CHAPTER 4
Environmental Consequences

4.1 Introduction

This chapter assesses environmental consequences or impacts that would result from the implementation of proposed action or the alternatives described in Chapter 2. These analyses consider both short-term impacts during construction and decommissioning, and long-term impacts during operations. The scope of the impact analyses presented in this chapter is commensurate with the level of detail for the alternatives provided in Chapter 2, Alternatives Including the Proposed Action, and the availability and/or quality of data necessary to assess impacts. Baseline conditions for assessing the potential environmental impacts are described in Chapter 3.

The impact assessment that follows focuses on the general impacts that could occur as a result of implementing each of the alternatives. The methodology for this assessment conforms with the guidance found in the following sections of the CEQ regulations for implementing NEPA: 40 CFR Section 1502.24, *Methodology and Scientific Accuracy*; 40 CFR Section 1508.7, *Cumulative Impact*; and 40 CFR Section 1508.8, *Effects*. The CEQ regulations require agencies to "rigorously explore and objectively evaluate" the impacts of the alternatives. This chapter discusses short-and long-term direct, indirect and cumulative impacts of the proposed action and alternatives; identifies mitigation measures to address adverse impacts; and summarizes the residual and unavoidable adverse impacts on an issue-by-issue basis.

4.1.1 Analytical Assumptions

The following impacts analysis was conducted with the following assumptions:

1. The laws, regulations, and policies applicable to BLM authorizing ROW grants for renewable energy development facilities would be applied consistently for all action alternatives.

2. The proposed facility would be constructed, operated, maintained and decommissioned as described in each action alternative.

3. Short-term impacts are those expected to occur during the construction phase and the first five years of the operation and maintenance phase. Long-term impacts are those that would occur after the first five years of operation.

4.1.2 Types of Effects

The potential impacts from those actions that would have direct, indirect, and cumulative effects were considered for each resource. Effects and impacts as used in this document are synonymous and could be beneficial or detrimental.

Direct effects are caused by the action and occur at the same time and place as the action; indirect effects are caused by the action and occur later in time or further in distance, but are still reasonably foreseeable. 40 CFR 1508.8. Cumulative impacts are those effects resulting from the incremental impacts of an action when combined with other past, present, and reasonably foreseeable future actions (regardless of which agency or person undertakes such actions). 40 CFR 1508.7. Cumulative impacts could result from individually insignificant but collectively significant actions taking place over a period of time. Short-term impacts occur only for a short time after implementation of a management action; for example, construction noise impacts from construction activities would be considered short-term. By contrast, long-term effects occur for an extended period after implementation of a management action; for example, operational noise during power plant operations would be a long-term impact, as it would last for as long as the plant is in operation.

Section 1502.16 of the CEQ regulations forms the scientific and analytic basis for the comparisons of alternatives as described under Section 1502.14, Alternatives including the Proposed Action. The environmental consequences chapter (PA/FEIS Chapter 4) consolidates the discussions of those elements required by sections 102(2)(C)(i), (ii), (iv), and (v) of NEPA which are within the scope of this EIS and as much of Section 102(2)(C)(iii) as is necessary to support the comparisons. The discussion includes the environmental impacts of the alternatives, including any 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 which would be involved in the proposal should it be implemented.

4.1.3 Resources and Resource Uses Not Affected or Present in the Action Area

Resources, BLM program areas or other aspects of the human environment that are not affected or present in the BSPP area include: environmental justice; wild and scenic rivers; national scenic or historic trails, monuments, recreation areas, or conservation areas; cooperative management and protection areas; outstanding natural areas; forest reserves; back country byways; wetlands; livestock grazing; and wild horse and burros.

4.1.4 Cumulative Scenario Approach

This PA/FEIS analyzes the cumulative impact of the construction, operation and maintenance, closure and decommissioning of the ROW grant and all other elements of the proposed action, taking into account the effects in common with other past, present, and reasonably foreseeable future actions. The cumulative effects analysis highlights past actions that are closely-related

either in time or space (i.e., temporally or in geographic proximity) to the proposed action, present actions that are ongoing at the same time this EIS was being prepared; and reasonably foreseeable future actions, including those for which there are existing decisions, funding, formal proposals, or which are highly probable, based on known opportunities or trends.

The intensity, or severity, of the cumulative impacts analysis considers 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). Varying degrees of information exist about projects within the cumulative scenario. Therefore, for resource areas were quantitative information is available, a quantitative analysis is provided; however, if said level of detail is not available, a qualitative analysis is provided. If the proposed action and alternatives would have no direct or indirect effects on a resource, the PA/FEIS does not analyze potential cumulative effects on that resource. See, for example, Section 4.1.3, Resources and Resource Uses Not Affected or Present in the Action Area.

For the proposed action, the cumulative scenario includes projects identified in Table 4.1-1 (Cumulative Scenario). Table 4.1-1 identifies each resource or BLM program, the cumulative analysis impacts area (which is the geographic scope for each cumulative effects issue), elements to consider, and which renewable projects, other BLM authorized actions and other known actions or activities are located or would occur within the cumulative analysis impacts area. Most of the projects listed below have been, are being, or would be required to undergo their own independent environmental review under NEPA or CEQA or both, as applicable. Figure 6 identifies existing and reasonably foreseeable future projects along the I-10 Corridor. Table 4.1-2 identifies projects in the immediate vicinity of the I-10 corridor.

With the exception of climate change, which is a global issue, the BLM has identified the California desert as the largest area within which cumulative effects should be assessed for all disciplines. However, within the desert region, the specific area of cumulative effect varies by resource. For each resource, the geographic scope of analysis is based on the topography surrounding the BSPP and the natural boundaries of the resource affected, rather than jurisdictional boundaries. The geographic scope of cumulative effects often extends beyond the scope of the direct effects, but not beyond the scope of the direct and indirect effects of the proposed action and alternatives. Table 4.1-1 identifies the relevant geographic scope for each discipline’s analysis of cumulative impacts.

In addition, each project in a region would have its own implementation schedule, which may or may not coincide or overlap with the proposed action’s schedule. This is a consideration for short-term impacts from the BSPP. 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 proposed BSPP.

TABLE 4.1-1
CUMULATIVE SCENARIO

Resource or BLM Program	Cumulative Analysis Impact Area	Elements to Consider	BLM Renewable Energy Projects	Other BLM Authorized Actions	Other Known Actions/Activities
Air Resources	Mojave Desert Air Basin	PM2.5, PM10, ozone	Blythe, Genesis, Rice, Palen, Desert Sunlight, Chuckwalla, Eagle Crest Pump Storage, Nextera McCoy, Bullfrog Big Maria Vista, Desert Quartzite, EnXco, Desert Lily Soleil, Mule Mountain Solar, Associated Gen-tie Trans Lines,	Eagle Mtn Landfill, D-PV2, Colorado River Substation, Red Bluff Substation, DSW Trans Line, OHV, LTVAs,	I-10, Blythe Airport Solar 1, Chuckwalla Valley Raceway,
Global Climate Change	International, national and regional	CO2e	All		
Cultural Resources	Cultural sites, traditional use areas, and cultural landscapes on the plant site, along the linear facilities corridor and in the general vicinity of the site, including along the I 10 corridor	Ground-disturbing activities and the cultural character of the site and its vicinity. Cultural resources, including archaeological (prehistoric and historic), and ethnographic resources.	See Figure 9, which includes:		
			Blythe, Genesis, Rice, Palen, Desert Sunlight, Chuckwalla, Eagle Crest Pump Storage, Nextera McCoy, Bullfrog Big Maria Vista, Desert Quartzite, EnXco, Mule Mountain Solar, Associated Gen-tie Trans Lines, etc.	Eagle Mtn Landfill, D-PV2, Colorado River Substation, Red Bluff Substation, DSW Trans Line, OHV, LTVAs. Etc.	Blythe Airport Solar 1, Chuckwalla Valley Raceway, various commercial and residential projects, etc.
Lands and Realty	Eastern Riverside County	Designated utility corridors (e.g., transmission lines, cellular telephone towers, poles), existing ROWs, I-10	Blythe, Genesis, Rice, Palen, Desert Sunlight, Chuckwalla, Eagle Crest Pump Storage, Bullfrog Big Maria Vista, Desert Quartzite, EnXco, Desert Lily Soleil, Mule Mountain Solar, Associated Gen-tie Trans Lines,	Eagle Mtn Landfill, D-PV2, Colorado River Substation, Red Bluff Substation, DSW Trans Line, OHV, LTVAs,	Blythe Airport Solar 1, Chuckwalla Valley Raceway,
Multiple Use Classes	CDCA Plan areas bearing the multiple use class designation “Limited”	Restriction or preclusion of otherwise allowable use opportunities	McCoy Soleil, Mule Mountain Solar, maybe also Red Bluff Substation	None	Blythe Airport Solar 1; First Solar’s Blythe
Noise	See Figure 44, Noise Measurement Locations and Noise Contours	Equipment, motor vehicles, high pressure steam blow	None	None	None
Paleontological Resources	Eastern Riverside County	Ground-disturbing activities; rock units with potential high sensitivity or known paleontological resources	Blythe, Genesis, Rice, Palen, Desert Sunlight, Chuckwalla, Eagle Crest Pump Storage, Nextera McCoy, Bullfrog Big Maria Vista, Desert Quartzite, EnXco, Desert Lily Soleil, Mule Mountain Solar, Associated Gen-tie Trans Lines,	Eagle Mtn Landfill, D-PV2, Colorado River Substation, Red Bluff Substation, DSW Trans Line, OHV, LTVAs,	Blythe Airport Solar 1, Chuckwalla Valley Raceway,

TABLE 4.1-1 (Continued)
CUMULATIVE SCENARIO

Resource or BLM Program	Cumulative Analysis Impact Area	Elements to Consider	BLM Renewable Energy Projects	Other BLM Authorized Actions	Other Known Actions/Activities
Public Health and Safety					
Hazardous materials/ hazardous waste	Mojave Desert Air Basin, watershed, groundwater basin, with focus on and in the vicinity of the site	Releases, spills, emissions, bacteria; ground disturbance that exposes existing subsurface conditions; engineering and administrative controls; health risks	See Air Resources, above; see also, Water Resources, below, in this Table 4.1-1.		
Waste management	California Desert, with emphasis on Riverside County	Solid and liquid wastes	Blythe, Genesis, Rice, Palen, Desert Sunlight, Chuckwalla, Eagle Crest Pump Storage, Nextera McCoy, Bullfrog Big Maria Vista, Desert Quartzite, EnXco, Desert Lily Soleil, Mule Mountain Solar, Associated Gen-tie Trans Lines	Eagle Mtn Landfill, D-PV2, Colorado River Substation, Red Bluff Substation, DSW Trans Line, OHV, LTVAs,	Blythe Airport Solar 1, Chuckwalla Valley Raceway,
Transmission line safety and nuisance	Immediate vicinity of the proposed line	Interference with radio-frequency communication; noise; fire hazards; hazardous shocks; nuisance shocks; and electric and magnetic field (EMF) exposure	Big Maria Vista Solar, Blythe Energy Project Transmission Line, Colorado River Substation and Expansion, Desert Quartzite, Palen, Chuckwalla Solar I	West-wide Section 368 Energy Corridors, Devers-Palo Verde Transmission Line, Blythe Energy Project	Interstate 10
Aviation safety	Air space governed by the Blythe Airport Land Use Compatibility Plan	Navigable airspace; reflectivity and temporary flash occurrences; radio frequency emissions and potential interference; thermal plumes; height and location of structures; clear space within Compatibility Zone D; bird strike and avian-aviation incompatibilities	All		
Traffic and transportation safety	I-10 corridor	Equipment that exceeds roadway load or size limits; hazardous materials transport	Same as Cultural Resources, above.		
Worker safety and fire protection	BSPP site and linear facilities corridor; jurisdictional boundary of the Riverside County Fire Department (RCFD) plus mutual aid agencies	Site access; fire response; hazardous materials response; advanced life support/paramedic services; disaster preparedness	Blythe, Genesis, Rice, Palen, Desert Sunlight, Chuckwalla, Eagle Crest Pump Storage, Nextera McCoy, Bullfrog Big Maria Vista, Desert Quartzite, EnXco, Desert Lily Soleil, Mule Mountain Solar, Associated Gen-tie Trans Lines	Eagle Mtn Landfill, D-PV2, Colorado River Substation, Red Bluff Substation, DSW Trans Line, OHV, LTVAs,	Blythe Airport Solar 1, Chuckwalla Valley Raceway,

