Environmental Impact Statement for the Blythe Solar Power Project. Published March 11, 2010.

CEC 2010b—California Energy Commission and Bureau of Land Management. 2010. Staff Assessment and Draft Environmental Impact Statement for the Palen Solar Power Project. Published March18, 2010.

CEQ Forty Questions, 1A. 2008. Accessed at: http://www.nepa.gov/nepa/regs/40/1-10.HTM#1 November.

CEQANET 2009—CEQAnet Database. <http://www.ceqanet.ca.gov/ProjDocList.asp?ProjectPK=595797> Accessed March 19, 2009.

CERES 2009—California Environmental The Colorado Desert – An Overview. <http://www.ceres.ca.gov/geo_area/bioregions/Colorado_Desert/about.html> Accessed July 2009.

CERES (California Environmental Resources Evaluation System). 2010. California's Bioregions. http://www.ceres.ca.gov/geo_area/bioregions/Colorado_Desert/about.html. Accessed January 4, 2010.

CPUC 2006—California Public Utilities Commission. 2006. Devers-Palo Verde No. 2 Transmission Line Project Final EIR/EIS. <http://www.cpuc.ca.gov/Environment/info/aspen/dpv2/toc-feir.htm> Accessed January 2010.

CPUC 2008—California Public Utilities Commission. 2008. Energy Division Resolution E-4196. <http://docs.cpuc.ca.gov/Published/Comment_resolution/90830.htm> Accessed November, 2008.

CPUC 2008a—California Public Utilities Commission. 2008. California Long Term Energy Efficiency Strategy Plan. <http://www.californiaenergyefficiency.com/docs/EEStrategicPlan.pdf> Accessed November, 2008.

CPUC 2008b—California Public Utilities Commission. 2008. Final Environmental Impact Report/Environmental Impact Statement and Proposed Land Use Amendment Sunrise Powerlink Project. < http://www.cpuc.ca.gov/environment/info/aspen/sunrise/toc-feir.htm> Accessed July, 2009.

CPUC 2009—California Public Utilities Commission. 2009. California Solar Initiative Annual Program Assessment to the Legislature – June 2009. <http://www.cpuc.ca.gov/PUC/energy/Solar/apa09.htm> Accessed September 2009.

CWR 2010—Chuckwalla Valley Raceway. 2010. <http://ti2tt.com/ti/ti2tt/content/track11.html>. Accessed February, 2010.

DOC 1997. California Department of Conservation, Office of Land Conservation. California *Agricultural Land Evaluation and Site Assessment Model* (Instruction Manual). 1997.

DOC 2008—Department of Conservation. 2008. Riverside County Important Farmland 2008 Sheet 3 or 3. <ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2008/riv08_east.pdf>. Accessed January 2010.

DOE 2008—Department of Energy. 2008. Clean Coal Technology & the President's Clean Coal Power Initiative. <http://fossil.energy.gov/programs/powersystems/cleancoal/> Accessed November, 2008.

EDAW AECOM. 2009. Genesis Solar Energy Project Biological Resources Technical Report, Riverside County, California. August.

EERE 2008—Energy Efficiency and Renewable Energy. 2008. Annual Report on U.S. Wind Power Installation, Cost, and Performance Trends: 2008.

Envirostor 20010—Department of Toxic Substances Control Envirostor Database. < http://www.envirostor.dtsc.ca.gov/public/map.asp?global_id=19300231> Accessed January 2010.

EPRI 2006—Electric Power Research Institute. 2006. North America Tidal In-Stream Energy Conversion Technology Feasibility Study. EPRI TP-008-NA <http://oceanenergy.epri.com/attachments/streamenergy/reports/008_Summary_Tidal_Report_06-10-06.pdf> Accessed April, 2008.

EPRI 2006a—Electric Power Research Institute. 2006. System Level Design, Performance, Cost and Economic Assessment – San Francisco Tidal In-Stream Power Plant.

Fairley, Peter. 2007. Tidal Turbines Help Light Up Manhattan. <http://www.technologyreview.com/energy/18567/page2/>. Accessed November, 2008.

FS 2008—US Forest Service. 2008. BLM – Imperial Sand Dunes Recreation Area Non-Commercial, Individual, Special Permit Adjustment Proposal. <http://www.fs.fed.us/r5/passes/rrac/meetings/january2008/blm4.php> Accessed September 2009.

GEA 2007—Geothermal Energy Association. 2007. A Guide to Geothermal Energy and the Environment. <http://www.geo-energy.org/publications/reports/Environmental%20Guide.pdf> Accessed November, 2008.

Imperial County 2007. Imperial County Land Use Plan Updated March 1, 2007. <http://www.icpds.com/CMS/Media/LANDUSE-Map.pdf> Accessed February 2010.

Imperial County 2009. Joint Resolution of the Imperial Irrigation District and County of Imperial for the Creation of an Imperial Valley Renewable Energy Development Program. < http://www.co.imperial.ca.us/supervisors-agendas/2009/RESOLUTIONS/029%20CEO.pdf> Accessed August 2009.

Kagel, et al. 2007. “A Guide to Geothermal Energy and the Environment.” Geothermal Energy Association, Washington, D.C. April 2007. Accessed July 28, 2009. <www.geo-energy.org/publications/reports/Environmental%20Guide.pdf>.

National Park Service 2010—Joshua Tree Park History. <http://www.nps.gov/jotr/historyculture/parkhistory.htm>. Accessed February 2010.

Nevada SolarOne. 2008. <http://www.nevadasolarone.net/the-plant> Accessed November 11, 2008.

NRCS 2009. Federal Protection Policy Act- Purpose. [online]: http://www.nrcs.usda.gov/programs/fppa/. Accessed April 22, 2009

NRDC 2008a—Natural Resources Defense Council. 2008. Energy Facts: Solar Trough. <http://www.energy.ca.gov/reti/steering/2008-06-18_meeting/SOLAR_FS-Solar_Trough.pdf> Accessed: September, 2008.

NRDC 2008b—Natural Resources Defense Council. 2008. Energy Facts: Compact Linear Fresnel Reflector. <http://www.energy.ca.gov/reti/steering/2008-06-18_meeting/SOLAR_FS-Compact_Linear_Fresnel_Reflector.pdf> Accessed September, 2008.

NRDC 2008c—Natural Resources Defense Council. 2008. Energy Facts: Utility-Scale Photovoltaic (PV). <http://www.energy.ca.gov/reti/steering/2008-06-18_meeting/SOLAR_FS-Utility-Scale_Photovoltaic.pdf> Accessed October, 2008.

NREL 2009—National Renewable Energy Lab. State Assessment for Biomass Resources: California Potential Biofuel Production. <http://www.afdc.energy.gov/afdc/sabre/sabre.php?state=California> Accessed March 2010.

OES 2002—Governor’s Office of Emergency Services. 2002. Hazardous Materials Spill Report. <http://rimssouthern.oes.ca.gov/Archive/malhaz22.nsf/498d895aa750af4e8825659c006cf303/799729f51a684feb88256b3800595c6b?OpenDocument> Accessed February 2010.

Osborne, Peter 2000. Electricity from the Sea. Originally published in September 1998, web version updated in July 2000. <http://www.fujitaresearch.com/reports/tidalpower.html> Accessed November, 2008.

Powers 2007. San Diego Smart Energy 2020: The 21st Century Alternative. Prepared by: E-Tech International, Santa Fe, New Mexico. October 2007.

RETI 2008—Renewable Energy Transmission Initiative. 2008. RETI – Phase 1B Resource Maps: CREZ Map. <http://www.energy.ca.gov/reti/documents/phase1B/maps/CREZ_Map.pdf> Accessed January 29, 2010.

Riverside County 2003—General Plan Foundation Components and Land Use Designations. <http://www.rctlma.org/genplan/content/area_maps.aspx> Accessed February, 2010.

Sempra 2008—Nevada officials help dedicate Sempra Energy's first solar power installation. <http://public.sempra.com/newsreleases/viewPR.cfm?PR_ID=2330&Co_Short_Nm=SE> Accessed January 28, 2009.

SES 2008—Stirling Energy Systems. 2008. Application for Certification SES Solar 2, LLC. Submitted to California Energy Commission 6/30/2008.

Solel. 2008. <http://www.solel.com/products/pgeneration/ls2/kramerjunction/> Accessed November 11, 2008.

STB 2009—Surface Transportation Board. 2009. Surface Transportation Board Decision Document: Arizona & California Railroad Company—Abandonment Exemption—In San Bernardino and Riverside Counties, CA. <http://www.stb.dot.gov/decisions/readingroom.nsf/fc695db5bc7ebe2c852572b80040c45f/f2b2222848c9fc8b852575e400664e0a?OpenDocument> Accessed January 2010.

STB 2010—Surface Transportation Board. 2010. < http://www.stb.dot.gov/decisions/readingroom.nsf/fc695db5bc7ebe2c852572b80040c45f/2117ba7971437a22852576ab004b3788?OpenDocument. Accessed January 2010.

USBR 2007—United States Bureau of Reclamation. 2007. Lower Colorado River Drop 2 Storage Reservoir Project Final Environmental Assessment. <http://www.usbr.gov/lc/region/programs/drop2/envdocs/index.html> Accessed September 2009.

USDA 2009—United States Department of Agriculture. 2009. Natural Resources Conservation Service Web Soil Survey. <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx> Accessed July 2009.

USDOE 2008—United States Department of Energy. 2008. United States Department of Energy and United States Department of the Interior. Notice of Intent to Prepare a Programmatic Environmental Impact Statement (PEIS) to Evaluate Solar Energy Development, Develop and Implement Agency-Specific Programs,

Conduct Public Scoping Meetings, Amend Relevant Agency Land Use Plans, and Provide Notice of Proposed Planning Criteria. Dated on 5/23/2008.

USEPA 2008—United States Environmental Protection Agency. 2008. Region 9: Air Programs. <http://www.epa.gov/region09/air/maps/r9_co.html> Accessed November, 2008.

USEPA 2008a—United States Environmental Protection Agency. 2008. Clean Energy Water Resource Use and Air emissions <http://www.epa.gov/cleanenergy/energy-and-you/affect/water-resource.html> Accessed November, 2008.

USFWS 2010—United States Fish and Wildlife Service. Cibola National Wildlife Refuge. <http://www.fws.gov/Refuges/profiles/index.cfm?id=22540> Accessed February 2010.

USGS 2008—United States Geologic Survey. 2008. National Geologic Map Database. <http://ngmdb.usgs.gov/ngm-bin/ILView.pl?sid=454_1.sid&vtype=b> Accessed July, 2008.

Verdant 2009—Verdant Power. 2009. The RITE Project. <http://verdantpower.com/what-initiative/>. Accessed October, 2009.

Walsh, Bryan 2009. Catching the Currents. <http://www.time.com/time/specials/packages/article/0,28804,1872110_1872133_1872147,00.html> Accessed March 19, 2009.

WAPA 2003—No Room to Grow, San Gorgonio Pass, Calif., Area Wind Mill Industry Evolves. <http://www.wapa.gov/es/greennews/2003/mar17%2703.htm> Accessed January 2010.

WEC 2001—World Energy Council. 2001. WEC Survey of Energy Resources 2007 – Wave Energy. <http://www.worldenergy.org/publications/survey_of_energy_resources_2007/wave_energy/761.asp> Accessed April, 2008.

Whitney, Ryan. 2007. Nellis activates Nations largest PV Array. <http://www.nellis.af.mil/news/story_print.asp?id=123079933> Accessed November, 2008.

WTE 2009—Wave & Tidal Energy. 2009. Study on the effects of turbines on sea life launched. <http://www.wave-tidal-energy.com/home/news-archive/36-research/167-study-on-the-effects-of-turbines-on-sea-life-launched> Accessed March 19, 2009.