TABLE 4.1-1 (Continued)
CUMULATIVE SCENARIO

Resource or BLM Program	Cumulative Analysis Impact Area	Elements to Consider	BLM Renewable Energy Projects	Other BLM Authorized Actions	Other Known Actions/Activities
Geologic hazards	BSPP site and linear facilities corridor	Accelerated and/or environmentally harmful soil erosion; corrosive soils; earthquake fault ruptures; earthquake induced ground deformations (e.g. lateral spreading, subsidence, liquefaction, or collapse), or otherwise unstable soils; landslides.	Big Maria Vista Solar, Blythe Energy Project Transmission Line, Colorado River Substation and Expansion, Desert Quartzite, Palen, Chuckwalla Solar I	West-wide Section 368 Energy Corridors, Devers-Palo Verde Transmission Line, Blythe Energy Project	Interstate 10
Recreation	California Desert, with emphasis on eastern Riverside County	Dispersed recreational opportunities and experiences, ACECs, LTVAs	Blythe, Genesis, Rice, Palen, Desert Sunlight, Chuckwalla, Eagle Crest Pump Storage, Nextera McCoy, Bullfrog Big Maria Vista, Desert Quartzite, EnXco, Desert Lily Soleil, Mule Mountain Solar, Associated Gen-tie Trans Lines	Eagle Mtn Landfill, D-PV2, Colorado River Substation, Red Bluff Substation, DSW Trans Line, OHV, LTVAs,	Blythe Airport Solar 1, Chuckwalla Valley Raceway,
Social Economics	Social: Eastern Riverside County Economic: Riverside County	Flow of goods and services; impacts to local infrastructure and services; ability to meet housing demand; employment/labor demand; possible positive impacts to regional economic sectors and/or adverse community impacts; severance or other tax benefits; ability of communities to absorb impacts.	Blythe, Genesis, Rice, Palen, Desert Sunlight, Chuckwalla, Eagle Crest Pump Storage, Nextera McCoy, Bullfrog Big Maria Vista, Desert Quartzite, EnXco, Desert Lily Soleil, Mule Mountain Solar, Associated Gen-tie Trans Lines,	Eagle Mtn Landfill, D-PV2, Colorado River Substation, Red Bluff Substation, DSW Trans Line, OHV, LTVAs,	Blythe Airport Solar 1, Chuckwalla Valley Raceway,
Soil Resources	Mojave Desert Air Basin and watershed	Erosion	See Air Resources, above; see also, Water Resources, below, in this Table 4.1-1.		
Special Designations	Wilderness Areas within sight or hearing distance of the site (i.e., Palen/McCoy, Big Maria Mountains and Little Chuckwalla Mountains Wilderness Areas); more generally, the I-10 corridor	Views, glint, glare, noise, recreation	See related resource sections in this Table 4.1-1.		
Transportation and Public Access	Transportation: Eastern Riverside County, focusing on the I-10 corridor Public Access: NECO Plan area	Construction traffic – materials and workers OHV recreation opportunities, changes in viewscape, unauthorized routes;	I-10 Corridor: Same as Cultural Resources, above. NECO Plan Area: See Figure 56, including BSPP, Genesis, Palen, Chuckwalla, First Solar/Desert Sunlight, etc.; see also cumulative projects identified for Vegetation Resources, below.		

TABLE 4.1-1 (Continued)
CUMULATIVE SCENARIO

Resource or BLM Program	Cumulative Analysis Impact Area	Elements to Consider	BLM Renewable Energy Projects	Other BLM Authorized Actions	Other Known Actions/Activities
Vegetation Resources	NECO Plan area	Ephemeral drainages and natural communities; special status plants; stabilized and partially stabilized dunes and sand transport corridors; invasive plants	See generally, Figure 56.		
			Blythe, Genesis, Rice, Palen, Desert Sunlight, Chuckwalla, Eagle Crest Pump Storage, Nextera McCoy, Bullfrog Big Maria Vista, Desert Quartzite, EnXco, Desert Lily Soleil, Mule Mountain Solar, Associated Gen-tie Trans Lines,	Eagle Mtn Landfill, D-PV2, Colorado River Substation, Red Bluff Substation, DSW Trans Line, OHV, LTVAs,	Blythe Airport Solar 1, Chuckwalla Valley Raceway,
Visual Resources	I-10 corridor; Figure 23	Project appearance; construction-related dust, light, glint and glare; views from key observation points	See Figure 9 and Figure 23, which include, for example:		
			Blythe, Genesis, Rice, Palen, Desert Sunlight, Chuckwalla, Eagle Crest Pump Storage, Nextera McCoy, Bullfrog Big Maria Vista, Desert Quartzite, EnXco, Desert Lily Soleil, Mule Mountain Solar, Associated Gen-tie Trans Lines,	Eagle Mtn Landfill, D-PV2, Colorado River Substation, Red Bluff Substation, DSW Trans Line, OHV, LTVAs,	Blythe Airport Solar 1, Chuckwalla Valley Raceway,
Water Resources					
Surface water	Watershed	Hydrology and quality	Blythe, Nextera McCoy, Bullfrog Big Maria Vista, Desert Quartzite, Mule Mountain Solar, Associated Gen-tie Trans Lines,	D-PV2, Colorado River Substation, DSW Trans Line, OHV, LTVAs,	First Solar Blythe, Blythe Airport Solar 1,
Groundwater	Palo Verde Mesa Groundwater Basin	Basin balance, levels and quality	Blythe, Nextera McCoy, Bullfrog Big Maria Vista, Desert Quartzite, Mule Mountain Solar	Colorado River Substation, DSW Trans Line, OHV, LTVAs,	First Solar Blythe, Blythe Airport Solar 1,
Wildland and Fire Ecology	Eastern Riverside County	Mortality of plants and wildlife, loss of forage and cover; changes to the vegetation communities; spread of invasive plants; consequences of subsequent extreme weather events; air quality	Blythe, Genesis, Rice, Palen, Desert Sunlight, Chuckwalla, Eagle Crest Pump Storage, Nextera McCoy, Bullfrog Big Maria Vista, Desert Quartzite, EnXco, Desert Lily Soleil, Mule Mountain Solar, Associated Gen-tie Trans Lines	Eagle Mtn Landfill, D-PV2, Colorado River Substation, Red Bluff Substation, DSW Trans Line, OHV, LTVAs,	Blythe Airport Solar 1, Chuckwalla Valley Raceway,
Wildlife Resources	Recovery Plan Area defined by NECO; Critical Habitat Unit defined by USFWS/CDFG; existing range or eastern Riverside County	Desert Tortoise, Mojave fringe-toed lizard, Couch's spadefoot toad, migratory birds, golden eagle, western burrowing owl, American badger, kit fox, Nelson's big horn sheep. Also, mortality and injury; special status wildlife; wildlife movement and connectivity; indirect impacts, including from lighting, collisions and climate change.	Blythe, Genesis, Rice, Palen, Desert Sunlight, Chuckwalla, Eagle Crest Pump Storage, Nextera McCoy, Bullfrog Big Maria Vista, Desert Quartzite, EnXco, Desert Lily Soleil, Mule Mountain Solar, Associated Gen-tie Trans Lines,	Eagle Mtn Landfill, D-PV2, Colorado River Substation, Red Bluff Substation, DSW Trans Line, OHV, LTVAs,	Blythe Airport Solar 1, Chuckwalla Valley Raceway,

TABLE 4.1-2
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: CEC, RSA (June 2010) Section B.3.4, Table 1A.

Renewable Energy Projects Included in the Cumulative Scenario

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. In addition, nearly 80 applications for solar and wind projects are being considered on BLM land in Nevada and Arizona. (CEC RSA June 2010) Renewable energy projects in BLM's California Desert District are identified in Table 4.1-2.

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 will complete the environmental review process, and not all projects will be funded and constructed. It is unlikely that all of these projects will be constructed for the following reasons:

1. 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.

2. As part of approval by the appropriate Lead Agency under NEPA and/or CEQA (generally the BLM and/or Energy Commission), 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 ROW grant. The large size of these projects may result in permitting challenges related to endangered species, mitigation measures or requirements, and other issues.

3. 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.

The BLM reviewed the list of renewable energy projects on State and private lands that the Energy Commission evaluated (RSA Table 1B) and determined that several among them do not meet the standard for consideration within the NEPA Cumulative Analysis. Reasons include: (i) BLM's NEPA Handbook H-1790-1 states, "Analyzing future actions, such as speculative developments, is not required;"(ii) Where information about the status of a potential upcoming project is not available, it is impossible to determine what impacts would result from its construction, operation, maintenance or ultimate decommissioning and, without this data, there can be no reasoned analysis of additive, countervailing or synergistic effects; and (iii) a cumulative impact analysis appropriately is concerned with impacts that are sufficiently likely to occur and not with guesswork about possible projects that can be conceived of or imagined. Accordingly, the following renewable energy (wind and solar) projects that were considered by the Energy are not considered by the BLM:

1. *In Humboldt County*: Bear River Ridge (70 MW);

2. *In Shasta County*: Padoma Wind Energy (175 MW);

3. *In Montezuma Hills, Solano County*: Shiloh III (200 MW); Montezuma Wind II (52-60); and Montezuma Hills Wind Project (34-37 MW);

4. *In Sacramento County*: Rancho Seco Solar Thermal (15-17 MW solar trough);

5. *In Contra Costa County*: Tres Vaqueros (42 MW wind repower);

6. *In Stanislaus County*: Stanislaus Solar Project I (20 MW solar PV) and Stanislaus Solar Project II (20 MW solar PV);

7. *In Kings County*: Sun City Project Phase 1 (20 MW solar PV) and Synapse Solar 2 (20 MW solar PV/solar thermal);

8. *In Kern County*: Maricopa Sun Solar Complex (350 MW Solar PV); Panoche Ranch Solar Farm (250 MW Solar PV); Monte Vista (126 MW Solar PV); Lost Hills (32.5 solar PV); Tehachapi Photovoltaic Project (20 MW solar PV); T, squared, Inc. (19 MW solar PV); Global Real Estate Investment Partners, LLC (solar PV); Recurrent Energy (solar PV); Man-Wei Solar (solar PV); Regenesis Power for Kern County Airports Dept.; Manzana Wind Project (246 MW); Pine Canyon (150 MW); and Aero Tehachapi (65 MW).

9. *In San Bernardino County*: Boulevard Associates (20 MW solar PV);

10. *In Los Angeles County*: Gray Butte Solar PV (150 MW Solar PV) and NRG Alpine Suntower (40 MW solar PV and 46 MW solar thermal);

11. *In Brawley / Imperial County*: Orni 18, LLC Geothermal Power Plant (49.9 MW) and Black Rock Geothermal 1,2,and 3; and

12. *In the City of Vernon*: City of Vernon Wind Energy Project (300 MW).

Solar, wind and geothermal energy projects identified and analyzed by the Energy Commission as being on State and private lands that also are considered by the BLM are identified in Table 4.1 3. Proposed solar energy projects within BLM's cumulative scenario also are shown on Figure 9.

Other BLM-Authorized Actions and Known Actions/Activities in the Cumulative Scenario

Other existing BLM authorized actions and other known actions/activities along the I-10 corridor in Eastern Riverside County are identified in Table 4.1-4.

Other future foreseeable projects along the I-10 corridor in Eastern Riverside County are identified in Table 4.1-5.

4.1.5 Mitigation Measures Included in the Analysis

For impacts identified in the following resource sections, mitigation measures have been developed that would be implemented during all appropriate phases of the project from initial ground breaking, to operations, and through closure and decommissioning. The mitigation measures include a combination of the following:

1. Measures that have been proposed by the applicant;

2. Conditions of Certification (COCs) proposed by the California Energy Commission;

3. Regulatory requirements of other federal, state, and local agencies;

4. USFWS terms and conditions identified in the Biological Opinion; and

5. Additional BLM-proposed mitigation measures, standard right-of-way (ROW) grant terms and conditions, and best management practices.

TABLE 4.1-3
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
San Joaquin Solar 1 and 2 (107 MW Solar hybrid)	Fresno	Under environmental review
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
Abengoa Mojave Solar Project (250 MW solar thermal)	San Bernardino County, Harper Lake	Under environmental review
Rice Solar Energy Project (150 MW solar thermal)	Riverside County, north of Blythe	Under environmental review
3 MW solar PV energy generating facility	San Bernardino County, Newberry Springs	MND published for public review
Blythe Airport Solar 1 Project (100 MW solar PV)	Blythe, California	MND published for public review
First Solar's Blythe (21 MW solar PV)	Blythe, California	Under construction
California Valley Solar Ranch (SunPower) (250 MW solar PV)	Carrizo Valley, San Luis Obispo County	Under environmental review
LADWP and OptiSolar Power Plant (68 MW solar PV)	Imperial County, SR 111	Under environmental review
Topaz Solar Farm (First Solar) (550 MW solar PV)	Carrizo Valley, San Luis Obispo County	Under environmental review
AV Solar Ranch One (230 MW solar PV)	Antelope Valley, Los Angeles County	Under environmental review
Bethel Solar Hybrid Power Plant (49.4 MW hybrid solar thermal and biomass)	Seeley, Imperial County	Under environmental review
Mt. Signal Solar Power Station (49.4 MW hybrid solar thermal and biomass)	8 miles southwest of El Centro, Imperial County	Under environmental review
Wind 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
Iberdrola Tule Wind (200 MW)	San Diego County, McCain Valley	EIR/EIS in progress
AES Daggett Ridge (84 MW)	San Bernardino	EIS in progress
Granite Wind, LLC (81 MW)	San Bernardino	EIR/EIS in progress
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

SOURCE: CEC RSA June 2010 Section B.3.4, Table 1A. The CEC compiled this list 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.

TABLE 4.1-4
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

TABLE 4.1-4 (Continued)
EXISTING PROJECTS ALONG THE I-10 CORRIDOR (Eastern Riverside County)

ID #	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
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 multiple Long-Term Visitor Areas. See PA/FEIS Chapter 3.13.
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

SOURCE: CEC RSA June 2010 Section B.3.4, Table 2.

These requirements are generically referred to as "Mitigation Measures" throughout this PA/FEIS. Because these Mitigation Measures are derived from a variety of sources, they also are required, and their implementation regulated, by the various agencies. This, in turn, is the project description that has been presented to the USFWS for consultation and is the project description upon which the terms and conditions of the Biological Opinion are based. The Applicant is required to comply with the terms and conditions of the Biological Opinion.

Many of the other mitigation measures are required by agencies other than the BLM and their implementation will be enforced by those other agencies against the Applicant. For instance, FWS's Endangered Species Act Section 7 Mitigation Measures will be included in the Record of Decision (ROD), and the National Historic Preservation Act Section 106 Programmatic Agreement will include a number of processes that also will be included in the ROD. The Applicant will be required by the ROD and the ROW grant to comply with the requirements of those other agencies (see, e.g., 43 CFR 2805.12(a) (Federal and state laws and regulations), (i)(6) (more stringent state standards for public health and safety, environmental protection and siting, constructing, operating, and maintaining any facilities and improvements on the ROW). Any non-compliance with implementation of these other Federal or state requirements may impact the approval status of the ROD and ROW grant.

TABLE 4.1-5
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 and reasonably foreseeable Expansion	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. Expand substation into a full 500/220 kV substation on approximately 90 acres of land.
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 4.1-5 (Continued)
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	Permitted, not constructed	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
K	Palen Solar Power Project	North of I-10, 10 miles east of Desert Center	Solar Millennium LLC/Chevron Energy	Undergoing environmental review, construction to begin beginning of 2011.	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	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.
M	Mule Mountain Soleil Project	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.

TABLE 4.1-5 (Continued)
FUTURE FORESEEABLE PROJECTS ALONG THE I-10 CORRIDOR (Eastern Riverside County)

ID #	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
N	McCoy 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.
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.
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 fourth 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.

TABLE 4.1-5 (Continued)
FUTURE FORESEEABLE PROJECTS ALONG THE I-10 CORRIDOR (Eastern Riverside County)

ID #	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
W	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.
X	Eagle Mountain Soleil	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
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.

TABLE 4.1-5 (Continued)
FUTURE FORESEEABLE PROJECTS ALONG THE I-10 CORRIDOR (Eastern Riverside County)

ID #	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
Additional Projects Outside Cumulative Figure Boundaries						
	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.

NOTE:

[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.

SOURCE: CEC, RSA (June 2010) Section B.3.4, Table 3.

As noted above, the BLM recognizes that the Energy Commission COCs are not generally within the enforcement authority of the BLM since the CEC COCs are requirements originating in State law and regulation. While the Applicant must comply with these measures, they are not directly enforceable by the BLM except in the general sense referred to above. For those COCs that are also within the enforcement authority of the BLM because of overlapping authorities, the BLM incorporates those COCs into its ROW grant as its own terms and conditions subject to its enforcement authority. Appendix G contains a list of COCs and denotes those measures that will be monitored and managed by the CEC, and those that will be subject to joint administration between the BLM and CEC.

In some instances, the BLM identified potential impacts to public land resources that would not be and have not been identified as mitigation measures required by these other agencies. In these instances, individual mitigation measures have been developed by the BLM and incorporated into the ROW grant, and will be monitored and managed solely by the BLM. In addition, standard terms and conditions for approval of the use of public land have been identified in the ROD and incorporated into the proposed ROW grant and therefore will be enforced by the BLM as part of any ROW grant approved for the project.

4.1.6 Terms and Conditions found in FLPMA and BLM ROW Regulations

Title V of the Federal Land Policy and Management Act of 1976 addresses the issuance of ROW authorizations on public land. The BLM has identified all the lands that will be occupied by facilities associated with the BSPP that are needed for its construction, operation, and maintenance. The general terms and conditions for all public land rights of way are described in FLPMA section 505, and include measures to minimize damage and otherwise protect the environment, require compliance with air and water quality standards, and compliance with more stringent state standards for public health and safety, environmental protection, siting, construction, operation, and maintenance of ROWs. The Secretary may prescribe additional terms and conditions as s/he deems necessary to protect Federal property, provide for efficient management, and among other things, generally protect the public interest in the public lands subject to or lands adjacent thereto. For this project, terms and conditions have been incorporated into the ROW that are necessary to protect public safety, including security fencing and on-site personnel. The environmental consequences analysis in the EIS identifies impacts and mitigation measures to reduce/eliminate impacts. The mitigation measures identified by the BLM and incorporated as a term and condition of the ROW grant provide those actions necessary to prevent unnecessary or undue degradation of the public lands as required by FLPMA section 302. The additional mitigation measures that are identified and described in the EIS and that will be enforced by the other agencies, as noted above, provide additional protection to public land resources.

Specifically, the PA/FEIS identifies recommended mitigation measures that would:

1. Require compliance with Mojave Desert Air Quality Management District State regulations, reduce carbon emissions, and minimize dust;

2. Require planning and compliance with Federal, State and local agency requirements for drainage, erosion and sediment control, wastewater management, groundwater use and monitoring, and stormwater control and monitoring;

3. Require measures to protect public health and safety including traffic control, transmission line standards, and worker safety plans; and

4. Require biological resource mitigation and cultural resources mitigation to protect sensitive environmental resources and cause the least damage to the environment and protect the public interest, while allowing the project to be constructed.

Finally, all BLM ROW grants are approved subject to regulations contained at 43 CFR 2800. Those regulations specify that the BLM may, at any time, change the terms and conditions of a ROW grant "as a result of changes in legislation, regulations, or as otherwise necessary to protect public health or safety or the environment." 43 CFR 2805.15(e).

The BLM will monitor conditions and review any ROW grant issued for the BSPP to evaluate if future changes to the grant terms and conditions are necessary or justified under this provision of the regulations to further minimize or reduce impacts resulting from the project.

If approved, the solar energy ROW authorization will include diligent development terms and conditions, consistent with the requirements of 43 CFR 2805.12(i)(5). Failure of the holder to comply with the diligent development terms and conditions provides the BLM authorized officer the authority to suspend or terminate the authorization (43 CFR 2807.17).

If approved, the solar energy ROW authorization would include a required "Performance and Reclamation" bond to ensure compliance with the terms and conditions of the ROW authorization, consistent with the requirements of 43 CFR 2805.12(g). The "Performance and Reclamation" bond will consist of three components. The first component will be hazardous materials, the second component will be the decommissioning and removal of improvements and facilities, and the third component will address reclamation, revegetation, restoration and soil stabilization.

4.2 Impacts on Air Resources

4.2.1 Impact Assessment Methodology

Dispersion Modeling Assessment

This impact assessment focuses on the general air quality impacts that could occur as a result of implementing the proposed action or alternatives. The methodology for this assessment conforms with the guidance found in the CEQ regulations for implementing NEPA. See, 40 CFR 1502.24 (Methodology and Scientific Accuracy); 40 CFR 1508.7 (Cumulative Impact), and 40 CFR 1508.8 (Effects).

The CEQ regulations require that agencies rigorously explore and objectively evaluate the impact of the alternatives. Under NEPA, the BLM considered the Applicant's use of the U.S. Environmental Protection Agency guideline American Meteorological Society/EPA Regulatory Model (AERMOD) to estimate ambient impacts from BSPP construction and operation. This is consistent with the Energy Commission's consideration of impacts of the BSPP and alternatives in the RSA.

In accordance with the Federal Clean Air Act (CAA) requirements, the air quality in a given region or area is measured by the concentrations of various pollutants in the atmosphere. The measurement of these criteria pollutants in ambient air are expressed in units of parts per million (ppm) or micrograms per cubic meter (μg/m3). The air quality in a region is a result of not only the types and quantities of atmospheric pollutants and pollutant sources in an area, but also surface topography and the prevailing meteorological conditions. This analysis evaluates the expected air quality impacts from emissions of criteria air pollutants from the construction and operation of the BSPP and its alternatives.

To evaluate impacts on air quality using AERMOD, the construction emission sources for the site were grouped into two categories: equipment (off-road equipment); and vehicles (on-road equipment), where the exhaust and fugitive dust emissions for each type were calculated for particulate matter modeling. Emissions from onsite equipment engines and fugitive dust emission sources were modeled as area sources. Similar modeling procedures were used by the Applicant to determine impacts from the operating maintenance vehicle exhaust and fugitive dust emissions, while the stationary sources (boilers, heaters, engines, cooling towers) were modeled as point sources.

This air dispersion model provides a means of predicting the location and ground level magnitude of the impacts of a new emissions source. These models consist of several complex series of mathematical equations, which are repeatedly calculated by a computer for many ambient conditions to provide theoretical maximum offsite pollutant concentrations for short-term (one-hour, three-hour, eight-hour, and 24-hour) and annual periods. The model results are generally described as maximum concentrations, often described as a unit of mass per volume of air, such as micrograms per cubic meter ($\mu g/m^3$).

The inputs for the air dispersion model include four power blocks with stack information (exhaust flow rate, temperature, and stack dimensions), specific engine and vehicle emission data and meteorological data, such as wind speed, atmospheric conditions, and site elevation. For this proposed action, the meteorological data used as inputs to the model included hourly wind speeds and directions measured at the Blythe Airport meteorological station during 2002 through 2004.

For the determination of one-hour average and annual average construction NOx concentrations the Ozone Limiting Method (OLM) was used to determine worst-case near field NO_2 impacts. The NOx emissions from internal combustion sources, such as diesel engines, are primarily in the form of nitric oxide (NO) rather than NO_2. The NO converts into NO_2 in the atmosphere, primarily through the reaction with ambient ozone, and NOx OLM assumes full conversion of stack NO emission with the available ambient ozone. The NOx OLM method used assumed an initial NO_2/NOx ratio of 0.1 for all NOx emission sources. Actual monitored hourly background ozone data from Niland, California were used for all of 2002 and January through April of 2003, and Blythe monitoring data were used from May 2003 through 2004, based on data availability, to provide ozone data that corresponds with the years of meteorological data that were used to calculate maximum potential NO to NO_2 conversion to determine the maximum hourly NO_2 impacts.