FIGURES FOR ALTERNATIVES SECTION (FOLLOWING THIS PAGE)

Alternatives Figure 1: Reduced Acreage Alternative

Alternatives Figure 2: Dry Cooling Alternative Layout

APPENDICES TO ALTERNATIVES SECTION

1. List of bio species on Gabrych Alternative
2. LESA model results for Gabrych Alternative

APPENDIX A
Sensitive Species Potentially Occurring in the Vicinity of the Genesis Solar Project and Potential Alternatives

Species	Sensitivity Status	Habitat	Potential to Occur / Status on Site		
			Proposed Project Site[1]	Reduced Acreage Alternative	Gabrych Alternative
PLANTS					
Angel trumpets *(Acleisanthes longiflora)*	Federal – None State – None CNPS List 2.2	Sonoran Desert Scrub generally on limestone, mountains or base of mountains at elevations of 0-2500 m. Blooms April through May.	None – no limestone or rocky habitat; not observed. Two occurrences in CA from 1906 and 1970 at same location at base of Big Maria Mts, north of Blythe; to TX and northern MX.	Very low. Suitable habitat does not exist on site.	Very low. Suitable habitat does not exist on site.
Chaparral sand verbena (*Abronia villosa* var. *aurita*)	Federal – None State – None CNPS – 1B.1	Found in chaparral, coastal sage scrub, and desert dunes, loose to aeolian sands at elevations of 80-1600m. Blooms January through September.	Highly unlikely/Not observed	Low. Very little suitable habitat exists on site.	Low. Very little suitable habitat exists on site.
Desert sand-parsley (*Ammoselinum giganteum*)	Federal – None State – None CNPS List 2.3	Sonoran Desert, in creosote bush scrub, desert mesa and valley bottoms in open to heavy soils under shrubs 396 m. Herbaceous annual that blooms March through April.	Highly unlikely, but possible. Not observed. Known from one site, near Hayfield Dry Lake at 366 m.	Moderate. Suitable habitat exists on site.	Very low. Suitable habitat does not exist on site.
Small-flowered androstephium (*Androstephium breviflorum*)	Federal – None State – None CNPS List 2.2	Perennial herb, primarily found in open sandy flats and bajadas, often stabilized blowsand, at low to moderate elevations (between 270 and 640m). Blooms in March possibly through May. Relatively short period of active growth, distribution in California poorly documented.	Would not be expected – all known locations well to north and generally higher; not observed.	Low. Suitable habitat on site, however site elevation likely to low.	Low. Suitable habitat on site, however site elevation likely to low.

Species	Sensitivity Status	Habitat	Potential to Occur / Status on Site		
			Proposed Project Site[1]	Reduced Acreage Alternative	Gabrych Alternative
Harwood's milkvetch (*Astragalus insularis* var. *harwoodii*)	Federal – None State – None CNPS List 2.2	Sonoran Desert, sandy to gravelly areas 0 to 366 m. Annual that blooms January through May	Observed during surveys	Moderate to high. Suitable habitat exists on site but species was not observed during rare plant surveys.	Low. Little suitable habitat occurs on site.
Coachella Valley milkvetch (*Astragalus lentiginosus* var. *coachellae*)	Federal – Endangered State – None CNPS List 1B.2	Sonoran Desert, in sandy areas growing at elevations of 0 to 350m. Annual or perennial herb that flowers February through May.	Highly unlikely; no known nearby populations (population in Chuckwalla Valley misidentified)/Not observed	Low. No known nearby populations.	Very low. Suitable habitat does not exist on site.
Ayenia (*Ayenia compacta*)	Federal – None State – None CNPS List 2.3	Sandy and gravelly washes and canyons in desert scrubs, 150 – 1095m. Blooms March through April.	Possible/Not observed	Moderate. Suitable habitat exists on site, but site is just below the low end of the species' elevation range.	Very low. Suitable habitat does not exist on site.
Pink fairyduster (*Calliandra eriophylla*)	Federal – None State – None CNPS List 2.3	Sonoran Desert, sandy washes, slopes, and mesas typically found at ± 1500m. Shrub <1 foot in height; blooms March through April.	Possible/Not observed	Moderate. Suitable habitat exists on site.	Very low. Suitable habitat does not exist on site.
Sand evening primrose (*Camissonia arenaria*)	Federal – None State – None CNPS List 2.2	Sandy washes and rocky slopes below 900 m. Blooms November through May.	Possible/Not observed	Moderate. Suitable habitat exists on site.	Very low. Suitable habitat does not exist on site.
Crucifixion thorn (*Castela emoryi*)	Federal – None State – None CNPS List 2.3	Mojavean and Sonoran desert scrub on dry, gravelly washes, slopes, plains ±650m Shrub <10 feet in height; blooms April through May.	Unlikely/Not observed	Low. Habitat is suitable but site elevation is too low.	Very low. Suitable habitat does not exist on site.
Abram's spurge (*Chamaesyce abramsiana*)	Federal – None State – None CNPS List 2.2	Sandy sites in Mojavean and Sonoran Desert Scrubs in eastern California; 0 – 915m. Blooms September through November.	Possible/Not observed	Moderate. Suitable habitat exists on site.	Low. Little suitable habitat occurs on site.
Arizona spurge (*Chamaesyce arizonica*)	Federal – None State – None CNPS List 2.3	Sandy flats in Sonoran Desert Scrub below ~ 300m. Blooms March through April.	Possible/Not observed	Moderate. Suitable habitat exists on site.	Low. Little suitable habitat occurs on site.

Species	Sensitivity Status	Habitat	Potential to Occur / Status on Site		
			Proposed Project Site[1]	Reduced Acreage Alternative	Gabrych Alternative
Flat-seeded spurge (*Chamaesyce platysperma*)	Federal – None State – None CNPS List 2	Sandy flats in Sonoran Desert Scrub below ~ 100m. Blooms February through September.	Possible/Not observed	Moderate. Suitable habitat exists on site.	Low. Little suitable habitat occurs on site.
Las Animas colubrine (*Colubrina californica*)	Federal – None State – None CNPS List 2.3	Sonoran Desert creosote bush scrub <1100m in deeper, well incised washes. Plants are generally <1 m in height; blooms June through July.	Observed north of project area in Zone of Influence surveys	Moderate. Some suitable habitat occurs on site.	Very low. Suitable habitat does not exist on site.
Spiny abrojo (*Condalia globosa* var. *pubescens*)	Federal – None State – None CNPS List 4.2	Sonoran Creosote Bush Scrub, 150 to 1000m. Blooms March through May.	Possible/Not observed	Moderate. Suitable habitat exists on site.	Low. Little suitable habitat occurs on site.
Foxtail cactus (*Coryphantha alversonii*)	Federal – None State – None CNPS List 4.3	Primarily rocky substrates between 75 and 1200m in Creosote Bush Scrub.	Possible/Not observed	Moderate. Suitable habitat exists on site.	Very low. Suitable habitat does not exist on site.
Winged cryptantha *(Cryptantha holoptera)*	Federal – None State – None CNPS List 4.3	CNPS: 100-1690 m, Moj. And Son. D. scrubs; Jepson: 100-1200 m in eastern Moj. And Son. D.; sandy to rocky soils; creosote bush scrub San Diego to Inyo Cos., including Los Angeles, San Bernardino, Riverside, and Imperial Cos., to AZ, NV, and Sonora, MX.	Possible, but not observed. CalFlora has 11 Riverside Co. records, 9 Imperial Co. records, and 7 San Bernardino Co. records, none within miles of the Genesis Project. (Note: The NECO Plan stated that there were no records in the NECO Planning Area and there are no nearby records in the CNDDB data base. However, there is a 1992 location near McCoy Spring.)	Moderate. Suitable habitat exists on site.	Low. Little suitable habitat occurs on site.

Species	Sensitivity Status	Habitat	Potential to Occur / Status on Site		
			Proposed Project Site[1]	Reduced Acreage Alternative	Gabrych Alternative
Wiggins' cholla (*Cylindropuntia wigginsii*)	Federal – None State – None CNPS List 3.3	Sonoran Creosote Bush Scrub; 30 – 900m. Blooms in March.	Possibly observed during surveys.	Moderate. Suitable habitat exists on site.	Very low. Suitable habitat does not exist on site.
Glandular ditaxis (*Ditaxis claryana*)	Federal – None State – None CNPS List 2.2	Sonoran Desert at elevations <465m in sandy soils in creosote bush scrub Annual or perennial herb; blooms from December through May.	Possible/Not observed	Moderate. Suitable habitat exists on site.	Very low. Suitable habitat does not exist on site.
California ditaxis (*Ditaxis serrata* var. *californica*)	Federal – None State – None CNPS List 3.2	Sonoran creosote bush scrub from 30 – 1000 m. Blooms March through December.	Possible/Not observed	Moderate. Suitable habitat exists on site.	Very low. Suitable habitat does not exist on site.
Harwood's phlox (*Eriastrum harwoodii*)	Federal – None State – None CNPS List 1B.2	Desert slopes below 2200m, eastern Riverside and San Bernardino Counties.	Possibly observed during Zone of Influence surveys; however, now flower to positively ID	Moderate. Suitable habitat exists on site.	Very low. Suitable habitat does not exist on site.
Bitter hymenoxys *(Hymenoxys odorata)*	Federal – None State – None CNPS List 2	Sandy flats near the Colorado River. An annual herb producing a branching stem to a maximum height near 60 centimeters. Blooms February to November.	Highly unlikely – known only from the Colorado River alluvial plain; not observed	Very low. Known only from the Colorado River alluvial plain.	Moderate. Site is adjacent to the Colorado River and supports some potentially suitable habitat. CNDDB records for this species occur 2.5 miles west, near Palo Verde.
Pink velvet-mallow (*Horsfordia alata*)	Federal – None State – None CNPS List 4.3	Perennial subshrub, Sonoran Desert at elevations of 100–500 m. in rocky canyons, creosote-bush scrub, washes. Blooms from Mar–Apr, Nov–Dec	None – no rocky habitat on project; not observed	Low to moderate. Suitable habitat (creosote bush scrub) occurs on site, though species was not observed during surveys.	Very low. Suitable habitat does not exist on site.
Spearleaf (*Matelea parvifolia*)	Federal – None State – None CNPS List 2.3	Rocky ledges and slopes, 440 to 1095m, in Mojave and Sonoran Desert Scrubs. Blooms March through May.	Unlikely; no habitat/Not observed	Very low. Suitable habitat does not exist on site.	Very low. Suitable habitat does not exist on site.

Species	Sensitivity Status	Habitat	Potential to Occur / Status on Site		
			Proposed Project Site[1]	Reduced Acreage Alternative	Gabrych Alternative
Argus blazing star (*Mentzelia puberla*)	Federal – None State – None CNPS List 2	Perennial herb found on rocky or gravelly sites in creosote bush scrub below 760m. Ord/Chocolate Mountains to AZ and northern Mexico. Blooms from March – May.	Highly unlikely based on habitat and range; not observed.	Low. Outside of known range.	Very low. Suitable habitat does not exist on site.
Slender woolly-heads (*Nemacaulis denudate* var. *gracilis*)	Federal – None State – None CNPS List 2.2	Dunes in coastal and Sonoran Desert scrubs, primarily in the Coachella Valley; below 400m. Blooms April-May.	Possible/Not observed	Low to moderate. A small amount of suitable habitat exists on site.	Very low. Suitable habitat does not exist on site.
Lobed ground-cherry (*Physalis lobata*)	Federal – None State – None CNPS List 2.3	Mojave desert scrub (decomposed granite) and playas at elevations of 500-800 m. Blooms September-January.	None – all known locations well to north and at higher elevations than project.	Low. Outside of known elevation and geographic range.	Very low. Suitable habitat does not exist on site and site is outside of known range.
Desert portulaca (*Portulaca halimoides*)	Federal – None State – None CNPS List 4.2	Sandy washes and flats in desert mountains at 1000-1200 m. Blooms in September.	None – No habitat and project elevations too low.	Low. Suitable habitat on site, however elevations likely too low.	Very low. Suitable habitat does not exist on site and site is outside of known elevation range.
Desert unicorn plant (*Proboscidea althaeifolia*)	Federal – None State – None CNPS – None	Sandy areas in Sonoran Desert Scrub throughout southeastern California, below 1000m. Blooms May-August.	Observed during surveys.	Present on site.	Low. Some suitable habitat on site.
Orocopia sage (*Salvia greatae*)	Federal – None State – None CNPS List 1B.3 BLM	Mojavean and Sonoran Desert Scrub; gravelly/rocky bajadas, mostly near washes; below 825m. Blooms March-April.	Unlikely/Not observed	Low to moderate. Some suitable habitat exists on site.	Very low. Suitable habitat does not exist on site.
Coves' cassia (*Senna covesii*)	Federal – None State – None CNPS List 2.2	Dry, sandy desert washes, slopes of the Sonoran Desert between 305 to 1070m. Small perennial shrub to 2 feet tall; blooms March-June.	Possible, but elevations may be too low/Not observed	Low. Suitable habitat on site, however elevations likely too low.	Very low. Suitable habitat does not exist on site.
Mesquite neststraw (*Stylocline sonorensis*)	Federal – None State – None CNPS List 1A	Open sandy drainages; known from one site near Hayfield Spring at 425m. Blooms in April.	Highly unlikely; not observed	Low to moderate. Some suitable habitat exists on site.	Very low. Suitable habitat does not exist on site.

Species	Sensitivity Status	Habitat	Potential to Occur / Status on Site		
			Proposed Project Site[1]	Reduced Acreage Alternative	Gabrych Alternative
Dwarf germander (*Teucrium cubense* ssp. *depressum*)	Federal – None State – None CNPS List 2.2	Sandy soils, washes, and fields in the Sonoran Desert below 366m. Annual plants up to 6 inches tall; blooms from March through May	Possible/Not observed	Moderate. Suitable habitat exists on site and CNDDB records for this species occur approximately 4 miles to the southeast.	Low. Little suitable habitat occurs on site.
Jackass-clover (*Wislizenia refracta* ssp. *Refracta*)	Federal – None State – None CNPS List 2.2	Sandy washes, roadsides, and alkaline flats in the Mojave Desert and northern Sonoran Desert between 790 to 820 m. Annual; blooms April through November	Unlikely – elevations too low on the site/Not observed	Low. Suitable habitat on site, however elevations likely too low.	Low. Suitable habitat on site, however elevations likely too low.
AMPHIBIANS					
Couch's spadefoot (*Scaphiopus couchii*)	Federal – None State – SSC BLM sensitive	Various arid communities in extreme southeastern California; breeds in temporary rain-filled pools	Possible, but not observed.	Low to moderate. Some potentially suitable habitat exists on site.	Low to moderate. Some potentially suitable habitat exists on site. CNDDB records for this species occur approximately 3 mile west of the site.
REPTILES					
Desert tortoise (*Gopherus agassizii*)	Federal – Threatened State – Threatened BLM – None	Found in various desert scrubs and desert washes up to 5,000 feet	Carcass, carcass fragments, burrows, and tracks only observed during surveys.	Moderate. Suitable habitat occurs on site but no recent activity was observed during surveys, only old bone fragments.	Very low. Suitable habitat does not exist on site.
Desert rosy boa (*Charina trivirgata gracia*)	Federal – None State – None BLM Sensitive	Rocky uplands and canyons; often near stream courses	Unlikely due to lack of habitat	Very low. Suitable habitat does not exist on site.	Very low. Suitable habitat does not exist on site.
Colorado Desert fringe-toed lizard (*Uma notata*)	Federal – None State – SSC BLM Sensitive	Restricted to aeolian sandy habitats in the Sonoran Desert	Possible hybrids with *U. scoparia*/Possibly observed	Low. Little suitable habitat occurs on site.	Low. Little suitable habitat occurs on site.

Species	Sensitivity Status	Habitat	Potential to Occur / Status on Site		
			Proposed Project Site[1]	Reduced Acreage Alternative	Gabrych Alternative
Mojave fringe-toed lizard (*Uma scoparia*)	Federal – None State – SSC BLM Sensitive	Restricted to aeolian sandy habitats in the Mojave and northern Sonoran Desert	Observed during surveys	Low. Little suitable habitat occurs on site.	Low. Little suitable habitat occurs on site.
BIRDS					
Golden eagle[2] (*Aquila chrysaetos*)	Federal – None State – Fully Protected BLM – None	Nesting occurs on cliff ledges or in trees on steep slopes, with foraging occurring primarily in grassland and sage scrub.	Possible forager on site, may nest in adjacent mountains/Not observed	High. Suitable foraging habitat/prey exists on site, and suitable nesting habitat is plentiful in nearby mountains.	Very low. Suitable habitat does not exist on site, proximity to development would be a deterrent for foraging.
Short-eared owl (*Asio flammeus*)	Federal –none State – SSC BLM – None	Open habitats; nests marshes, fields; nests on ground and roosts on ground and low poles	Observed during surveys	High. Species observed approximately 4 miles to the west.	Low to moderate. May use site for foraging.
Western burrowing owl (*Athene canicularia hypugaea*)	Federal – None State – SSC BLM sensitive	Found mainly in grassland and open scrub from the seashore to foothills. Also found in deserts and scrublands. Strongly associated with the burrows of ground squirrels or other fossorial mammals.	Observed during surveys	High. Suitable habitat exists on site. Inactive burrows observed.	Moderate. Suitable foraging habitat and potential for burrows occurs on site.
Ferruginous hawk *(Buteo regalis)*	Federal – None State – CDFG Watch List (wintering) BLM – None	Open country, primarily plains, prairies, badlands, sagebrush, shrubland, desert.	Observed incidentally.	High. Suitable foraging habitat exists on site.	High. Suitable foraging habitat exists on site. Species observed foraging over agricultural fields approximately 3 miles north of the alternative site.
Mountain plover (*Charadrius montanus*)	Federal –BCC State – SSC BLM – Sensitive	Occurs in dry upland habitats, short-grass prairies and is a winter migrant in agricultural areas.	Highly unlikely, but possible winter visitor on Ford Dry Lake and adjacent shore	Low to moderate. Suitable habitat occurs on site.	Moderate potential for occurring in agricultural areas during winter.
Northern harrier (*Circus cyaneus*)	Federal – None State – SSC BLM – None	Open habitats; nests in shrubby open land and marshes	Observed during surveys	High. Suitable foraging habitat/prey exists on site	Present. Observed during surveys.

Species	Sensitivity Status	Habitat	Potential to Occur / Status on Site		
			Proposed Project Site[1]	Reduced Acreage Alternative	Gabrych Alternative
American peregrine falcon (*Falco peregrinus anatum*)	Federal – Delisted BCC State – Fully Protected BLM – sensitive	Dry, open country, including arid woodlands; nests in cliffs	Possible forager on site, may nest in adjacent mountains/Not observed	High. Suitable foraging habitat/prey exists on site, and suitable nesting habitat is plentiful in nearby mountains	Low to moderate potential for foraging on site.
Greater sandhill crane[2] (*Grus canadensis*)	Federal – None State – Threatened BLM – None	Sandhill cranes are primarily birds of open fresh water wetlands; they occur at their highest breeding density in habitats that contain open sedge meadows in wetlands that are adjacent to short vegetation in uplands. Rural farm fields may attract foraging cranes.	Very low. No suitable habitat on site.	Very low. No suitable habitat on site.	Moderate. Two cranes were observed flying overhead approximately 0.25 miles west of the site during the field reconnaissance and this species is known to overwinter in the Cibola National Wildlife Refuge approximately 3 miles south of the site.
Yellow-breasted chat (*Icteria virens*)	Federal – None State – SSC BLM – None	Dense streamside thickets, willows; brushy hillsides and canyons	Highly unlikely due to lack of habitat, but possible transient/Not observed	Very low. No suitable habitat exists on site.	Moderate in dense riparian areas along the river. Not expected on agricultural lands.
Loggerhead shrike (*Lanius ludovicianus*)	Federal –BCC State – SSC BLM – None	Occurs in semi-open country with utility posts, wires, and trees to perch on. Although declining over most of the range in California and elsewhere, and now absent over large areas, this species is still common in the California deserts.	Observed during surveys	High. Suitable foraging habitat/prey exists on site	High. Suitable foraging habitat/prey exists on site. Observed perching approximately 2 miles west of the site.

Species	Sensitivity Status	Habitat	Potential to Occur / Status on Site		
			Proposed Project Site[1]	Reduced Acreage Alternative	Gabrych Alternative
Gila woodpecker[2] (*Melanerpes uropygialis*)	Federal – None State – SE BLM – None	Formerly numerous along the Colorado River and less abundant in the Imperial Valley. Non-migratory species that nests in cavities in riparian groves that provide ample shade trees such as cottonwoods, date palms, palo verde, honey mesquite, and desert ironwood (Edwards and Schnell 2000). Requires live tree-size cactus or dead trees (Winkler et al. 1995). In California, the primary factor in determining the presence of this woodpecker is the availability of excavatable tree trunks for nesting (Grinnell and Miller 1944).	Very low. No suitable habitat exists on site.	Very low. No suitable habitat exists on site.	Moderate in riparian areas along the Colorado River. Not expected on agricultural lands.
Vermillion flycatcher[2] (*Pyrocephalus rubinus)*	Federal – None State – SSC BLM – None	Found in the arid Southwest, occurring almost exclusively near water. Favors wooded groves of cottonwood, willow, oak, mesquite, and sycamore bordering rivers, especially near open, brushy, grassy, or agricultural fields.	Very low. No suitable habitat exists on site.	Very low. No suitable habitat exists on site.	Moderate in willow riparian areas along the river; may forage over adjacent fields. Reported to CNDDB approximately 2.5 miles west of the site.
Bendire's thrasher (*Toxostoma bendirei*)	Federal –BCC State – SSC BLM – sensitive	Arid to semi-arid brushy habitats, usually with yuccas, cholla, and trees	Unlikely/Not observed	Low. Habitat on site is not very suitable.	Low. Habitat on site is not very suitable.
Crissal thrasher (*Toxostoma crissale*)	Federal – None State – SSC BLM – None	Mesquite brushland and densely vegetated washes.	Highly unlikely due to lack of habitat/Not observed	Very low. Suitable habitat does not exist on site.	Very low. Suitable habitat does not exist on site.
Le Conte's thrasher (*Toxostoma lecontei*)	Federal – None State – SSC BLM – None	Desert flats with sparse bushes; preferred nest sites are in large shrubs along washes.	Moderate. Some suitable habitat occurs on site.	Moderate. Some suitable habitat occurs on site.	Low. Little suitable habitat occurs on site.

Species	Sensitivity Status	Habitat	Potential to Occur / Status on Site		
			Proposed Project Site[1]	Reduced Acreage Alternative	Gabrych Alternative
MAMMALS					
Pallid bat (Antrozous pallidus)	Federal – None State – SSC BLM – Sensitive	This gregarious species usually roosts in small colonies in rock crevices and buildings, but may nest in caves, mines, rock piles, and tree cavities. It prefers narrow crevices in caves as hibernation sites. Prey includes flightless arthropods and may include lizards and rodents (Claire et al. 1989).	Possible/Not observed	Moderate for foraging. No roosting potential.	Moderate for foraging. No roosting potential.
Townsend's big-eared bat (*Corynorhinus townsendii*)	Federal – None State – SSC BLM – Sensitive	Broad habitat associations. Roosts in caves and manmade structures; feeds in trees	Possible/Not observed	Moderate for foraging. No roosting potential.	Moderate for foraging. No roosting potential.
Wild burro (*Equus asinus*)	Federal – protected State – None BLM – None	Found in alkali desert scrub, desert scrub, desert succulent shrub, desert riparian, desert wash, Joshua tree, pinyon-juniper, montane chaparral, and pasture. Feed on grasses and forbs. During summer, spend much time in riparian habitats and desert washes. In fall and winter, disperse to open shrub habitats on sloping and rolling terrain. They avoid rocky habitats and steep slopes.	Unlikely/Not observed	High. Scat observed on lands to west.	Very low. Suitable habitat does not occur on site.
Spotted bat (*Euderma maculatum*)	Federal – None State – SSC BLM – Sensitive	Arid scrub and grasslands, to coniferous forests, roosts in cliffs. Forages along waterways.	Unlikely/Not observed	Very low potential for foraging and no potential for roosting.	Moderate potential for foraging along the river.
Western mastiff bat (*Eumops perotis californicus*)	Federal – None State – SSC BLM – Sensitive	Cliffs, trees, tunnels, buildings in desert scrub	Possible/Not observed	Moderate potential for foraging; very low potential for roosting.	Moderate potential for foraging; low potential for roosting.
Yuma puma (*Felis concolor) brownii*)	Federal – None State – None BLM – Sensitive	Yuma pumas live in the southern Colorado Desert from Joshua Tree National Park south and west to the lower Colorado River	Possible/Not observed	Moderate. Suitable foraging habitat exists on site.	Very low. No suitable habitat on site.