The Applicant has also provided a modeling analysis to show compliance during operation with the new federal one-hour NO_2 standard (Galati & Blek 2010f). This modeling analysis, also using the AERMOD dispersion model, includes the use of the NOx_OLM modeling option and used a post-processor developed by the Applicant to also add in the actual hourly NO_2 background data and determine the 98th percentile of daily maximums (eighth highest) for each modeled receptor location. The NOx_OLM option considers that the emissions of NOx are initially primarily in the form of NO that over time oxidizes, primarily through a reaction with ozone, to NO_2. The initial NO_2/NOx ratio was set at the default value of 0.1 and the conversion of the rest of the NOx to NO_2 is assumed to be limited by the hourly ambient ozone concentration. For this modeling analysis, the Applicant obtained hourly monitored ozone and NO_2 concentration data, concurrent with the 2002 to 2004 meteorological data, as noted above for ozone, and from Palm Springs for NO_2. While using ozone and NO_2 concentration data from the same source is preferred, the remoteness of the site and limited number of stations made this an unreasonable option. However, the use of the older ambient ozone and NO_2 background data is conservative, as the ambient concentrations for both have been dropping since the 2002 to 2004 period (CEC, RSA June 2010, C.1-22).

Background concentrations provided by the Applicant were replaced where appropriate[1] with the available highest ambient background concentrations from the last three years at the most representative monitoring stations as shown in Table 4.2-1. The information presented in Table 4.2-1 has been updated since the publication of the DEIS to use peak values from 2007 to 2009 background data for gaseous pollutants (2009 data was not yet available); the updated information shows an improvement in worst-case background concentrations for many of the

[1] This does not include the background for the federal one-hour NO_2 standard since the Applicant's modeling analysis uses actual monitored NO_2 concentrations to determine the combined BSPP plus background average 98th percentile 1-hour NO_2 impacts.

TABLE 4.2-1
BACKGROUND CONCENTRATIONS (μg/m^3)

Pollutant	Averaging Time	Recommended Background	Limiting AAQS[b]	Percent of Standard
NO_2	1 hour	119	339	35
	Annual	19	57	33
CO	1 hour	2645	23,000	12
	8 hour	878	10,000	9
PM10	24 hour	83	50	166
	Annual	30.5	20	153
PM2.5	24 hour[a]	20.5	35	59
	Annual	8.7	12	73
SO_2	1 hour	23.6	655	4
	3 hour	15.6	1,300	1
	24 hour	13.1	105	12
	Annual	3.5	80	4

NOTES:
[a] PM2.5 24-hour data shown are 98th percentile values which is the basis of the ambient air quality standard and the basis for determination of the recommended background concentration.
[b] The limiting AAQS is the most stringent of the CAAQS or NAAQS for that pollutant and averaging period.

SOURCE: ARB 2009c, U.S.EPA 2009b and Energy Commission Staff Analysis

criteria pollutants included in the air dispersion modeling analysis. Modeled impacts to these background concentrations were added, and the results were then compared with the ambient air quality standards for each respective air contaminant to determine whether the BSPP's emission impacts would cause a new exceedance of an ambient air quality standard or would contribute to an existing exceedance.

Construction Modeling Analysis

The total duration of proposed construction is estimated to be approximately 69 months and would include the construction of the solar field and the four identical units, each with its own power block. The total fenced facility would cover 5,950 acres, and the permanent disturbance area of the proposed BSPP would be approximately 7,025 acres, including rerouted drainage channels and access roads outside of the fence line. Construction elements of the BSPP would include the four solar power plants (power block and solar array, as well as other ancillary facilities such as the administration buildings, warehouse, and parking lot), an approximately ten-mile natural gas supply pipeline, an electric transmission line to a substation located approximately five miles to the southwest, access roads, and rerouted drainage channels.

Combustion emissions would result from the off-road construction equipment, including diesel construction equipment used for site grading, excavation, and construction of onsite structures; off-road construction equipment used at the onsite batch plant; and on-road vehicles, including heavy duty diesel trucks used to deliver materials, other on-road diesel trucks used during construction, and worker personal vehicles and pickup trucks used to transport workers to and

from and around the construction site. Fugitive dust emissions would result from site grading/excavation activities; construction of power plant facilities, roads, and switchyard; the use of an onsite batch plant; the installation of the new transmission line, the new gas pipeline, and the new onsite water pipelines; and vehicle travel on paved and unpaved roads. There also would be emissions associated with the use of an onsite fuel depot.

The annual emissions for the shorter duration offsite construction activities are based on the following construction durations:

1. Access Road Construction – two months
2. Gas Pipeline Construction – four months
3. Transmission Line Construction – eight months

Using estimated peak hourly, daily and annual construction equipment exhaust emissions, the Applicant modeled the proposed BSPP's construction emissions to determine impacts (Solar Millennium 2010a). To determine the construction impacts on ambient standards (i.e. one-hour through annual) it was assumed that the emissions would occur during a daily construction schedule of 10-hour days from March through September (7 am to 5 pm) and eight hour days from October through February (8 am to 4 pm).

The predicted proposed BSPP pollutant concentration levels were added to a conservatively estimated background of existing emission concentration levels (Table 4.2-1) to determine the cumulative effect. Table 4.2-2 presents the results of the Applicant's modeling analysis. The construction-related maximum daily emissions modeling analysis for the BSPP, including both the onsite fugitive dust and vehicle tailpipe emission sources, is summarized in Table 4.2-3, and maximum annual emissions are summarized in Table 4.2-4.

TABLE 4.2-2
MAXIMUM BSPP CONSTRUCTION IMPACTS

Pollutants	Avg. Period	Project Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	Standard ($\mu g/m^3$)	Percent of Standard
NO_2 [a]	1-hr.	335.9	NA	335.9	339	99
	Annual	4.3	19	23.3	57	41
CO	1-hr	1,068.7	2,645	3,714	23,000	16
	8-hr	423.6	877	901	10,000	9
PM10	24	43.0	83	126	50	252
	Annual	3.9	30.5	34.4	20	172
PM2.5	24	14.4	20.5	34.9	35	99
	Annual	0.6	8.7	9.3	12	77
SO_2	1-hr	3.4	23.6	27.0	665	4
	3-hr	2.3	15.6	17.3	1,300	1
	24	0.6	13.1	13.7	105	13
	Annual	0.01	3.5	3.5	80	4

NOTE: Modeled 1-hour NO_2 concentrations were determined using the OLM method with time-matched ambient NO_2background.

SOURCE: Galati & Blek2010f, Table 2-2 of Attachment A.

TABLE 4.2-3
BSPP CONSTRUCTION – MAXIMUM DAILY EMISSIONS (lbs/day)

	NOx	VOC	CO	PM10	PM2.5	SOx
Onsite Construction Emissions						
Main Power Block (entire BSPP)						
Off-road Equipment Exhaust	832.61	88.15	464.35	35.57	26.89	1.82
On-road Equipment Exhaust	27.77	2.33	14.63	1.34	1.23	0.04
Asphaltic Paving	--	0.00	--	--	--	--
Fugitive Dust from Paved Roads	--	--	--	6.06	2.76	--
Fugitive Dust from Unpaved Roads	--	--	--	614.07	61.44	--
Fugitive Dust from Constr. Activities	--	--	--	246.38	76.35	--
Batch Plant Emissions	*17.86*	*1.30*	*9.84*	*17.48*	*17.48*	*0.03*
Fuel Depot	--	*3.50*	--	--	--	--
Subtotal - Power Block Onsite Emissions	**878.24**	**95.28**	**488.82**	**920.90**	**186.15**	**1.89**
Power Block On-road Equipment (offsite)	328.27	45.67	403.89	101.98	51.66	0.77
Access Road Construction (offsite)	211.84	24.20	92.78	114.92	39.87	0.45
Gas Pipeline Construction (offsite)	14.83	1.99	8.79	7.85	2.78	0.03
Transmission Line Construction (offsite)	13.67	1.55	15.81	8.30	3.02	0.03

NOTE: Emissions that were not added may not be additive due to occurring at different times during the construction schedule, and all emissions include fugitive dust as appropriate.

SOURCE: AECOM 2010a, Tables E.2-7, E.2-10, E.2-12 & E.2-14, Galati & Blek2010f.

TABLE 4.2-4
BSPP CONSTRUCTION - MAXIMUM ANNUAL EMISSIONS (tons/year)

	NOx	VOC	CO	PM10	PM2.5	SOx
Construction Emissions						
Main Power Block (entire BSPP)						
Off-road Equipment Exhaust	96.27	10.34	54.68	4.35	3.29	0.21
On-road Vehicles (onsite and offsite)	3.45	0.30	1.84	0.14	0.13	0.00
Asphaltic Paving	--	0.01	--	--	--	--
Fugitive Dust from Paved Roads	--	--	--	0.68	0.31	--
Fugitive Dust from Unpaved Roads	--	--	--	68.77	6.88	--
Fugitive Dust from Constr. Activities	--	--	--	26.95	8.29	--
Batch Plant Emissions	*2.14*	*0.16*	*1.18*	*2.30*	*2.30*	*0.00*
Fuel Depot	--	*0.64*	--	--	--	--
Subtotal - Power Block Emissions	***101.86***	***11.45***	***57.70***	***103.19***	***21.20***	***0.22***
Power Block On-road Equipment (offsite)	34.60	5.00	43.97	11.19	5.71	0.08
Access Road Construction (offsite)	4.66	0.53	2.04	2.53	0.88	0.01
Gas Pipeline Construction (offsite)	0.64	0.09	0.38	0.34	0.12	0.00
Transmission Line Construction (offsite)	0.87	0.10	1.10	0.63	0.23	0.00

NOTE: Emissions that were not added may not be additive due to occurring at different times during the construction schedule, and all emissions include fugitive dust as appropriate.

SOURCE: AECOM 2010a, Tables E.2-7, E.2-10, E.2-12 & E.2-14, Galati & Blek2010f.

Operation Modeling Analysis

Using estimated peak hourly, daily and annual operating emissions, the Applicant modeled the BSPP's operation emissions to determine impacts. This modeling analysis was revised to address the changes to the BSPP description (Galati & Blek 2010f), and includes the local cumulative sources that are discussed later in the Cumulative Impacts section. The predicted proposed BSPP and cumulative sources pollutant concentration levels were added to conservatively estimated worst-case maximum background concentration levels (Table 4.2-1) to determine the cumulative effect. Table 4.2-5 presents the results of the Applicant's modeling analysis of operations-phase emissions. This analysis includes emissions from the stationary sources for all four power blocks and the onsite fugitive dust and vehicle tailpipe emission sources estimated by the Applicant. Table 4.2-6 presents operation-related maximum daily emissions modeling analysis for the BSPP. Table 4.2-7 presents operation-related maximum annual emissions modeling analysis for the BSPP. The following are the stationary and mobile emission source operating assumptions that were used to develop the operation emissions estimates for the BSPP:

Stationary emission sources (total equipment for all four power blocks):

a. Auxiliary boiler (4 total): 35 MMBtu per hour natural gas-fired auxiliary boiler used for start up. Maximum daily operation would be limited to 12 hours per day at full load and five hours per day at 25 percent load. Annual operation would be limited to 5,100 hours (600 hours at a full load and 4,500 hours at 25 percent load).

b. Emergency fire water pump engine (four total): 300 hp diesel-fired engine. Tested once a week, up to one-hour test, not to exceed 50 hours per year.

c. Emergency generator engine (four total): 2,922 hp diesel-fired engine. Tested once a week, up to one-hour test, not to exceed 50 hours per year.

d. Two-cell auxiliary wet cooling tower (four total two-cell units): 6,034 gallons per minute cooling tower to remove residual heat from balance of plant (BOP) equipment. Each cooling tower would have a maximum run time of 24 hours per day and 8,760 hours per year.

e. One fuel depot consisting of two, 2,000 gallon on-road vehicle diesel tanks, two 8,000-gallon off-road vehicle diesel tanks, one 500-gallon gasoline tank, and a wash water holding tank. The fuel farm would include secondary spill containment, a covered maintenance area, also with secondary containment, and a concrete pad for washing vehicles.

f. HTF ullage system (four total). Vented up two hours per day and 400 hours per year.

g. HTF piping system (four total). Assumes 3,050 valves, four pump seals, 7,594 connectors, and 10 pressure relief valves each. The HTF piping system fugitive emissions have been recalculated by staff, consistent with the procedures developed by Kern County Air Pollution Control District that consider the properties of the HTF during the daily operation cycle, where it is assumed that for 16 hours per day the HTF in the piping system is consistent with the properties of a light liquid and for 8 hours per day the HTF in the piping system is consistent with the properties of a heavy liquid. The specific emission factors used are set forth in Table 4.2-8.