Species	Sensitivity Status	Habitat	Potential to Occur / Status on Site		
			Proposed Project Site[1]	Reduced Acreage Alternative	Gabrych Alternative
California leaf-nosed bat *(Macrotus californicus)*	Federal – None State – SSC BLM – Sensitive	Caves, mines, and rock shelters, mostly in Sonoran desert scrub. Roost sites are usually located near foraging areas. These bats do not migrate or hibernate. They feed upon a wide variety of insects, including caterpillars, and supplement their diets with cactus fruit.	Unlikely/Not observed	Low to moderate potential for foraging; very low potential for roosting.	Very low. No suitable habitat on site.
Arizona myotis (*Myotis occultus*)	Federal – None State – SSC BLM – None	Lowlands of the Colorado River and adjacent mountain ranges, up to ponderosa pine habitat; mines, buildings, bridges, riparian woodlands, often near water	Unlikely/Not observed	Low potential for foraging; very low potential for roosting.	Moderate potential for foraging along the river.
Southwestern cave myotis (*Myotis velifer brevis)*	Federal – None State – SSC BLM – Sensitive	Prefers a cave habitat, but will choose other roosting areas if a suitable cave is not available. These alternate areas can include mines, rock crevices, abandoned buildings, barns and under bridges. They feed upon a wide variety of insects are sensitive to human activity and will abandon a roosting area if disturbed.	Unlikely/Not observed	Very low potential for foraging or roosting. Habitat on site is not suitable.	Moderate potential for foraging; low potential for roosting.
Yuma myotis (*Myotis yumanensis ymanensis*)	Federal – None State – None BLM – Sensitive	Several habitat associations, but typically near open water; often roosts in manmade structures	Unlikely/Not observed	Very low potential for foraging or roosting. Habitat on site is not suitable.	Moderate potential for foraging; Low to moderate potential for roosting.
Colorado Valley woodrat (*Neotoma albigula venusta*)	Federal – None State – None BLM – None	Under mesquite in creosote bush scrub; southeastern California	Unlikely due to lack of habitat/Not observed	Low. Suitable habitat does not exist on site.	Low. Suitable habitat does not exist on site.
Big free-tailed bat (*Nyctinomops femorosaccus*)	Federal – None State – SSC BLM – None	Variety of arid areas in pinyon-juniper woodland, desert scrubs, palm oases, drainages, rocky areas	Unlikely/Not observed	Low potential for foraging.	Very low. Suitable habitat does not occur on site.
Pocketed free-tailed bat (*Nyctinomops macrotis*)	Federal – None State – SSC BLM – None	Habitats used include pinyon-juniper woodlands, desert scrub, desert succulent shrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, and palm oasis. Prefers rock crevices in cliffs as roosting sites.	Low to moderate potential for foraging; no suitable roosting areas on site.	Low to moderate potential for foraging; no suitable roosting areas on site.	Low to moderate potential for foraging; no suitable roosting areas on site.

Species	Sensitivity Status	Habitat	Potential to Occur / Status on Site		
			Proposed Project Site[1]	Reduced Acreage Alternative	Gabrych Alternative
Burro deer (*Odocoileus hemionus eremicus*)	Federal – None State – Game species BLM – None	Browse various riparian and microphyllous woodland trees and shrubs.	Possible	Low to moderate. Tracks observed approximately 6 miles southeast of the site.	Low to moderate potential to occur along the river.
Desert bighorn sheep (*Ovis canadensis nelsoni*)	Federal – Endangered State – Threatened BLM – Sensitive	Mountain slopes with sparse growth of trees above the desert floor in California. The species prefers open areas that are steep and rocky to avoid predators (Bleich et al. 1990). Threats to this species include the loss of adequate amounts of desert floor habitat to allow sheep to move between mountains and contact with domestic sheep. Lambs are especially susceptible to pneumonia and other diseases of domestic sheep (DeForge and Scott 1982). Competition with cattle and feral burrows for water resources is another threat to bighorn sheep (Dunn and Douglas 1982).	Possible in Palen and McCoy Mountains/Not observed	Very low. Suitable habitat does not exist on site.	Very low. Suitable habitat does not exist on site.
American badger (*Taxidea taxus)*	Federal – None State – SSC BLM – None	Inhabits coastal sage scrub, mixed chaparral, grassland, oak woodland, chamise chaparral, mixed conifer, pinyon-juniper, desert scrub, desert wash, montane meadow, open areas, and sandy soils.	Observed (burrow only)	High. Suitable foraging habitat/prey exists on site	Low. Limited suitable habitat occurs on site and is isolated from other native habitat areas.
Desert kit fox[2] *(Vulpes macrotis arsipus)*	Federal – None State – Calif. Code of Regulation: PFM BLM – None	Suitable habitat for this fossorial mammal consists of arid open areas, shrub grassland, and desert ecosystems.	Numerous burrow complexes observed.	Present. Numerous burrow complexes observed.	Low to moderate potential to occur in the southwestern corner.

Notes:
1 - Except where noted, data taken from Tetra Tech Biological Resources Technical (BTR) Report for the Project Site (2009a) or associated Data Requests Responses.
2 - Species not covered in Tetra Tech BTR report/Data Requests Responses
m = meters
BLM = Bureau of Land Management
CNPS = California Native Plant Society
SSC = California Species of Special Concern
BCC = USFWS Bird of Conservation Concern
PFM = Protected Fur-bearing Mammal

Alternatives Appendix B

California Agricultural Land Evaluation and Site Assessment (LESA) Model for the Gabrych Alternative

(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.

Final LESA Score Sheet

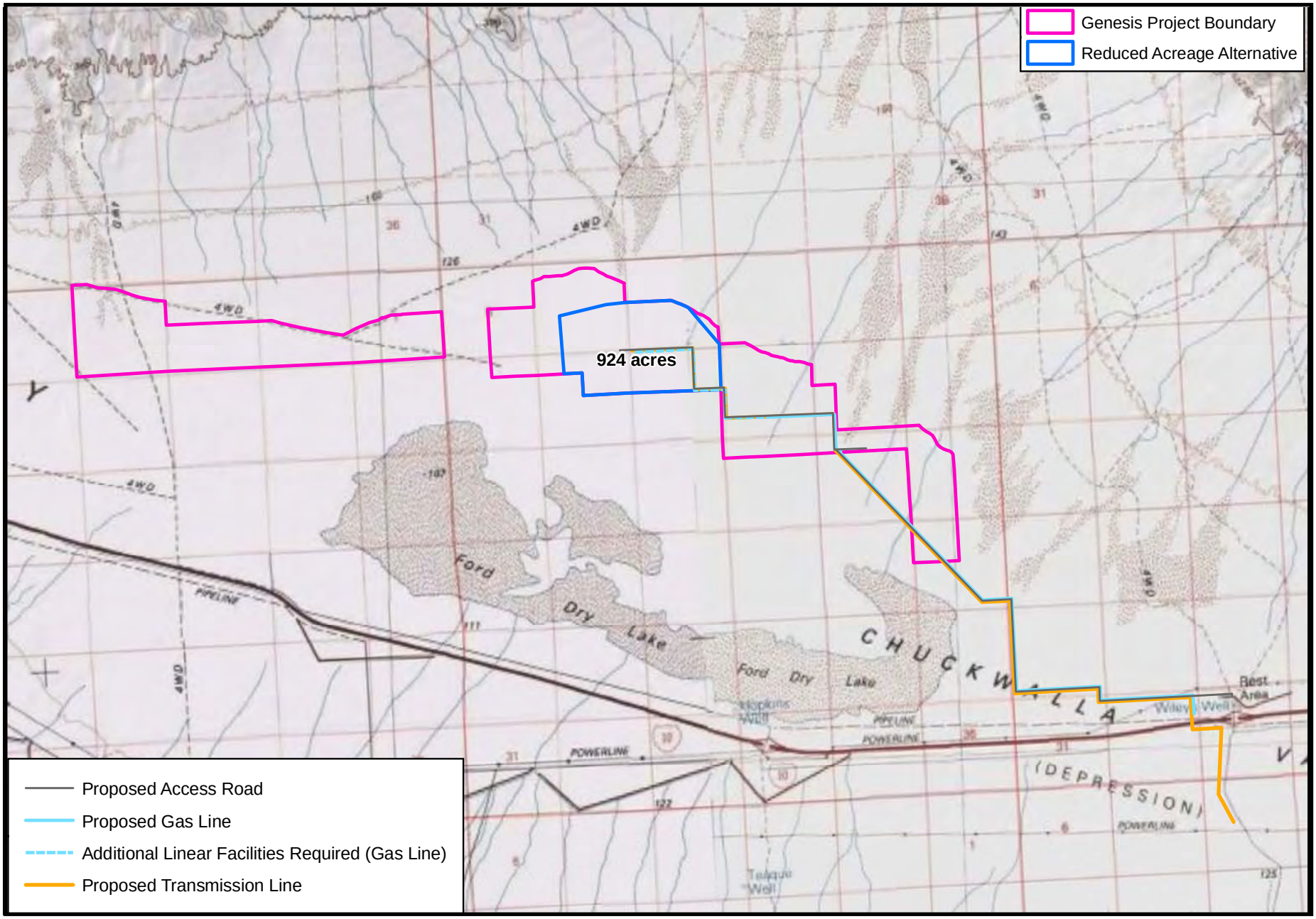
Calculation of the Final LESA Score

		Factor Scores	Factor Weight	Weighted Factor Scores
LE Factors				
Land Capability Classification (see page A-2)	<1>	70.7	0.25	17.675
Storie Index Rating (see page A-2)	<2>	52.03	0.25	13.0075
LE Subtotal			0.50	30.6825
SA Factors				
Project Size (see page A-2)	<3>	100	0.15	15
Water Resource Availability (see page A-5)	<4>	95	0.15	14.25
Surrounding Agricultural Land (see page A-9)	<5>	85	0.15	12.75
Surrounding Protected Resource Land (see page A-9)	<6>	10	0.05	0.5
SA Subtotal			0.50	42.5
			Final LESA Score	73.1825

ALTERNATIVES - FIGURE 1

Genesis Solar Energy Project - Reduced Acreage Alternative

MARCH 2010



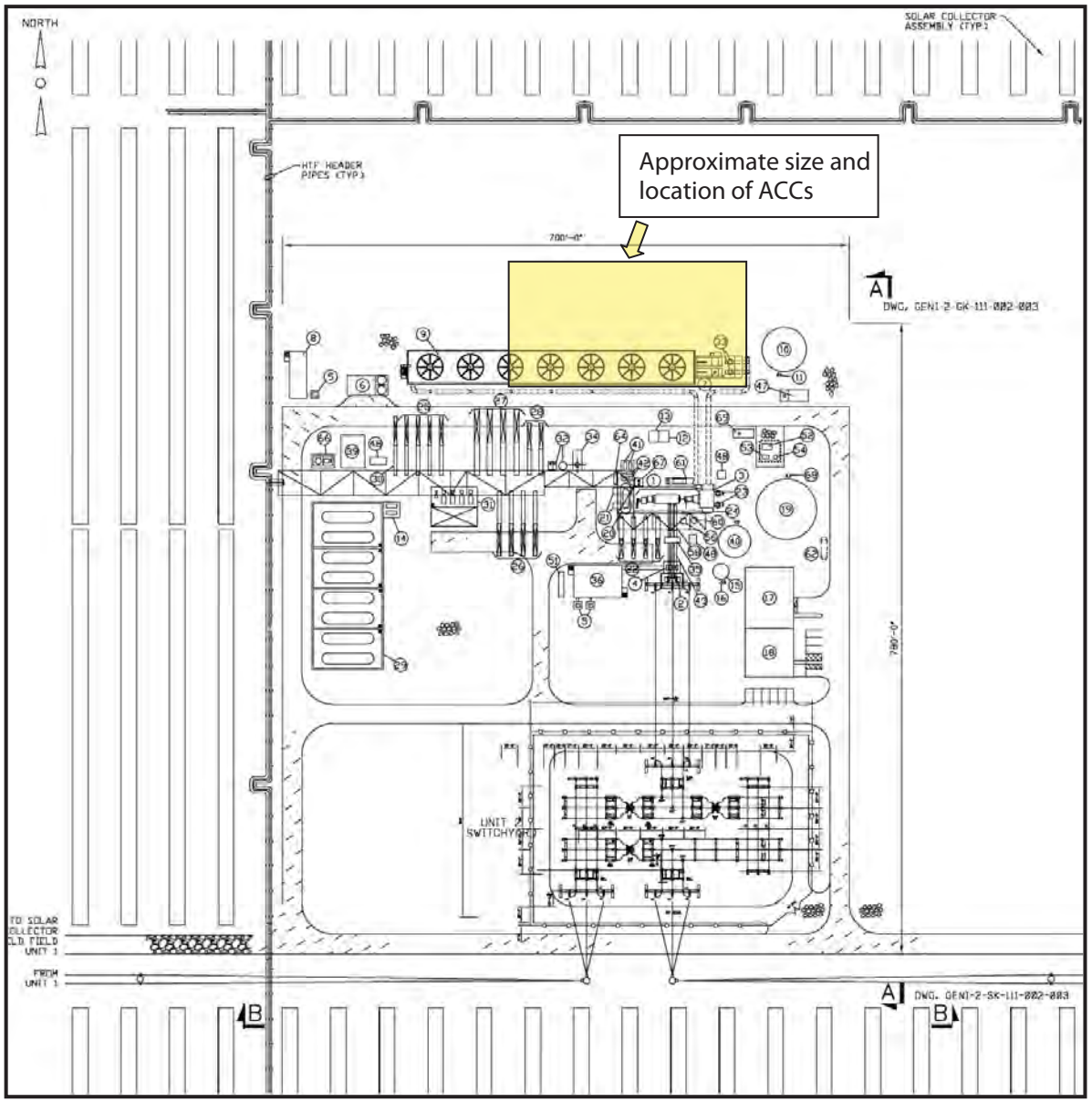
ALTERNATIVES

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010

SOURCE: GSEP 2009a

ALTERNATIVES - FIGURE 2

Genesis Solar Energy Project - Dry Cooling Alternative



Shaded box indicates location of Air Cooled Condenser for one of the two Genesis power blocks.

EQUIPMENT DESCRIPTIONS

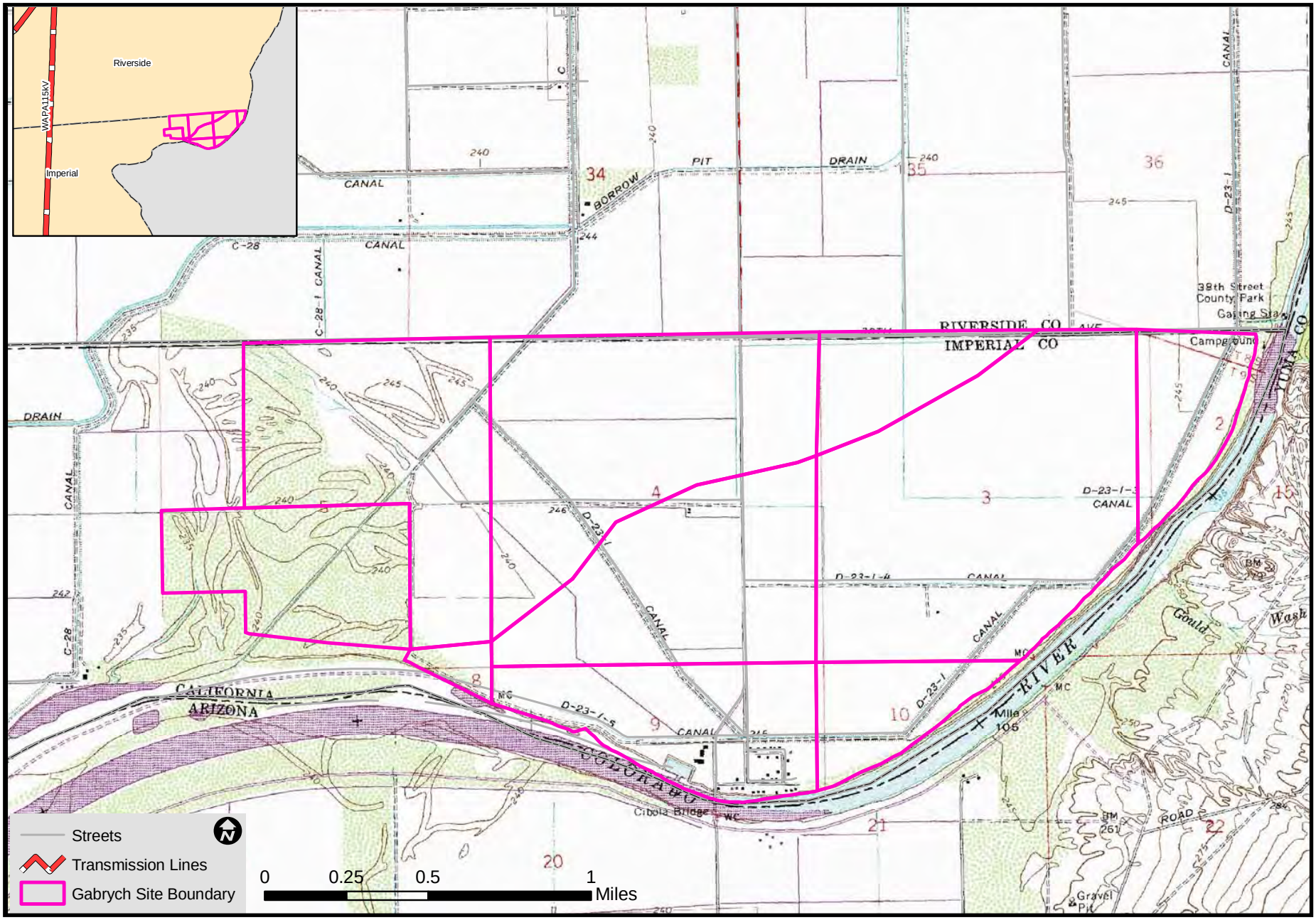
1 STEAM TURBINE/GENERATOR
2 GSU TRANSFORMER
3 SURFACE CONDENSER
4 UNIT AUXILIARY TRANSFORMER
5 STATION SERVICE TRANSFORMERS
6 COOLING TOWER CHEMICAL FEED/STORAGE AREA
7 AUXILIARY COOLING PUMP (BACK-UP/START-UP)
8 COOLING TOWER ELECTRICAL ENCLOSURE
9 COOLING TOWER
10 RAW, FIRE, TANK (500,000 GAL)
11 SERVICE WATER PUMPS
12 CO2 BOTTLE STORAGE
13 H2 BOTTLE STORAGE
14 OVERFLOW TANK PUMPS
15 DEMIN WATER STORAGE TANK (40,000 GAL)
16 DEMIN WATER PUMP SKID
17 WATER TREATMENT AREA (CYCLE CHEM FEED, DEMIN TRAIN, MMF, RO, SAMPLE PANEL, LAB, AIR COMP)
18 CONTROL ROOM/WAREHOUSE BUILDING
19 TREATED WATER TANK (1,250,000 GAL)
20 DEAERATOR/STORAGE TANK/FEEDWATER HEATER
21 FEEDWATER PUMPS
22 FEEDWATER HEATERS
23 CONDENSATE PUMPS
24 GLAND STEAM CONDENSER
25 ECONOMIZERS
26 REHEATERS
27 EVAPORATORS
28 SUPERHEATERS
29 EXPANSION TANKS AND CONTAINMENT AREA
30 HTF FREEZE PROTECTION AND WARNUP HEATER (GAS-FIRED)
31 HTF CIRCULATING PUMPS AND CONTAINMENT AREA
32 BLOWDOWN TANK AND SUMP/PUMPS
33 CIRCULATING WATER PUMPS
34 AUXILIARY BOILER
35 GENERATOR CIRCUIT BREAKER
36 MAIN ELECTRICAL ENCLOSURE
37 NOT USED
38 NOT USED
39 ULLAGE SYSTEM AND CONTAINMENT AREA
40 WASTE WATER TANK (250,000 GAL)
41 CLOSED COOLING WATER HEAT EXCHANGERS
42 CLOSED COOLING WATER PUMPS
43 ISOLATED PHASE BUS DUCT
44 NOT USED
45 NOT USED
46 NOT USED
47 FIRE PUMP HOUSE
48 FIRE PROTECTION SPRINKLER HOUSE
49 NOT USED
50 NOT USED
51 10s-START DIESEL GENERATOR
52 ABOVE GROUND DIESEL FUEL STORAGE TANK (3,000 GAL)
53 DIESEL FUEL PUMP
54 WASH TRUCK DEMIN FILL STATION
55 NOT USED
56 STEAM JET AIR INJECTOR
57 NOT USED
58 EXCITATION TRANSFORMER
59 NOT USED
60 TURBINE AREA FLASH TANK
61 LUBE OIL AND EHC SKID
62 OIL/WATER SEPARATOR
63 NOT USED
64 CLOSED COOLING WATER EXPANSION TANK
65 NOT USED
66 NITROGEN BULK STORAGE AND VAPORIZER
67 EQUIPMENT DRAINS SUMP AND PUMPS
68 TREATED WATER PUMP SKID
69 EMERGENCY DIESEL GENERATOR

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010

SOURCE: GSEP 2009a, Figure 3.4-3

ALTERNATIVES - FIGURE 3

Genesis Solar Energy Project - Gabrych Alternative

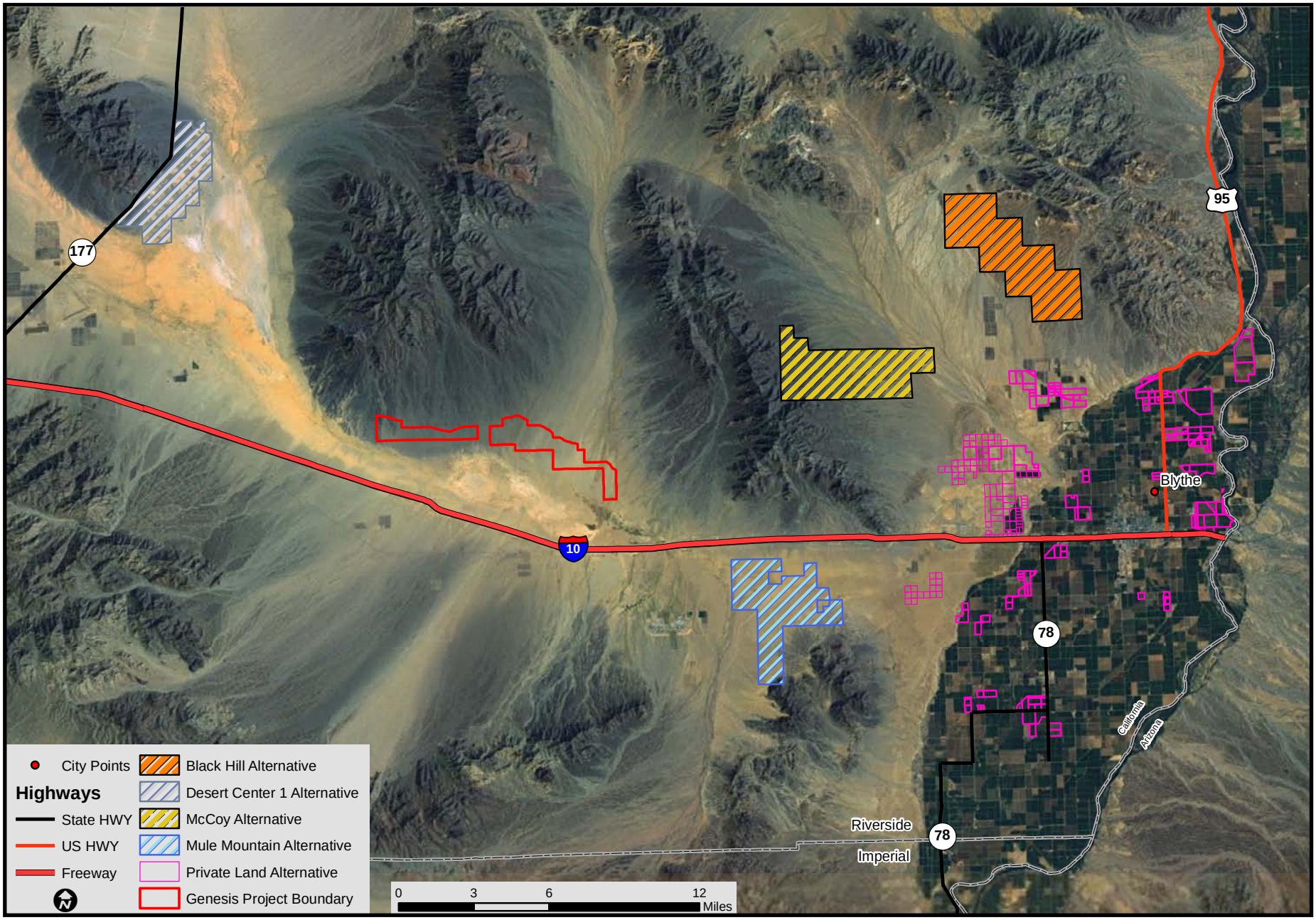


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010

SOURCE: GSEP 2009f

ALTERNATIVES - FIGURE 4

Genesis Solar Energy Project - Alternatives Considered But Not Evaluated in Further Detail