TABLE 4.2-5
BSPP OPERATION EMISSION IMPACTS

Pollutants	Avg. Period	Project Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	Standard ($\mu g/m^3$)	Percent of Standard
NO2	1-hr CAAQS	168.5	119	288	339	85
	1-hr NAAQS	178.7	NA	178.7	188	95
	Annual	0.90	19	19.9	57	35
CO	1-hr	267.6	2,645	2,913	23,000	13
	8-hr	86.5	878	965	10,000	10
PM10	24	22.3	83	105.3	50	211
	Annual	2.7	30.5	33.2	20	166
PM2.5	24	2.9	20.5	23.4	35	67
	Annual	0.8	8.7	9.5	12	79
SO2	1-hr	7.4	23.6	31.0	665	5
	3-hr	3.1	15.6	18.7	1,300	1
	24-hr	0.8	13.1	13.9	105	13
	Annual	0.1	3.5	3.6	80	5

SOURCE: Galati & Blek2010f, Air Quality Table 11.

TABLE 4.2-6
BSPP OPERATIONS – MAXIMUM DAILY EMISSIONS (lbs/day)

	NOx	VOC	CO	PM10	PM2.5	SOx
Onsite Operation Emissions						
Auxiliary Boilers	20.61	9.28	69.69	18.55	18.55	0.50
Emergency Fire Pump Engines	7.53	0.40	6.87	0.40	0.40	0.01
Emergency Generators	117.39	6.18	66.94	3.86	3.86	0.12
Auxiliary Cooling Towers	---	---	---	2.90	2.90	---
HTF Vents	---	185.78	---	---	--	---
HTF Piping Fugitives	---	17.51	---	---	--	---
Onsite Maintenance Vehicles	2.25	0.23	1.34	809.84	81.06	0.02
Fuel Depot	--	0.48	--	--	--	--
Subtotal of Onsite Emissions	***147.78***	***219.86***	***144.84***	***835.55***	***106.77***	***0.66***
Offsite Emissions						
Delivery Vehicles	8.30	0.61	2.32	0.62	0.44	0.01
Employee Vehicles	4.72	4.94	47.02	9.74	4.56	0.07
Subtotal of Offsite Emissions	***13.02***	***5.55***	***49.34***	***10.36***	***5.00***	***0.08***
Total Maximum Daily Emissions	**160.80**	**225.41**	**194.18**	**845.91**	**111.77**	**0.74**

SOURCE: AECOM 2010a, Table E.3-9b and Table E.2-7e (Blythe Data Response Emissions.xlsx), and CEC staff estimate for employee vehicles and HTF fugitives, Galati & Blek2010f, initial comments on SA/EIS.

TABLE 4.2-7
BSPP OPERATIONS – MAXIMUM ANNUAL EMISSIONS (tons/yr)

	NOx	VOC	CO	PM10	PM2.5	SOx
Onsite Operation Emissions						
Auxiliary Boilers	1.34	0.60	4.54	1.21	1.21	0.03
Emergency Fire Pump Engines	0.19	0.01	0.17	0.01	0.01	0.0003
Emergency Generators	2.93	0.15	1.67	0.10	0.10	0.0031
Auxiliary Cooling Towers	---	---	---	0.53	0.53	---
HTF Vents	---	0.60	---	---	--	---
HTF Fugitives	---	33.90	---	---	--	---
Onsite Maintenance Vehicles	0.22	0.02	0.15	72.69	7.28	0.00
Fuel Depot	--	0.09	--	--	--	--
Subtotal of Onsite Emissions	**4.68**	**35.37**	**6.53**	**74.54**	**9.12**	**0.04**
Offsite Emissions						
Delivery Vehicles	1.52	0.11	0.42	0.12	0.08	0.00
Employee Vehicles	0.86	0.90	8.58	1.78	0.83	0.01
Subtotal of Offsite Emissions	**2.38**	**1.01**	**9.00**	**1.90**	**0.91**	**0.01**
Total Maximum Annual Emissions	**7.06**	**36.38**	**15.53**	**76.44**	**10.04**	**0.06**

SOURCE: AECOM 2010a, Table E.3-9b and Table E.2-7e (Blythe Data Response Emissions.xlsx), and CEC staff estimate for employee vehicles and HTF fugitives, Galati & Blek2010f, initial comments on SA/EIS.

TABLE 4.2-8
EMISSION FACTORS

Piping Component	Light Liquid Emission Factor (lb/hr/source)	U.S.EPA Reference Table	Heavy Liquid Emission Factor (lb/hr/source)	U.S.EPA Reference Table
Valves	5.55E-04	Table 2-9 (100 ppm)	1.90E-05	Table 2-4 (Heavy Oil)
Pump Seals	1.86E-03	Table 2-9 (100 ppm)	5.30E-05	Table 2-12 (Zero Factor)
Flanges/Connectors	1.65E-05	Table 2-12 (Zero Factor)	1.65E-05	Table 2-12 (Zero Factor)
Pressure Relief Valves	9.85E-02	Table 2-5 (<10,000 ppm)	1.90E-05	Table 2-4 (Heavy Oil)

NOTE: for pressure relief valves the in service emission factors are for gas service, rather than light liquid service.

SOURCE: USEPA 1995 as cited in the CEC RSA June 2010.

These emission factors may not assume appropriate control efficiencies for the inspection and maintenance program required by MDAQMD. This emission estimate will be revised as determined necessary and appropriate pursuant to adaptive management principles, after further consideration of the effectiveness of the inspection and maintenance program.

Mobile emissions sources:

a. Estimates included emissions for employee trips, assuming 221 employees per day averaging 30 miles round trip per employee.

b. Mobile emissions sources required for operation and maintenance were estimated by the Applicant based on vehicle miles traveled (VMT) and operating hours. For

example, a mirror washing cycle or event can be completed in 10 days, which would allow for approximately 36 washing events per year, but it was assumed that washing would only be required once a week during October through March and twice a week during April through September, for a total of 78 washing events per year (AECOM 2010a, DR-AIR-14, Galati and Blek, 2010f). Each mobile source has different basis for emissions estimates as provided in the Applicant's revised emission estimate spreadsheets (AECOM 2010a).

Closure and Decommissioning

The anticipated lifespan of the BSPP is estimated to be 30-40 years. Closure and decommissioning-related impacts would occur from the onsite and offsite emissions that would result when the facility is dismantled and the site is restored. Such impacts would be a one-time, limited-duration event. Given expected advances in fuel efficiency and other air quality control-related advancements, it would be speculative to project the types and volumes of air emissions that would be associated with the construction and other equipment that would be necessary to decommission the BSPP. Nonetheless, as a conservative worst-case scenario, air quality impacts associated with the ultimate decommissioning of the BSPP are evaluated using the same methods as initial construction emissions, as discussed above, and are anticipated to be comparable in type and magnitude, but likely to be lower than, construction-related emissions.

4.2.2 Discussion of Direct and Indirect Impacts

Proposed Action

The modeling analysis for both the construction and operation phases indicates that, with the exception of 24-hour and annual PM10 impacts that the BSPP would not create new exceedances or contribute to existing exceedances for any of the modeled air pollutants. The conditions that would create worst-case project modeled impacts (low wind speeds) are not the same conditions when worst-case background is expected for PM10/PM2.5. Additionally, the worst-case PM2.5 and PM10 impacts occur at the fence line and drop off quickly with distance. Therefore, the impacts, when including mitigation measures, would not contribute substantially to exceedances of the PM10 CAAQS in downwind areas.

Ozone

There are air dispersion models that can be used to quantify ozone impacts, but they are used for regional planning efforts where hundreds or even thousands of sources are input into the model to determine ozone impacts. There are no regulatory agency models approved for assessing single source ozone impacts. However, because of the known relationship of NOx and VOC emissions to ozone formation, it can be said that the emissions of NOx and VOC from the BSPP do have the potential (if left unmitigated) to contribute to higher ozone levels in the region.

PM2.5 Impacts

Secondary particulate formation, which is assumed to be 100 percent PM2.5, is the process of conversion from gaseous reactants to particulate products. The process of gas-to-particulate

conversion, which occurs downwind from the point of emission, is complex and depends on many factors, including local humidity and the presence of air pollutants. The basic process assumes that the SOx and NOx emissions are converted into sulfuric acid and nitric acid first and then react with ambient ammonia to form sulfate and nitrate. The sulfuric acid reacts with ammonia much faster than nitric acid and converts completely and irreversibly to particulate form. Nitric acid reacts with ammonia to form both a particulate and a gas phase of ammonium nitrate. The particulate phase would tend to fall out; however, the gas phase can revert back to ammonia and nitric acid. Thus, under the right conditions, ammonium nitrate and nitric acid establish a balance of concentrations in the ambient air.

The emissions of NOx and SOx from BSPP do have the potential (if left unmitigated) to contribute to higher PM2.5 levels in the region; however, the region is in attainment with PM2.5 standards and the low level of NOx and SOx emissions from the BSPP would not result in an increase such to cause non-attainment.

Regional Air Quality Improvement

The BSPP would have indirect emission reductions from fossil-fuel fired power plant electrical generation. This would be due to the BSPP displacing the need for their operation, since solar renewable energy facilities would operate on a must-take basis.[2] However, the exact nature and location of such reductions is not known.

Alternatives

Reconfigured Alternative

Impacts would be essentially the same as the proposed action. The increase in footprint of 150 acres would have a minimally greater effect than the proposed action.

Reduced Acreage Alternative

Peak construction impacts would be the same as the proposed action since construction activity levels are estimated to be similar. Long term construction impacts would be less since the construction period would be reduced. Operation impact levels would be reduced since only three of the four proposed units would be built and operated.

No Action Alternative A

No impacts to air quality would occur since the BSPP would not be constructed and operated.

[2] This refers to the fact that the contract between the owner of this solar power facility and the utility will require that the utility take all generation from this facility with little or no provisions for the utility to direct turn down of generation from the facility.

No Action Alternative B

No impacts to air quality would occur since the BSPP would not be constructed and operated. Furthermore, no impacts could occur from future solar development; however, impacts to air quality could result from the development of other renewable energy projects (i.e., wind) or other uses allowable under Multiple Use Class L.

No Action Alternative C

No impacts to air quality would occur since the BSPP would not be constructed and operated. Future impacts would be possible should another application be received. Any impacts would be analyzed as a part of the permitting process. Impacts could be comparable to, greater or less than those of the proposed action, depending on the nature and intensity of the proposed use.

4.2.3 Discussion of Cumulative Impacts

Cumulative effects are defined 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 actions" (40 CFR 1508.7).

Impacts resulting from construction, operation, maintenance and decommissioning of the BSPP and its alternatives could result in a cumulative effect on air quality when combined with the air quality impacts of other past, present, or reasonably foreseeable future actions. The geographic scope of the cumulative effects analysis for air quality consists of the Mojave Desert Air Basin, which is comprised of four air districts: the Kern County APCD (governing the eastern portion of Kern County), the Antelope Valley AQMD (governing the northeastern portion of Los Angeles County), the Mojave Desert AQMD (San Bernardino County and eastern-most Riverside County), and the eastern portion of the South Coast AQMD (eastern Riverside County). This geographic scope of cumulative impacts analysis was established based on the natural boundaries of the affected resource, and not on jurisdictional boundaries. Potential cumulative effects on air quality could be short-term (i.e., limited to the BSPP's proposed 69-month construction period) or long-term (i.e., occur during the projected 30-40 year lifespan of the proposed action).