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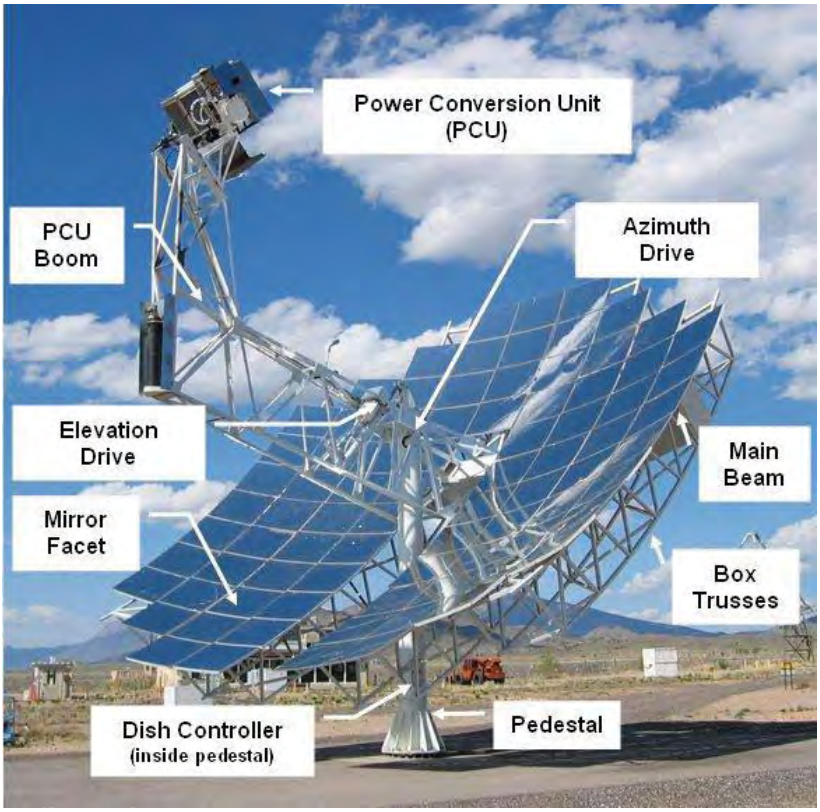
SOURCE: GSEP 2009f

ALTERNATIVES - FIGURE 5

Genesis Solar Energy Project - Solar Generation Technologies



Stirling dish (from Stirling Energy Systems website)

Solar Power Tower (from ISEGS PSA, 2008)

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SOURCE: Stirling Energy Systems website and ISEGS PSA, 2008

ALTERNATIVES - FIGURE 6
Genesis Solar Energy Project - 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

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010
SOURCE: As listed

B.3 - Cumulative Scenario

Testimony of 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 large number of renewable projects have been proposed on BLM managed land, State land, and private land in California. As of January 2010, there were 244 renewable projects proposed in California in various stages of the environmental review process or under construction. As of December 2009, *49* of these projects, representing approximately 10,500 MW, were planning on requesting American Recovery and Reinvestment Act funds from the Federal government. Solar, wind, and geothermal development applications have requested use of BLM land, including approximately one million acres of the California desert. State and private lands have also been targeted for renewable solar and wind projects.

Cumulative Figures 1 and **Cumulative Tables 1A and 1B** illustrate the numerous proposed renewable projects on BLM, State and private land in California. In addition, nearly 80 applications for solar and wind projects are being considered on BLM land in Nevada and Arizona.

Likelihood of Development. The large 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 state-required Renewable Portfolio Standards. Not all of the projects listed in **Tables 1A** and **1B** will complete the environmental review, and not all projects will be funded and constructed. 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.

Incentives for Renewable Development. 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 THE CUMULATIVE PROJECT SCENARIO

Cumulative impacts analysis is intended to highlight past actions that are closely related either in time or location to the project being considered, catalogue past projects and discuss how they have harmed the environment, and discuss past actions even if they

were undertaken by another agency or another person. Most of the projects listed in the cumulative projects tables (**Cumulative Tables 1A and 1B, 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.

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 Staff Assessment/Draft Environmental Impact Statement (SA/DEIS) uses the "list approach" for purposes of state law to provide a tangible understanding and context for analyzing the potential cumulative effects of a Project.

Under NEPA, an EIS must provide a sufficiently detailed catalogue of past, present, and reasonably foreseeable future projects, and provide an adequate analysis of how these projects, in conjunction with the proposed action, are thought to have impacted or are expected to impact the environment. While NEPA requires an adequate cataloging of past projects, it also requires a discussion of consequences of those past projects. NEPA is designed to inform decision making and through disclosure of relevant environmental considerations, permit informed public comment.

In order to provide a basis for cumulative analysis for each discipline, this section provides information on other projects in both maps and tables. The Energy Commission and the BLM have identified the California desert as the largest area within which cumulative effects should be assessed for all disciplines, as shown in two maps and accompanying tables. However, within the desert region, the specific area of cumulative effect varies by resource. For this reason, each discipline has identified the geographic scope for the discipline's analysis of cumulative impacts. **Cumulative Figures 1 and 2** are on the following pages, and **Cumulative Tables 1, 2, and 3** are presented at the end of this section.

Cumulative Impacts Figure 2 (I-10 Corridor Existing and Future/Foreseeable Projects) and **Tables 2 and 3** define the projects in the immediate vicinity of the I-10 corridor. The area included on these tables consists of an approximate 15 to 20-mile radius around the project site. Table 2 presents existing projects and Table 3 presents future foreseeable projects. Both tables indicate project name, type, location, and status. This data is presented for consideration within each discipline.

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 Genesis Solar Energy Project could combine with those of other projects.

2. Evaluate the effects of the Genesis Solar Energy Project in combination with past and present (existing) projects within the area of geographic effect defined for each discipline.

3. Evaluate the effects of the Genesis Solar Energy 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 Genesis Solar Energy 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 Genesis Solar Energy Project's schedule. This is a consideration for short-term impacts from the Genesis Solar Energy 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 Genesis Solar Energy Project.

PROJECT EFFECTS IN COMBINATION WITH FORESEEABLE FUTURE PROJECTS

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).

Each discipline evaluates the impacts of the proposed project on top of the current baseline; the past, present (existing) and reasonably foreseeable or probable future

projects in each I-10 corridor project vicinity as illustrated in **Cumulative Impacts – Figure 2 (I-10 Corridor Existing and Future/Foreseeable Projects)** and **Cumulative Impacts Tables 2 (existing projects) and 3 (future/foreseeable projects)**.

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 I-10 corridor area as well as other large renewable projects in the California, Nevada, and Arizona desert regions. These projects are illustrated in **Cumulative Impacts Figures 1 and 2**. As shown in the map and table, there are a number of projects in the immediate area around the I-10 corridor whose impacts could combine with those of the proposed project. As shown on **Cumulative Impacts Figure 1** and in **Table 1**, solar and wind development applications for use of BLM land have been submitted for approximately one million acres of the California Desert Conservation Area. Additional BLM land in Nevada and Arizona also has applications for solar and wind projects.

Table 1A. Renewable Energy Projects in the California Desert District

BLM Field Office	Number of Projects & Acres	Total MW
Solar Energy		
Barstow Field Office	• 18 projects • 132,560 acres	• 12,875 MW
El Centro Field Office	• 7 projects • 50,707 acres	• 3,950 MW
Needles Field Office	• 17 projects • 230,480 acres	• 15,700 MW
Palm Springs Field Office	• 17 projects • 123,592 acres	• 11,873 MW
Ridgecrest Field Office	• 4 projects • 30,543 acres	• 2,835 MW
TOTAL – CA Desert District	• **63 projects** • **567,882 acres**	• **47,233 MW**
Wind Energy		
Barstow Field Office	• 25 projects • 171,560 acres	• n/a
El Centro Field Office	• 9 projects (acreage not given for 3 of the projects) • 48,001 acres	• n/a
Needles Field Office	• 8 projects • 115,233 acres	• n/a
Palm Springs Field Office	• 4 projects • 5,851 acres	• n/a
Ridgecrest Field Office	• 16 projects • 123,379 acres	• n/a
TOTAL – CA Desert District	• **62 projects** • **433,721 acres**	• n/a

Source: Renewable Energy Projects in the California Desert Conservation Area identifies solar and wind renewable projects as listed on the BLM California Desert District Alternative Energy Website (BLM 2009)

Table 1B. Renewable Energy Projects on State and Private Lands*

Project Name	Location	Status
Solar Projects		
Solargen Panoche Valley Solar Farm (400 MW Solar PV)	San Benito County	EIR in progress
Maricopa Sun Solar Complex (350 MW Solar PV)	Kern County	Information not available
Panoche Ranch Solar Farm (250 MW Solar PV)	Kern County	Information not available
Gray Butte Solar PV (150 MW Solar PV)	Los Angeles County	Information not available
Monte Vista (126 MW Solar PV)	Kern County	Information not available
San Joaquin Solar 1 and 2 (107 MW Solar hybrid)	Fresno	Under environmental review
NRG Alpine Suntower (40 MW solar PV and 46 MW solar thermal)	Los Angeles	Information not available
Palmdale Hybrid Power Project Unit 1 (50 MW solar thermal, part of a hybrid project)	City of Palmdale	Under environmental review
Lucerne Valley Solar (50 MW solar PV)	San Bernardino	Under environmental review
Lost Hills (32.5 solar PV)	Kern County	Information not available
Tehachapi Photovoltaic Project (20 MW solar PV)	Kern County	Information not available
Sun City Project Phase 1 (20 MW solar PV)	Kings County	Information not available
Boulevard Associates (20 MW solar PV)	San Bernardino County	Information not available
Stanislaus Solar Project I (20 MW solar PV)	Stanislaus County	Information not available
Stanislaus Solar Project II (20 MW solar PV)	Stanislaus County	Information not available
Synapse Solar 2 (20 MW solar PV/solar thermal)	Kings	Information not available
T, squared, Inc. (19 MW solar PV)	Kern County	Information not available
Rancho Seco Solar Thermal (15-17 MW solar trough)	Sacramento County	Information not available
Global Real Estate Investment Partners, LLC (solar PV)	Kern County	Information not available
Recurrent Energy (solar PV)	Kern County	Information not available
Man-Wei Solar (solar PV)	Kern County	Information not available
Regenesis Power for Kern County Airports Dept.	Kern County	Information not available
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

Project Name	Location	Status
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 Projects		
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
City of Vernon Wind Energy Project (300 MW)	City of Vernon	Information not available
Manzana Wind Project (246 MW)	Kern County	Information not available
Iberdrola Tule Wind (200 MW)	San Diego County, McCain Valley	EIR/EIS in progress
Padoma Wind Energy (175 MW)	Shasta County	Information not available
Pine Canyon (150 MW)	Kern County	Information not available
Shiloh III (200 MW)	Montezuma Hills, Solano County	Information not available
AES Daggett Ridge (84 MW)	San Bernardino	EIS in progress
Granite Wind, LLC (81 MW)	San Bernardino	EIR/EIS in progress
Bear River Ridge (70 MW)	Humboldt County	Information not available
Aero Tehachapi (65 MW)	Kern County	Information not available
Montezuma Wind II (52-60)	Montezuma Hills, Solano County	Information not available
Tres Vaqueros (42 MW wind repower)	Contra Costa County	Information not available
Montezuma Hills Wind Project (34-37 MW)	Solano County	Information not available
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 Projects		
Buckeye Development Project	Geyserville, Sonoma	Under environmental review
Orni 18, LLC Geothermal Power Plant (49.9 MW)	Brawley, Imperial County	Information not available

Project Name	Location	Status
Black Rock Geothermal 1,2,and 3	Imperial County	Information not available

* This list is compiled from the projects on CEQAnet as of November 2009 and the projects located on private or State lands that are listed on the Energy Commission Renewable Action Team website as requesting ARRA funding. Additional renewable projects proposed on private and State lands but not requesting ARRA funds are listed on the website.

Source: CEQAnet [http://www.ceqanet.ca.gov/ProjectList.asp], November 2009 and CEC Renewable Action Team – Generation Tracking for ARRA Projects 12/29/2009 [http://www.energy.ca.gov/33by2020/documents/2009-12-29/2009-12-29_Proposed_ARRA_Renewable_Projects.pdf]

Table 2. Existing Projects along the I-10 Corridor (Eastern Riverside County)						
ID #	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
1	Interstate 10	Linear project running from Santa Monica to Blythe (in California)	Caltrans	Existing	N/A	Interstate 10 (I-10) is a major east-west route for trucks delivering goods to and from California. It is a four lane divided highway in the Blythe region.
2	Chuckwalla Valley State Prison	19025 Wiley's Well Rd. Blythe, CA	CA Dept. of Corrections & Rehabilitation	Existing	1,080	State prison providing long-term housing and services for male felons classified as medium and low-medium custody inmates jointly located on 1,720 acres of State-owned property. APN 879040006,008, 012, 027, 028, 029, 030,
3	Ironwood State Prison	19005 Wiley's Well Rd. Blythe, CA	CA Dept. of Corrections & Rehabilitation	Existing	640	ISP jointly occupies with Chuckwalla Valley State Prison 1,720 acres of State-owned property, of which ISP encompasses 640 acres. The prison complex occupies approximately 350 acres with the remaining acreage used for erosion control, drainage ditches, and catch basins. 879040001, 004, 009, 010, 011, 015, 016, 017, 018, 019, 020
4	Devers-Palo Verde Transmission Line	From the Midpoint Substation to Devers Substation	SCE	Existing	N/A	Existing 500 kV transmission line parallel to I-10 from Midpoint Substation, approximately 10 miles southwest of Blythe, to the SCE Devers Substation, near Palm Springs.
5	Blythe Energy Project	City of Blythe, north of I-10, 7 miles west of the CA/AZ border	Blythe Energy, LLC	Existing	76	520 MW combined-cycle natural gas-fired electric-generating facility. Project is connected to the Buck Substation owned by WAPA.
6	West-wide Section 368 Energy Corridors	Riverside County, parallel to DPV corridor	BLM, DOE, U.S. Forest Service	Approved by BLM and U.S. Forest Service	N/A	Designation of corridors on federal land in the 11 western states, including California, for oil, gas, and hydrogen pipelines and electricity transmission and distribution facilities (energy corridors). One of the corridors runs along the southern portion of Riverside County.
7	Eagle Mountain Pumping Plant	Eagle Mountain Road, west of Desert Center	Metropolitan Water District of Southern California	Existing		144 ft. pumping plant that is part of the Metropolitan Water District of Southern California's facilities. APNs 807150007, 807150009, 807150010
8	Recreational Opportunities	Eastern Riverside County	BLM	Existing	N/A	BLM has numerous recreational opportunities on lands in eastern Riverside County along the I-10 corridor including the Wiley's Well Campground, Coon Hollow Campground, and Midland Long-Term Visitor Area.
9	Kaiser Mine	Eagle Mountain, north of Desert Center	Kaiser Ventures, Inc.	Mining activities stopped in 1983.		Kaiser Steel mined iron ore at Kaiser Mine in Eagle Mountain and provided much of the Pacific Coast steel in the 1950s. Mining project also included the Eagle Mountain Railroad, 51 miles long. Imported steel captured market share in the 1960s and 1970s and primary steelmaking closed in the 1980s. 701380031

Table 3. Future Foreseeable Projects along the I-10 Corridor (Eastern Riverside County)						
ID #	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
A	Four Commercial Projects	Blythe, CA	Various	Approved	N/A	Four commercial projects have been approved by the Blythe Planning Department including the Agate Road Boat & RV Storage, Riverway Ranch Specific Plan, Subway Restaurant and Motel, and Agate Senior Housing Development.
B	Intake Shell	Blythe, CA		Under Construction	N/A	Reconstruction of a Shell facility located at Intake & Hobsonway. Demolition occurred in 2008, reconstruction planned for 2009-2010.
C	Fifteen Residential Developments	Blythe, CA	Various	Approved/Under Construction	N/A	Twelve residential development projects have been approved by the Blythe Planning Department including: Vista Palo Verde (83 Single Family Residential [SFR]), Van Weelden (184 SFR), Sonora South (43 SFR), Ranchette Estates (20 SFR), Irvine Assets (107 SFR), Chanslor Village (79 SFR), St. Joseph's Investments (69 SFR), Edgewater Lane (SFR), The Chanslor Place Phase IV (57 SFR), Cottonwood Meadows (103 Attached SFR), Palo Verde Oasis Phase IV (29 SFR). Three residential development projects have been approved and are under construction including: The Chanslor Phase II & III (78 SFR), River Estate at Hidden Beaches, Mesa Bluffs Villas (26 Attached SFR).
D	Devers-Palo Verde 2 Transmission Line Project	From the Midpoint Substation to Devers Substation	SCE	Project was approved by CPUC 11/2009.	N/A	New 500 kV transmission line parallel to the existing Devers-Palo Verde Transmission Line from Midpoint Substation, approximately 10 miles southwest of Blythe, to the SCE Devers Substation, near Palm Springs. The ROW for the 500 kV transmission line would be adjacent to the existing DPV ROW and would require an additional 130 feet of ROW on federal and State land and at least 130 feet of ROW on private land and Indian Reservation land.
E	Colorado Substation	10 miles southwest of Barstow	SCE	Project was approved by CPUC 11/2009.	44	The new 500/230 kV substation would be constructed within a rectangular area approximately 1,000 feet by 1,900 feet, resulting in approximately 44 acres permanently disturbed. The 500 kV switching station would include buses, circuit breakers, and disconnect switches. The switchyard would be equipped with 108-foot-high dead-end structures. Outdoor night lighting would be designed to illuminate the switchrack when manually switched on.
F	Blythe Energy Project Transmission Line	From the Blythe Energy Project (Blythe, CA) to Devers Substation	Blythe Energy, LLC	Under construction	N/A	Transmission Line Modifications including upgrades to Buck Substation, approximately 67.4 miles of new 230 kV transmission line between Buck Substation and Julian Hinds Substation, upgrades to the Julian Hinds Substation, installation of 6.7 miles of new 230 kV transmission line between Buck Substation and SCE's DPV 500 kV transmission line.

Table 3. Future Foreseeable Projects along the I-10 Corridor (Eastern Riverside County)						
ID #	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
G	Desert Southwest Transmission Line	118 miles primarily parallel to DPV	Imperial Irrigation District	Final EIR prepared 2005. Approved by the BLM in 2006.	N/A	New, approximately 118-mile 500 kV transmission line from a new substation/switching station near the Blythe Energy Project to the existing Devers Substation located approximately 10 miles north of Palm Springs, California.
H	Green Energy Express Transmission Line Project	70-mile transmission line from the Eagle Mountain Substation to southern California	Green Energy Express LLC	September 9, 2009, Green Energy Express LLC filed a Petition for Declaratory Order requesting that FERC approve certain rate incentives for the project	N/A	70-mile double-circuit 500 kV transmission line and new 500/230 kV substation from near the Eagle Mountain Substation (eastern Riverside County) to Southern California
I	Blythe Energy Project II	Blythe, CA. Near the Blythe Airport and I-10	Blythe Energy, LLC	Approved December 2005	30 acres (located on Blythe Energy Project land)	520 MW combined-cycle power plant located entirely within the Blythe Energy Project site boundary. Blythe Energy Project II will interconnect with the Buck Substation constructed by WAPA as part of the Blythe Energy Project. Project is designed on 30 acres of a 76-acre site.
J	Eagle Mountain Pumped Storage Project	Eagle Mountain iron ore mine, north of Desert Center	Eagle Crest Energy Company	License application filed with FERC in June 2009	1,524	1,300 MW pumped storage project designed to store off-peak energy to utilize during on-peak hours. The captured off-peak energy will be used to pump water to an upper reservoir where the energy will be stored. The water will then be released to a lower reservoir through an underground electrical generating facility where the stored energy will be released back into the Southwestern grid during "high demand peak" times, primarily weekdays. Estimated water use is 8,100 AFY for the first four-year start-up period and replacement water is 1,763 AFY thereafter. 1

Table 3. Future Foreseeable Projects along the I-10 Corridor (Eastern Riverside County)						
ID #	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
K	Genesis Solar Energy Project	North of I-10, 10 miles east of Desert Center	Solar Millennium LLC/Chevron Energy	Undergoing environmental review, construction to begin end of 2010 with one unit online in 2012 and one unit online in 2013.	5,200	500 MW solar trough project on 5,200 acres. Facility would consist of two 250 MW plants. Approximately 3,870 acres would be disturbed. Project would include interconnection to the SCE Red Bluff Substation. Project would use 300 AFY.
L	Blythe Solar Power Project	North of I-10, immediately north of the Blythe Airport	Solar Millennium LLC/Chevron Energy	Undergoing environmental review	9,400	1,000 MW solar trough facility on 9,400 acres
M	NextEra (FPL) McCoy	Northwest of Blythe, CA, immediately north of Blythe Solar Power Project	NextEra (FPL)	Plan of Development in to Palm Springs BLM	20,608	250 MW solar trough project. ROW in process for monitoring water well drilling.
N	McCoy Soleil Project	10 miles northwest of Blythe	enXco	Plan of Development in to Palm Springs BLM	1,959	300 MW solar power tower project located on 1,959 acres. Project would require a 14 mile transmission line to proposed SCE Colorado Substation south of I-10. Would use 575-600 AFY.
O	Genesis Solar Energy Project	North of I-10, 25 miles west of Blythe and 27 miles east of Desert Center	NextEra (FPL)	Undergoing environmental review. Construction to begin at the end of 2010.		250 MW solar trough project located on 4,640 acres north of the Ford Dry Lake. Project includes six mile natural gas pipeline and a 5.5 mile gen-tie line to the Blythe Energy Center to Julian Hinds Transmission Line, then travel east on shared transmission poles to the Colorado River Substation.
P	Big Maria Vista Solar Project	North of I-10, approximately 12 miles northwest of Blythe	Bullfrog Green Energy	Plan of Development submitted to BLM	2,684	500 MW solar photovoltaic project on 2,684 acres of land. Project would be built in three phases and would require 6,000 gallons of water monthly.
Q	Chuckwalla Solar I	1 mile north of Desert Center	Chuckwalla Solar I, LLC	Plan of Development submitted to BLM	4,083	200 MW solar photovoltaic project on 4,083 acres of land. Project would be developed in several phases and would tap into an existing SCE 161-kV transmission line crossing the site.
R	Rice Solar Energy Project	Rice Valley, Eastern Riverside County	Rice Solar Energy, LLC (SolarReserve, LLC)	Undergoing environmental review. Construction to begin in 2011	1,410	150 MW solar power tower project with liquid salt storage. Project is located on approximately 1,410 acres and includes a power tower approximately 650 feet tall and a 10-mile long interconnection with the WAPA Parker-Blythe transmission line.

Table 3. Future Foreseeable Projects along the I-10 Corridor (Eastern Riverside County)						
ID #	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
S	Blythe Airport Solar I Project	Blythe Airport	U.S. Solar	Application has been submitted to City of Blythe, City of Blythe approved the project in November, 2009	640	100 MW solar photovoltaic project located on 640 acres of Blythe airport land.
T	Blythe PV Project	Blythe	First Solar	CPUC approved project terms of a 20 year power purchase agreement for sale of 7.5 MW, Under construction in forth quarter, 2009	200	7.5 MW solar photovoltaic project located on 200 acres. Project was constructed by First Solar and sold to NRG Energy.
U	Desert Quartzite	South of I-10, 8 miles southwest of Blythe	First Solar (previously OptiSolar)	POD in to BLM	7,724	600 MW solar photovoltaic project located on 7,724 acres. Adjacent to DPV transmission line and SCE Colorado Substation. Approximately 27 AF would be used during construction and 3.8 AFY during operation.
V	Desert Sunlight	North of Desert Center	First Solar (previously OptiSolar)	POD in to BLM	5,000-6,000	250 MW solar photovoltaic project located on 5,000-6,000 acres. Project would tie into the SCE Red Bluff Substation. Approximately 27 AF would be used during construction and 3.8 AFY during operation.
W	EnXco	North of Wileys Well Road, east of Genesis Solar Energy Project	enXco	POD in to BLM		300 MW solar photovoltaic project location on X acres.
X	Desert Lily Soleil Project	6 miles north of Desert Center	enXco		1,216	100 MW photovoltaic plant on 1,216 acres of BLM land. Would require a 5-8 mile transmission line to planned SCE Red Bluff Substation.
Y	Red Bluff Substation	Unknown at this time – near Desert Center	SCE		N/A	Proposed 230/500 kV Substation near Desert Center. Planned to interconnect renewable projects near Desert Center with the DPV transmission line.
Z	Chuckwalla Valley Raceway	Desert Center Airport (no longer a functioning airport)	Developer Matt Johnson	Under construction, track expected to be open in mid 2010	400	Proposed 500-mile race track located on 400 acres of land that used to belong to Riverside County and was used as the Desert Center airport. APN 811142016, 811142006

Table 3. Future Foreseeable Projects along the I-10 Corridor (Eastern Riverside County)						
ID #	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
AA	Eagle Mountain Landfill Project	Eagle Mountain, North of Desert Center	Mine Reclamation Corporation and Kaiser Eagle Mountain, Inc.	U.S. Court of Appeals for the Ninth Circuit issued its regarding the EIS for the project in 11/09 and ruled that the land exchange for the project was not properly approved by the administrative agency. Kaiser's Mine and Reclamation is considering all available options.	~ 3,500	The project proposed to develop the project on a portion of the Kaiser Eagle Mountain Mine in Riverside County, California. The proposed project comprises a Class III nonhazardous municipal solid waste landfill and the renovation and repopulation of Eagle Mountain Townsite. The proposal by the proponent includes a land exchange and application for rights-of-way with the Bureau of Land Management and a Specific Plan, General Plan Amendment, Change of Zone, Development Agreement, Revised Permit to Reclamation Plan, and Tentative Tract Map with the County.The Eagle Mountain landfill project is proposed to accept up to 20,000 tons of non-hazardous solid waste per day for 50 years.
AB	Wileys Well Communication Tower (part of the Public Safety Enterprise Communication System)	East of Wileys Well Road, just south of I-10	Riverside County	Final EIR for the Public Safety Enterprise Communication System published in August 2008.	N/A	The Public Safety Enterprise Communication project is the expansion of the County of Riverside's fire and law enforcement agencies approximately 20 communication sites to provide voice and data transmission capabilities to assigned personnel in the field.
AC	Mule Mountain Solar Project	South of I-10, approximately 4 miles west of Blythe	Bullfrog Green Energy	Plan of Development in to Palm Springs BLM	2,684	500 MW solar concentrating photovoltaic project located on 2,684 acres. Considering interconnection with proposed SCE Colorado Substation. Approximately 6,000 gallons of water would be required monthly.
Additional Projects Outside Cumulative Figure Boundaries						