This analysis is concerned with criteria air pollutants. Such pollutants have impacts that are usually (though not always) cumulative by nature. Although possible, rarely would an individual project alone cause a violation of a Federal or state criteria pollutant AAQS. However, a new source of pollution may contribute to violations of criteria pollutant AAQSs because of existing background sources or foreseeable future projects. Air districts try to attain the criteria pollutant AAQSs by adopting attainment plans that provide a programmatic approach to such attainment. Depending on the air district, these plans typically include requirements for air offsets and the use of Best Available Control Technology (BACT) for new sources of emissions, and restrictions of emissions from existing sources of air pollution.

Consequently, most of the preceding impacts discussion reflects cumulative impacts with the BSPP or alternatives. For example existing conditions within the cumulative impacts area reflect a combination of the natural condition and the effects of past actions; existing conditions are described in PA/FEIS Section 3.2, *Air Quality*, and background concentrations of various pollutants are summarized in Table 4.2-1. Direct and indirect effects of the construction and operation of the BSPP are analyzed above within this context. (Results of the BSPP-specific construction modeling analysis, including onsite fugitive dust and vehicle tailpipe emission sources, are provided in Table 4.2-2. See also Tables 4.2-3 and 4.2.4.). This Subsection 4.2.3 provides additional analysis related to cumulative impacts concerning the project's emissions combined with other local major emission sources.

Past, present and reasonably foreseeable future actions making up the cumulative scenario are identified in Section 4.1. Among them, projects that would be developed within the same air basin as the BSPP (i.e., in eastern Kern County, northeastern Los Angeles County, San Bernardino County and eastern Riverside County) could contribute to short-term or long-term pollutant concentration levels. There are a number of other large development projects proposed in the region. For example, other utility-scale solar energy projects, such as the Genesis, Rice, Palen and Desert Sunlight solar power projects, are expected to contribute air pollutants in comparable amounts as the BSPP. Other, non-renewable energy projects are expected to contribute construction-related air pollutants, including fugitive dust and tailpipe emissions, in amounts consistent with the intensity and duration of each project's construction period, although operations-related air emissions would differ. Cumulative impacts would vary by alternative to the BSPP only to the degree to which direct and indirect impacts would vary by alternative. This potential for substantial new development in the Mojave Desert Air Basin and corresponding increase in emissions within the air basin requires the incorporation of mitigation measures to avoid or reduce the potential contribution of the BSPP to cumulative air quality impacts. Those measures are summarized below.

4.2.4 Summary of Mitigation Measures

The implementation of mitigation measures imposed by the Energy Commission as Conditions of Certification for the BSPP also would avoid or reduce impacts on the quality of the human environment. These mitigation measures are set forth in Appendix G. The following mitigation measures would avoid or minimize impacts on air resources:

AQ-SC1, AQ-SC2, AQ-SC3, AQ-SC4, AQ-SC5, AQ-SC6, AQ-SC8

AQ-1, AQ-2, AQ-3, AQ-4, AQ-5, AQ-6, AQ-7, AQ-9, AQ-10, AQ-11, AQ-12, AQ-13, AQ-14, AQ-15. AQ-16, AQ-17, AQ-18, AQ-19, AQ-20, AQ-21, AQ-22, AQ-23, AQ-24, AQ-25, AQ-26, AQ-27, AQ-28, AQ-29, AQ-30, AQ-31, AQ-32, AQ-33, AQ-34, AQ-35, AQ-36, AQ-37, AQ-38, AQ-39, AQ-40, AQ-41, AQ-42, AQ-43, AQ-44, AQ-45, AQ-46, AQ-47, AQ-48, AQ-49, AQ-50, AQ-51, AQ-52, AQ-53, AQ-54, AQ-55, AQ-56, AQ-57, AQ-58, AQ-59, AQ-60, AQ-61, AQ-62, AQ-63, AQ-64

4.2.5 Residual Impacts after Mitigation Measures were Implemented

Residual Air Quality impacts are the emissions associated with construction and operation as outlined in Tables 4.2-4 and 4.2-5.

4.2.6 Unavoidable Adverse Impacts

None.

4.3 Impacts to Global Climate Change

4.3.1 Impact Assessment Methodology

The methodology to assess impacts to climate change under NEPA is continuing to evolve as consensus forms as to how best to evaluate such effects on proposed action-specific and cumulative levels. The CEQ published draft guidance on February 18, 2010 for Federal agencies to improve their consideration of the effects of greenhouse gas (GHG) emissions and climate change in their evaluation of proposals for Federal actions under NEPA. For example, the CEQ proposes that agencies should consider the direct and indirect GHG emissions from the action and to quantify and disclose those emissions in the environmental document (40 CFR 1508.25). The CEQ further proposes that agencies should consider mitigation measures to reduce proposed action-related GHG emissions from all phases and elements of the proposed action and alternatives over its/their expected life, subject to reasonable limits based on feasibility and practicality.

For the BSPP and alternatives, this Section 4.3 carefully considers detailed information about the potential for construction-, operation-, maintenance- and decommissioning-related activities to emit GHGs and, thereby, contribute meaningfully to global warming in light of the combined emissions of other broad-scale causes of climate change. GHG emissions are quantified and set forth in Tables 4.3-1 and 4.3-2. Although it is doubtful that this individual project, standing alone, could result in significant climate change effects, the PA/FEIS considers the “incremental impact” of BSPP emissions as a possible contributor, together with the incremental impacts of other past, present, and reasonably foreseeable actions, to cause global climate change, which intrinsically is a cumulative issue. Mitigation measures are considered. Additionally, as discussed in Section 3.3, *Global Climate Change*, agencies under the U.S. Department of the Interior are required to consider potential impact areas associated with climate change, including potential changes in flood risk, water supply, sea level rise, wildlife habitat and migratory patterns, invasion of exotic species, and potential increases in wildfires.

Analysis of Cumulative Impacts

Construction, operation, maintenance and decommissioning of the BSPP and alternatives would emit GHGs that, together with emissions of past, present, and reasonably foreseeable future actions, could contribute to climate change. BSPP-specific GHG emissions are considered in the context of this cumulative impacts analysis. However, because electricity from the BSPP is expected to displace electricity generated from fossil fuels, the BSPP would result in a net reduction in GHG emissions. Although the cumulative scenario described in Section 4.1 generally includes activities in the California desert and highlights projects along the I-10 corridor, the geographic scope of the cumulative effects analysis for climate change is much broader: it is both regional and global. Potential cumulative effects, whether adverse or beneficial, on climate change could be short-term (i.e., limited to the BSPP’s proposed 69-month construction period) or long-term (i.e., occur during the projected 30-40 year lifespan of the proposed action).

Existing conditions within the cumulative impacts area reflect a combination of the natural condition and the effects of past actions. Recent years have seen record-high average global surface temperatures; in fact, the past 20 years include the 18 warmest years on record since 1850 (Pew, 2008). This warming trend could result from several factors that influence the earth's climate, including natural factors, such as changes in solar radiation and volcanic activity, and anthropogenic (or human-caused) factors, such as the release of GHGs to the atmosphere and land-cover changes (Pew, 2008). Though climate science is complex, compelling evidence exists demonstrating that human activities associated with fossil fuel burning and land use are primarily responsible for the changing global climate.

The US Supreme Court has held that climate change impacts are reasonably foreseeable, are caused in part by human activities, and should be regulated as pollutants under the Clean Air Act. *Massachusetts et al. v. Environmental Protection Agency*, 549 U.S. 497 (2007). Additionally, several states have enacted legislation establishing reduction targets for GHG emissions. For example, the California legislature adopted Assembly Bill 32, the Global Warming Solutions Act of 2006 (AB 32), which requires the California Air Resources Board to develop regulations that will reduce greenhouse gas emissions to 1990 levels by 2020 (Health and Safety Code Section 38500 et seq., 17 CCR 95100 et seq.). Additionally, State regulations prohibit utilities from entering into long-term contracts with any base load facility that does not meet a greenhouse gas emission standard of 0.5 metric tonnes carbon dioxide per megawatt-hour (0.5 MTCO2/MWh) or 1,100 pounds carbon dioxide per megawatt-hour (1,100 lbs CO2/MWh) (20 CCR 2900 et seq.). Although AB 32 and similar state laws and regulations do not apply to federal agencies, NEPA does require that environmental documents consider the relationship between proposed federal actions and state environmental protection legislation. California's state-specific policies, including GHG goals, are discouraging or prohibiting new contracts and new investments in high GHG-emitting facilities such as coal-fired generation, generation that relies on water for once-through cooling, and aging power plants (CEC 2007). Some existing plants are likely to require substantial capital investments in order to continue operating in light of these policies and may instead be retired or be replaced. For additional discussion of relevant federal level regulations and requirements for assessing the potential impacts of climate change, please refer to Section 3.3. The BSPP could provide 2,100 GWh per year of renewable energy to partially offset the resulting loss in supply.

4.3.2 Direct and Indirect Impacts of the Proposed Action on Climate Change

Although the system to deliver adequate and reliable electricity supply is complex and variable, it operates as an integrated whole to meet demand, such that the dispatch of a new source of generation generally curtails or displaces one or more less efficient or less competitive existing sources. The BSPP would provide a new, utility-scale source of solar energy to complement existing and proposed sources of renewable energy. When the sun shines and electricity is generated by the BSPP, the real-time output required from fossil fuel plants would be reduced by the amount of renewable generation going into the electrical grid to maintain the balance between the supply and demand for electricity. As analyzed below, construction of the BSPP would

involve the use of construction equipment and operation of motor vehicles and operation of the BSPP would involve the generation of electricity using fossil fuels, at least to the extent required to operate any back-up generators at the thermal solar plant. Thus, construction and operation of the BSPP would produce GHGs.

Construction of the BSPP

Construction of industrial facilities such as power plants requires coordination of numerous equipment and personnel. The estimated 69-month construction period for the BSPP would require on-site construction activities that would result in short-term, unavoidable increases in vehicle and equipment emissions, including GHGs. The GHG emissions estimate, for the entire construction period, provided by the Applicant is provided in Table 4.3-1.

TABLE 4.3-1
BSPP CONSTRUCTION-RELATED GREENHOUSE GAS EMISSIONS

Construction Element	CO_2-Equivalent (MTCO2E)[a,b,c]
On-Site Construction Equipment	70,700
On-Site Motor Vehicles	1,800
Off-Site Motor Vehicles	31,400
Construction Total	***103,900***

NOTES:
[a] One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms
[b] The vast majority of the CO2E emissions, over 99 percent, is CO_2 from these combustion sources.
[c] This does not include the revised construction description that now includes an onsite concrete batch plant and on-site fuel depot. On balance staff believes that these changes will not significantly impact the totals, which might be estimated to be higher or lower depending the balance of how concrete and fuel deliveries would have been handled versus the deliveries of the materials to make concrete (sand, aggregate, cement, water) and daily fueling of equipment by fuel/lube truck(s).

SOURCE: Solar Millennium 2010x, Table DR-AIR-6-1.

In addition to direct emission of GHGs, construction of this 5,950-acre proposed action also would cause the clearing of land and complete removal of vegetation over most of the project site. This would reduce the ongoing natural carbon uptake by vegetation. A study of the Mojave Desert indicated that the desert may uptake carbon in amounts as high as 100 grams per square meter per year (Wohlfahrt et. al. 2008). This would equate to a maximum reduction in carbon uptake, calculated as CO_2, of 1.48 MT of CO_2 per acre per year for areas with complete vegetation removal. The maximum equivalent loss in carbon uptake for the BSPP would be about 8,806 MT of CO_2 per year, which would correspond to 0.004 MT of CO_2 per MWh generated. Compared to the CO_2 emissions that would be associated with the generation of fossil fuel in amounts comparable to energy to be supplied by the proposed action (fossil fuel energy generation-related GHG emissions can range from 0.35 to 1.0 MT of CO_2 per MWh depending on the fuel and technology), the natural carbon uptake loss caused by construction of the BSPP would be negligible.

Operation and Maintenance of the BSPP

Electricity generation GHG emissions are generally dominated by CO_2 emissions from the carbon-based fuels; other sources of GHG are typically small and also are more likely to be easily controlled or reused/recycled. For this solar project, the primary fuel (solar energy) is GHG-free; however, natural gas would be used in the two auxiliary boilers used for HTF freeze protection, and gasoline and diesel fuel would be used in the maintenance vehicles, offsite delivery vehicles, staff and employee vehicles, the four emergency fire water pump engines, and four emergency generator engines. Sulfur hexafluoride emissions also could result from electrical equipment leakage. Anticipated annual operations-related GHG emissions of the BSPP are shown in Table 4.3-2. All emissions are converted to CO_2-equivalent and totaled.

TABLE 4.3-2
BSPP OPERATING GREENHOUSE GAS EMISSIONS

	Annual CO2-Equivalent (MTCO2E)[a]
Auxiliary Boilers[b]	12,847
Emergency Generators b	289
Fire Pumps b	31
Maintenance Vehicles b	226
Delivery Vehicles b	164
Employee Vehicles b	1,208
Equipment Leakage (SF6)	24
Total Project GHG Emissions – MTCO2E b	**14,789**
Facility MWh per year	2,100,000
Facility GHG Emission Rate (MTCO2E/MWh)	0.0070

NOTES:
[a] One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.
[b] The vast majority of the CO2E emissions, over 99 percent, is CO2 from these emission sources.

SOURCE: Solar Millennium 2009a; AECOM 2010a, Attachment DR-Air-2 and DR-AIR-20; Galati & Blek 2010f; and employee vehicle emissions have been estimated by CEC staff.

The proposed action is estimated to emit, directly from primary and secondary emission sources nearly 17,700 metric tons of CO_2-equivalent GHG emissions per year. BSPP, as a renewable energy generation facility, is determined by rule to comply with the Greenhouse Gas Emission Performance Standard requirements of SB 1368 (Chapter 11, Greenhouse Gases Emission Performance Standard, Article 1, Section 2903 [b][1]). Regardless, BSPP has an estimated GHG emission rate of 0.0070 MTCO2E/MWh, which is well-below the Greenhouse Gas Emission Performance Standard of 0.500 MTCO2/MWh.

The beneficial energy and GHG impacts of the BSPP also could be measured in terms of the time required to produce an amount of energy as great as what was consumed during production, which, in the context of a solar power plant, includes all of the energy required during construction and operation. Within the realm of life cycle analysis, this amount of time is called the “energy payback

time." Tables 4.3-1 and 4.3-2 provide an estimate of the onsite construction and operation emissions, employee transportation emissions, and the final segment of offsite materials and consumables transportation. However, there are additional direct transportation and indirect manufacturing GHG emissions associated with the construction and operation of the proposed action, all of which are considered in the determination of the energy payback time. A document sponsored by Greenpeace estimates that the energy payback time for concentrating solar power plants, such as BSPP, to be on the order of five months (Greenpeace 2005, Page 9); the project life for BSPP is on the order of 30 years. Therefore, the proposed action's GHG emissions reduction potential from energy displacement would be substantial. The GHG displacement for the BSPP would be similar to, but not exactly the same as, the amount of energy produced after energy payback is achieved multiplied by the average GHG emissions per unit of energy displaced.[1]

Closure and Decommissioning of the BSPP

Closure and decommissioning-related activities would emit GHGs when the facility is dismantled and the site is restored. It is anticipated that such emissions would be caused by the operation of construction equipment and motor vehicles; related impacts would be a one-time, limited-duration event. BSPP-specific contributions to global climate change during the closure and decommissioning phase are evaluated using the same methods as initial construction emissions, and are anticipated to be comparable in type and magnitude, but likely to be lower than, the construction emissions as discussed above.

Mitigation Potential of the BSPP on Climate Change

As discussed previously, The BSPP would generate approximately 2,100,000 MWh of power per year, with a GHG emission rate of 0.004 MT of CO_2 per MWh. The power produced by the BSPP would offset power production by fossil-based power plants, which can range from 0.35 to 1.0 MT CO_2 per MWh, as discussed previously. The electric power produced from the BSPP would be imported onto California's power grid, and would be used preferentially to conventional fossil fuel based power generation, including natural gas combined cycle plants, natural gas single cycle peaking plants, and power imported from other states, which may include power from coal-fired plants. Therefore, the Project would provide a direct benefit to climate change – namely the offset of up to approximately 2,100,000 MWh/yr of carbon dioxide-emitting power derived from existing/conventional fossil fuel power plants. Additionally, assuming that reductions in demand for existing fossil power would reduce demands for the natural gas and coal feedstocks used for those power plants, some degree of offset of upstream carbon dioxide, methane, nitrous oxide, and other GHG emissions associated with natural gas and coal extraction and transport, will also be realized. Therefore, implementation of the Project will provide direct and indirect benefits that counter the potential effects of climate change. The Project supports and is part of a transition towards increased in-state, national, and global renewable power production, which is a key component towards the mitigation of climate change.

[1] The average GHG emissions for the displaced energy over the project life is not known, but currently fossil fuel fired power plants have GHG emissions that range from 0.35 MT/MWh CO2E for the most efficient combined cycle gas turbine power plants to over 1.0 MT/MWh for coal fired power plants.

4.3.3 Direct and Indirect Impacts of Climate Change on the Proposed Action

In addition to simple warming, climate change also is expected to result in a suite of additional potential changes that could affect the natural environment, in a manner that is relevant to the BSPP. The potential for climate change effects on the proposed action is discussed below.

Hydrologic Resource

In California and much of the U.S. West, climate change is expected to result in several potential effects related to water resources. These include potential sea level rise, potential changes in the frequency of flooding and droughts, and potential reductions in surface water supply.

Sea Level Rise

Sea level rise is expected to occur as a result of increased global temperatures. Increased global temperatures include increases in ocean temperature, as well as air temperature. As water temperature increases, the water contained in the world's oceans would undergo thermal expansion. Increased temperatures could also result in a net melting/reduction in the extent of polar ice sheets. These effects could result in an increase in the level of the world's oceans, and some degree of sea level increase has already been established over the last century. However, these potential effects are not expected to affect the BSPP, which would be located approximately 150 miles from the ocean, and at an elevation of at least 350 feet mean sea level (msl). The proposed action would not be affected by sea level rise.

Snowpack and Snowmelt Period

Changes in snowpack and snowmelt period are anticipated both in California and in the Colorado River watershed as a result of climate change. Specifically, climate change is expected to result in generally warmer temperatures, which, in turn, would result in a greater proportion of total annual precipitation falling as rain. Snowpack in California and the Colorado River watershed serves as a temporary means of water storage, wherein water is released slowly and into the early summer during snowmelt. If a greater proportion of precipitation falls as rain, the snowpack would be lessened, and the potential for water storage within the snowpack also would be lessened. Also, warmer temperatures would cause earlier snowmelt events, potentially reducing the ability of water managers to capture snow melt in reservoirs. However, there is no snowpack in the vicinity of the proposed action, and the BSPP is not dependent on snowmelt water for water supply. Therefore, the BSPP would not affect snowpack, and would not be deleteriously affected by potential changes in snowpack characteristics.

Dilution

Dilution refers to the amount of water that is available in a receiving water body into which wastewater is discharged. Under some circumstances, climate change could result in a change in the volume or timing of water flows that are available in stream for dilution of wastewater. However,

the BSPP would not discharge wastewater to surface waters (a septic system is included for on-site wastewater, and process water is controlled on site via an evaporation pond system). Therefore, potential climate-related changes in dilution capacity would not affect the proposed action.

Water Temperature

Water temperature can be critical to fisheries resources in parts of California, in particular, along those waterways that support cold water fisheries. However, the site and its vicinity do not contain any perennial surface waterways that could support fisheries. The BSPP would rely on groundwater for a water supply, and the temperature of the groundwater would not be critical to BSPP operation. Furthermore, the BSPP would not result in a water discharge or other activity that would affect water temperature along the Colorado River. No component of the BSPP would alter reservoir flows or otherwise change water management operations, such that water temperature would be altered. Therefore, potential changes in water temperature would not affect the BSPP, and no further discussion is warranted.

Flooding, Drainage, and Erosion

Climate change is anticipated to affect the frequency and intensity of extreme weather events, including large storm events and droughts, in western watersheds including the Colorado River watershed. Although the degree of change is a subject of substantial debate, most investigations concur that the Colorado River watershed, including the BSPP area, would experience an increase in the frequency and intensity of high rainfall/flood events. This could result in an increase in potential stormwater runoff and flooding, and an increase in erosion and sedimentation on site and downstream from the site. Increases in the intensity or frequency of droughts are discussed in terms of water resources availability, below.

As discussed in Section 4.19, *Water Resources*, the BSPP would include a series of engineered facilities, including rerouted drainage/flood channels, berms, and on-site drainage facilities that would channel, retain, and otherwise manage stormwater and flood flows on site and in the areas immediately surrounding the site. Also discussed in Section 4.19, the BSPP would be designed to account for stormwater drainage and flood flows, and Mitigation Measures WATER-10 through WATER-14 would require revisions to the BSPP's drainage report and plans, completion of a detailed FLO-2D analysis, and implementation of drainage channel design and channel erosion protection measures. These measures originally were drafted based on Conditions of Certification SOIL&WATER-11 through SOIL&WATER-14. However, the mitigation measures WATER-10, WATER-11, and WATER-13 have been updated to include assessment of potential climate change effects on water resources, and incorporation of BSPP design feature recommendations that would serve to offset potential drainage and flooding effects associated with climate change.

Water Resources Availability

As discussed in Section 3.20, *Water Resources*, and Section 4.19, *Impacts to Water Resources*, the site is located within the lower Colorado River watershed, and drainages on site are tributary to the Colorado River. Surface waters in the BSPP area and its immediate vicinity occur only

during substantial precipitation events, where surface runoff occurs. There are no perennial streams or other waterways located on site, and the BSPP would not rely on surface water for water supply during construction or operation. Instead, the BSPP would rely on groundwater for water supply during both construction and operation.

Estimates of the potential effects of climate change on the frequency and amount of rainfall in the west vary, however, most studies concur that in the desert southwest, some degree of reduction of precipitation would occur. Seager et al (2007) and Christensen et al (2004) completed extensive reviews and modeling of potential climate change effects on the Colorado River watershed and other southwestern watersheds, including several climate change scenarios. The authors conclude that precipitation and runoff within the watershed could generally decrease, while periods of drought could increase, resulting in an overall reduction in the availability of water along the Colorado River. These scenarios could result in moderate to substantial effects on water supply availability, and could affect the ability of water rights holders along the Colorado River to divert their full entitlements.

In the event that climate change results in reduced precipitation within the BSPP area and its vicinity, some degree of associated reduction in groundwater recharge from rainfall could occur. This situation would not result in increased water requirements by the proposed action, and would not result in additional groundwater pumping during project construction or operations. Additionally, as discussed in Sections 3.20 and 4.19, the rate of groundwater pumping for the Project would be minor in comparison to the total volume of groundwater contained in storage. Therefore, even with potential reductions in total precipitation volume associated with future climate change, the ability of the Project to meet its water needs would not be reduced, and no increase in pumping would be required as a result of the effects of climate change.

If climate change does result in reduced recharge to the underlying groundwater basin, the potential cumulative effects on groundwater levels identified in Section 4.19 could be exacerbated. Mitigation measures WATER-1 through WATER-5 and WATER-15 would offset these effects in part. However, as discussed in the cumulative effects analysis discussion of Section 4.19, the combined operation of all of the foreseeable projects will have an impact on groundwater levels, and this effect could be exacerbated by anticipated reductions in groundwater recharge due to climate change.

Biological Resources

Biological resources could be affected as a result of climate change in California. Distribution patterns of species are generally expected to shift according to regional changes in temperature and precipitation, while the location of wildlife migration corridors and the extent of invasive species also could be altered.

Fisheries

The BSPP does not contain any perennial or other surface waters that contain fisheries resources, and would not affect or be affected by changes in fisheries characteristics. Therefore, no further discussion is warranted.

Habitat Values of Mitigation Lands

As discussed in Section 4.17, *Impacts to Vegetation Resources*, and Section 4.21, *Impacts to Wildlife Resources*, implementation of the BSPP would require mitigation for biological resources values that would be lost as a result of implementation of the BSPP. As discussed in these sections, the proposed mitigation lands would be required to be equivalent in terms of habitat value, and at a replacement ratio of at least 1:1 (typically greater than 1:1, as specified in Sections 4.17 and 4.21) for direct impacts. Unfortunately, climate change could result in adverse effects on biological resources located on these mitigation lands. However, given that mitigation lands must be similar in biological resources value as compared to lost resources on site, it is anticipated that climate-related effects for the mitigation lands would be similar to those located at the BSPP site, if the BSPP were never built. Therefore, potential reductions in the biological resources values of mitigation land values resulting from climate change are expected to be similar to on-site conditions in the absence of the BSPP, and no further discussion is warranted.