Table 3. Future Foreseeable Projects along the I-10 Corridor (Eastern Riverside County)						
ID #	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
	Paradise Valley "New Town" Development	Approximately 30 miles west of Desert Center (7 miles east of the city of Coachella)	Glorious Land Company	Notice of Preparation of an EIR published in December of 2005. Still under environmental review.	6,397	Company proposed to develop a planned community as an international resort destination with residential, recreational, commercial, and institutional uses and facilities. The project is planned as a self-contained community with all public and quasi-public services provided. The project is located outside the Coachella Valley Water District (CVWD) boundaries and the applicant has entered into an agreement with the CVWD to manage artificial recharge of the Shaver's Valley groundwater. The proponent has purchased a firm water supply from Rosedale-Rio Bravo Water District in Kern County. In-kind water will be transferred to the MWD which will release water from the Colorado River Aqueduct to a 38 acre percolation pond on the project site. The MWD will deliver approximately 10,000 AFY to the percolation pond and over the long term, no net loss of groundwater in storage is anticipated.
	Proposed National Monument (former Catellus Lands)	Between Joshua Tree National Park and Mojave National Preserve		In December 2009, Senator Feinstein introduced bill S.2921 that would designate two new national monuments including the Mojave Trails National Monument.	941,000 acres	The proposed Mojave Trails National Monument would protect approximately 941,000 acres of federal land, including approximately 266,000 acres of the former railroad lands along historic Route 66. The BLM would be given the authority to conserve the monument lands and also to maintain existing recreational uses, including hunting, vehicular travel on open roads and trails, camping, horseback riding and rockhounding.
	BLM Renewable Energy Study Areas	Along the I-10 corridor between Desert Center and Blythe	BLM	Proposed		The DOE and BLM identified 24 tracts of land as Solar Energy Study Areas in the BLM and DOE Solar PEIS. These areas have been identified for in-depth study of solar development and may be found appropriate for designation as solar energy zones in the future.
	Solar Energy projects along Arizona Border	Approximately 15 miles east of the CA/ AZ border along I-10 corridor	Various	Applications filed in to Arizona BLM field offices, application status listed as pending.		Five solar trough and solar power tower projects have been proposed along the I-10 corridor approximately 15 miles east of the CA/AZ border. The projects have been proposed on BLM administered-land in the Yuma and Kingman Field Offices and have requested use of approximately 75,000 acres.

1. Water usage for the Eagle Mountain Pumped Storage Project was based on the information provided to FERC by the Eagle Crest Energy Company in the Responses to Deficiency of License Application and Additional Information Request dated October 26, 2009.

REFERENCES

Bureau of Land Management Arizona. Solar Energy. <http://www.blm.gov/az/st/en/prog/energy/solar/sonoran_solar.html> Accessed November 2009.

Bureau of Land Management California. Renewable Energy. <http://www.blm.gov/ca/st/en/prog/energy/solar.html> Accessed November 2009.

California Department of Correction and Rehabilitation. <http://www.cdcr.ca.gov/Visitors/Facilities/ISP.html> Accessed November 2009.

California Energy Commission Power Plant Siting Website < http://www.energy.ca.gov/sitingcases/alphabetical.html> Accessed November 2009.

Chuckwalla Valley Raceway. < http://www.chuckwallavalleyraceway.com/index.php?option=com_content&view=article&id=104:track-highlights&catid=46:race-track-about&Itemid=162> Accessed December 2009.

City of Blythe Planning Department. < http://www.cityofblythe.ca.gov/index.aspx?nid=27> Accessed November 2009.

Devers-Palo Verde 2 Transmission Line Project Final EIR/EIS. < http://www.cpuc.ca.gov/Environment/info/aspen/dpv2/dpv2.htm> Accessed November 2009.

Riverside County Public Safety Enterprise Communication System. < http://psec.co.riverside.ca.us/about.html>.

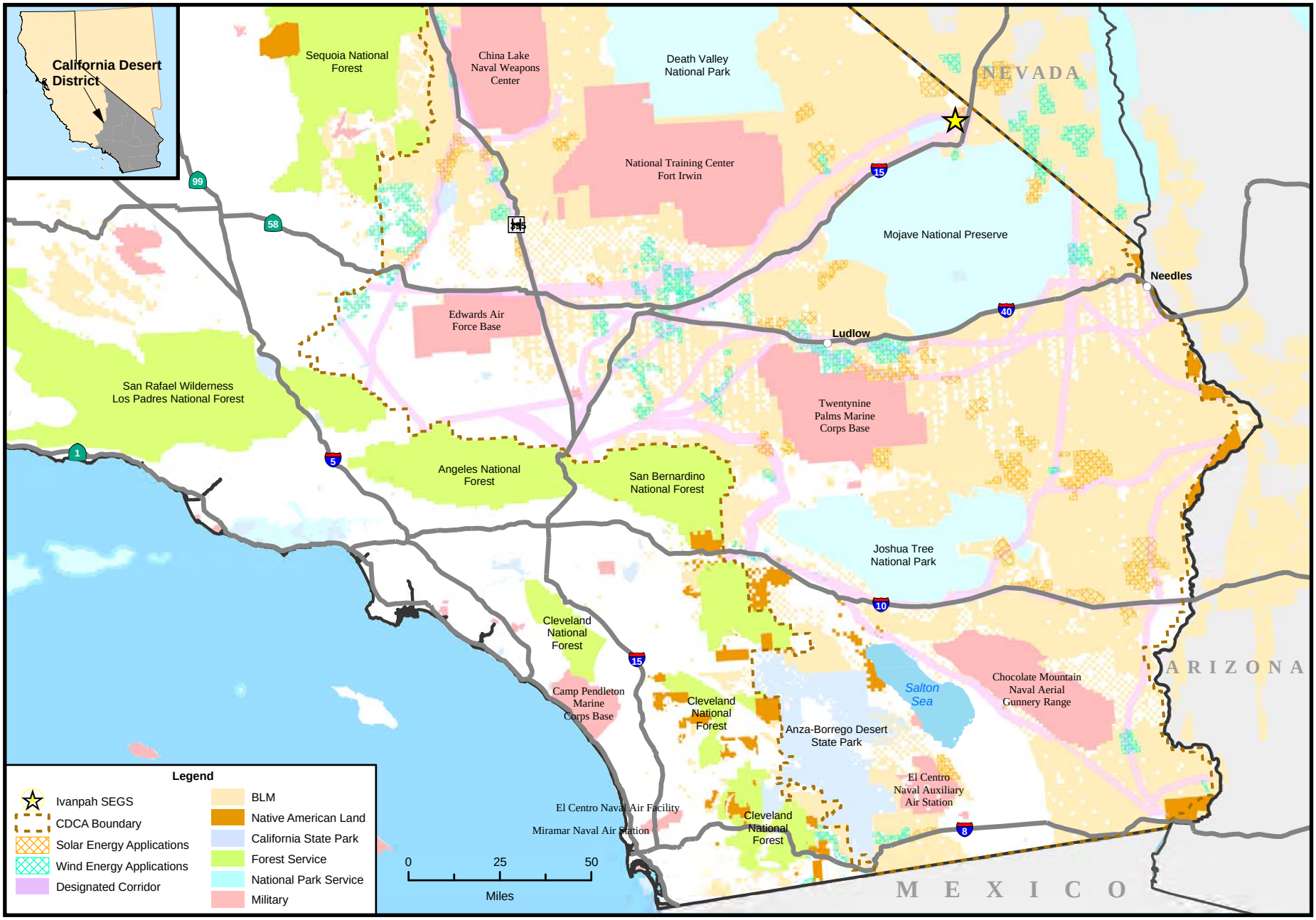
Solar Millennium2009a--Solar Millennium (tn: 52939). Application for Certification Vol 1 & 2, dated 8/24/2009.

West-wide Energy Corridor Programmatic EIS Information Center. < http://corridoreis.anl.gov/> Accessed November 2009.

MARCH 2010

CUMULATIVE IMPACTS - FIGURE 1

Genesis Solar - Regional Renewable Applications



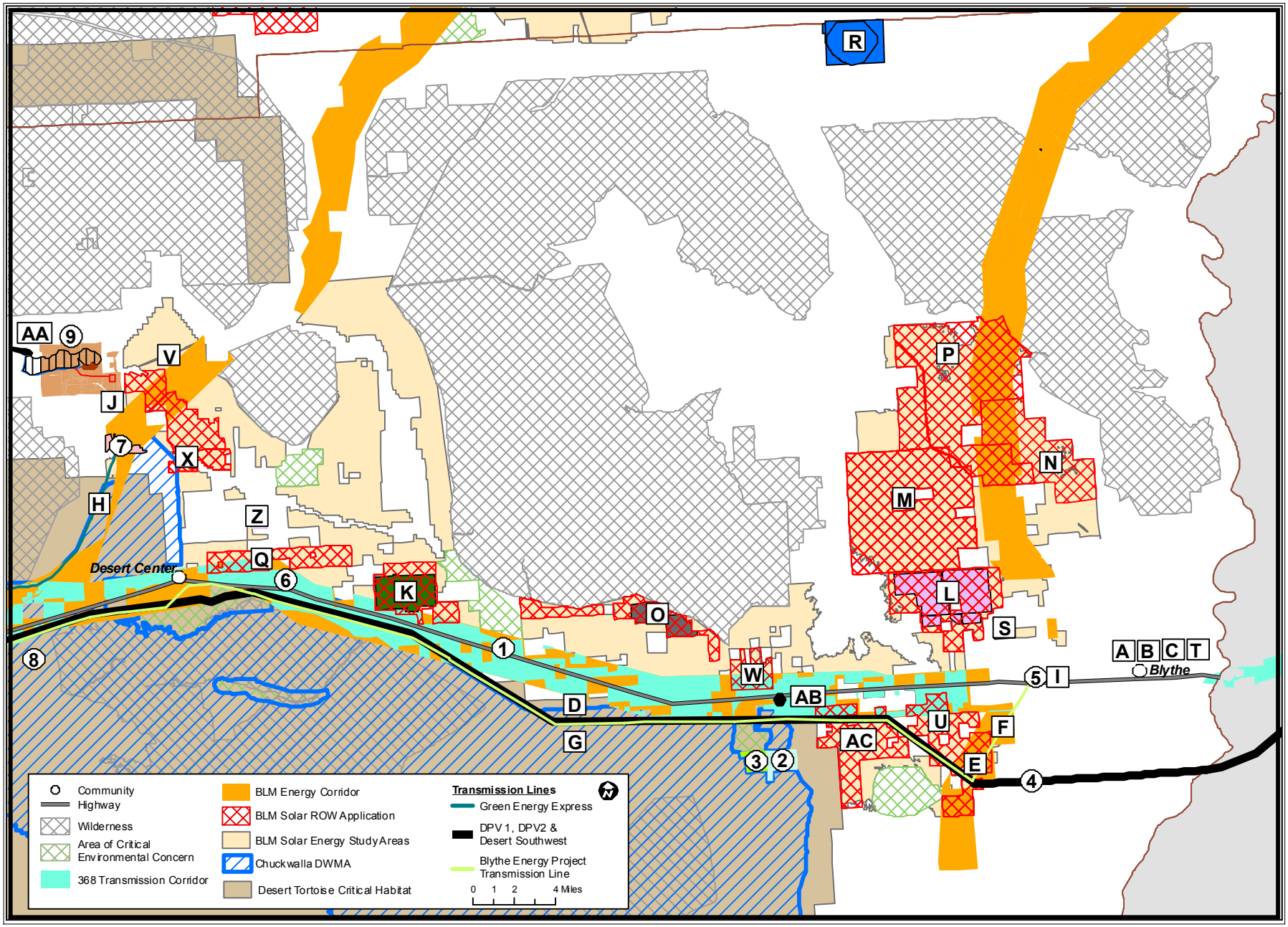
CUMULATIVE IMPACTS

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010

SOURCE: California Energy Commission

CUMULATIVE IMPACTS - FIGURE 2

Genesis Solar - Existing and Future/Foreseeable Projects



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, MARCH 2010

SOURCE: California Energy Commission, Bureau of Land Management