Hazards

Heat related hazards, including potential increases in wildfire and heat waves, could be exacerbated by climate change.

Wildfire Risks

Potential risks associated with fire are discussed in Section 3.12, *Public Health and Safety*. Section 4.12, *Impacts to Public Health and Safety*, provides a discussion of potential fire-related risks, and also ensures that adequate fire control personnel, infrastructure, and associated planning would be completed and/or available to the BSPP, to ensure compliance with federal, state, and local regulations, and to ensure worker safety.

Climate change would result in a small but general increase in temperature, and could also result in an increase in the frequency of extreme weather events that could generate wildfires, such as increased frequency of drought and heat waves, during operation of the BSPP. In compliance with applicable regulations and mitigation proposed in Section 4.12, the Applicant would be required install a fire protection/control system on site in including a fire water supply system and associated infrastructure, and to comply with state and federal regulations regarding worker safety and training. Additionally, under Mitigation Measure WORKER SAFETY-7 (see Appendix G), the Applicant would be required to provide funding to the Riverside County Fire Department to ensure available resources to fight potential fires on site. Although the risk of wildfire that could affect the site could increase as a result of climate change, these potential increases in risk are expected to be offset by ongoing compliance with the worker safety and fire protection regulations and mitigation measures specified in Section 4.12. Therefore, no additional mitigation is warranted.

Heat Waves

The frequency of occurrence and the severity of heat waves could increase as a result of climate change. Heat waves could result in increased potential risk to BSPP employees. However, Mitigation Measure WORKER SAFETY-2 (see Appendix G) would require implementation of

an operation period heat stress protection plan that is based on and expands on Cal OSHA requirements. This plan would provide measures to protect workers against the effect of heat-related hazards, whether or not those hazards are caused by climate change. Although the frequency and/or intensity of heat wave events could increase as a result of future climate change, the heat stress protection plan would meet state requirements for worker safety. Therefore, no further discussion or mitigation is warranted.

Other Issues

In addition to the issues discussed above, potential climate change related impacts associated with soil moisture and fugitive dust concentrations also warrant discussion.

Soil Moisture

As discussed in Section 3.15, *Soil Resources*, and 4.14, *Impacts to Soil Resources*, almost all rainfall that occurs in this region of California is lost through evaporation and evapotranspiration, and soil moisture in the BSPP area and its vicinity is characteristically low. As discussed previously, although precise changes are impossible to predict, climate change could result in increases in extreme weather events, including droughts and heat waves, and an overall reduction in precipitation. These conditions could result in a concurrent reduction in soil moisture content at the site and regionally. However, reductions in soil moisture content would not affect BSPP-related operations, and would not require any change in water resources usage. Additionally, the proposed facilities would in no way support additional drying of soils on site, or otherwise exacerbate potential changes in soil moisture associated with climate change. Therefore, no additional change would occur, and no further discussion is warranted.

Fugitive Dust

As discussed in Section 3.2, *Air Resources*, and Section 4.2, *Impacts to Air Resources*, fugitive dust emissions would require mitigation during operation of the BSPP. Mitigation Measure AQ-SC7 (see Appendix G) would mitigate operation period fugitive dust emissions to ensure compliance with state and local regulations and requirements. Although climate change could result in some degree of reduction of soil moisture, as discussed above, soil moisture is already very low under current conditions. Any further reductions in soil moisture would be minimal in terms of the absolute amount of water contained in on-site soils. Therefore, any potential further reductions in soil moisture associated with climate change are not anticipated result in a substantial increase in fugitive dust emissions, and the proposed Mitigation Measure would be sufficient to meet federal, state, and local requirements regarding fugitive dust.

Direct and Indirect Impacts of BSPP Alternatives

Reconfigured Alternative

The Reconfigured Alternative essentially would require the same amount of total construction and have the same operation and maintenance-related emissions sources, and decommissioning requirements as the proposed action. Therefore, the GHG emissions from construction and

operation would be similar to those of the proposed action. See Tables 4.3-1 and 4.3-2. The Reconfigured Alternative would minimize the placement of facilities within state waters, and minimize potential impacts to desert dry wash woodlands. Other aspects of the Reconfigured Alternative would be similar to or the same as the proposed action.

If the Reconfigured Alternative were selected, the same direct GHG emission impacts of the proposed action and the same indirect benefits of the proposed action from displacing fossil fuel fired generation and reducing associated GHG emissions from gas-fired generation would occur. Potential impacts to desert dry wash woodlands and associated state waters would be minimized under the Reconfigured Alternative, as would requirements for mitigation lands. However, the Reconfigured Alternative would not alter the potential effects of climate change on mitigation lands or drainage and flooding. Additionally, all other potential climate change related impacts would be the same as for the proposed action.

Reduced Acreage Alternative:

The Reduced Acreage Alternative essentially would reduce the total construction-, operation- and decommissioning-related GHG emissions of the proposed action by 25 percent because of the elimination of one of the four power blocks. Therefore, the total GHG emissions could be determined by multiplying the proposed action's GHG emissions provided in Tables 4.3-1 and 4.3-2 by 0.75. The benefits of the proposed action in displacing fossil fuel fired generation and reducing associated GHG emissions from gas-fired generation would be slightly reduced. The extent of effects to biological resources and hydrologic resources would also be reduced, due to the reduced intensity of construction activities and reduced water requirements. However, the Reduced Acreage Alternative would not alter the potential effects of climate change on mitigation lands, drainage and flooding, or water resources availability. All other potential climate change related impacts would be the same as for the proposed action.

If the Reduced Acreage Alternative were selected, other renewable projects could be developed that would compensate for the loss of generation compared to the proposed action on other sites in the Riverside County, the Colorado Desert, or in adjacent states as developers strive to provide renewable power that complies with utility requirements and Federal and state mandates.

No Action Alternative A

None of the anticipated impacts, beneficial or adverse, of the proposed action would occur. Instead, the land on which the BSPP is proposed would become available to other uses consistent with BLM's land use plan, potentially including another renewable energy project.

If the proposed action is not approved, renewable projects would likely be developed on other sites in Riverside County, the Colorado Desert, or in adjacent states as developers strive to provide renewable power that complies with utility requirements and Federal and state mandates. In terms of potential impacts due to climate change, under No Action Alternative A, the proposed action would not be implemented, and, therefore, would not be affected by climate change. However, renewable projects developed on other sites in Riverside County, the Colorado Desert,

or in adjacent sites would likely be subject to similar climate change effects as compared to the proposed action.

No Action Alternative B

Because the CDCA Plan would be amended under this alternative to make the site unavailable for future solar development, it is expected that the site would remain in its existing condition, with no new structures or facilities constructed or operated on the site. As a result, GHG emissions associated with the development of renewable energy projects would occur elsewhere and the carbon uptake potential of the site would not be expected to change noticeably from existing conditions. Consequently, this No Project/No Action Alternative would not result in GHG benefits on this site, but could occur in connection with other renewable energy projects developed elsewhere to meet State and Federal mandates. Such projects would likely have similar impacts on climate change as the proposed action, and climate change related impacts would likely affect such projects similarly to the proposed action, although in other locations.

No Action Alternative C

Because the CDCA would be amended under this alternative, it is possible that the site would be developed with the same or a different solar technology. As a result, GHG emissions and carbon sequestration potential similar to that of the proposed action could result. Different solar technologies require different amounts of construction and operations maintenance, and different volumes of water during operations; however, it is expected that all the technologies would provide the more significant benefit, like the proposed action, of displacing fossil fuel fired generation and reducing associated GHG emissions. As such, No Action Alternative C could result in GHG benefits similar to those of the proposed action. In terms of potential climate change impacts on No Action Alternative C, these impacts would likely be similar to the proposed action, although metrics related to project size and water use could vary somewhat based on the selected power generation technology.

4.3.4 Summary of BSPP-Specific Mitigation Measures

The implementation of mitigation measures imposed by the Energy Commission as Conditions of Certification for the BSPP also would avoid or reduce impacts on the quality of the human environment. These mitigation measures are set forth in Appendix G. The following mitigation measures would avoid or minimize impacts on global climate change:

AQ-SC5, AQ-SC6

AQ-1, AQ-2, AQ-3, AQ-4, AQ-5, AQ-6, AQ-7, AQ-9, AQ-10, AQ-11, AQ-12, AQ-13, AQ-14, AQ-15. AQ-16, AQ-17, AQ-19, AQ-20, AQ-21, AQ-22, AQ-23, AQ-24, AQ-25, AQ-26, AQ-27, AQ-33, AQ-34, AQ-39, AQ-40, AQ-41, AQ-42, AQ-43, AQ-44, AQ-45, AQ-46, AQ-47, AQ-48, AQ-49, AQ-50, AQ-51, AQ-52, AQ-53, AQ-54, AQ-55, AQ-56, AQ-57, AQ-58, AQ-59, AQ-60, AQ-61, AQ-62, AQ-63, AQ-64

The following mitigation measures would avoid or minimize potential impacts of global climate change on the proposed action:

AQ-SC7

WATER-1, WATER-2, WATER-3, WATER-4, WATER-5, WATER-10, WATER-11, WATER-12, WATER-13, WATER-14, WATER-15

WORKER SAFETY-2, WORKER SAFETY-7

4.3.5 Residual Incremental, BSPP-specific Impacts after Mitigation Measures Were Implemented

The residual GHGs emitted from construction were estimated to be 103,900 metric tons of C CO2 equivalent for construction and 14,789 metric tons/year CO2 equivalent for a total of 443,670 tons CO2 equivalent over the life of the BSPP.

4.3.6 GHG Emissions Associated with Past, Present and Reasonably Foreseeable Future Actions

GHG Emissions from Past, Present and Reasonably Foreseeable Actions

As stated above, human activities are widely-recognized as being primarily responsible for the changing (warming) global climate. Such activities result in emissions of carbon dioxide and other GHGs from industrial processes, fossil fuel combustion, and changes in land use, such as deforestation. For example, in 1990, industrial processes and electric power generation caused the majority of human-generated global GHG emissions, contributing 32 percent and 20 percent, respectively (Pew, 2010). Within the United States, which emitted over seven billion metric tons of CO2E in 2004; in that year, industry emitted 30 percent of the total, transportation emitted 28 percent, the commercial sector emitted 17 percent, the residential sector emitted 17 percent, and agriculture emitted 8 percent (Pew, 2010a). Industrial processes, power generation, land use changes and other actions contributing to climate change are expected to continue in the foreseeable future, subject to increasingly stringent requirements.

The proposed BSPP and other present and reasonably foreseeable future actions, including those identified in Section 4.1, would contribute construction-, operation and maintenance-, and closure and decommissioning-related GHG emissions impacts and benefits in the existing international, national, State-wide and regional context. Internationally, this context includes, among many other efforts, the Bali Roadmap, which was adopted in 2007 to launch negotiations toward a new global climate agreement; and the Copenhagen Accord, which was reached at the 2009 U.N. Climate Change Conference and provides for explicit national GHG emissions reduction pledges. The international context also includes urbanization by developing countries, deforestation and development-related conversion of agricultural lands.

The national context includes GHG-related activity by all branches of government, including the GHG Emissions Reduction Target for Federal Operations set by President Obama in January 2010; proposed legislation including the American Clean Energy and Security Act of 2009 (H.R.2454), the Clean Energy Jobs and American Power Act of 2009 (S.1733), and the American Clean Energy Leadership Act of 2009 (S.1462); and attention to climate change issues by the nation's highest court. *Massachusetts et al. v. Environmental Protection Agency*, 549 U.S. 497 (2007).

Recent State-level GHG-related actions include the California Air Resources Board's February 25, 2010, adoption of a regulation to limit and monitor sulfur hexafluoride (SF6) emissions from electric power sector equipment; the California Building Standards Commission's January 14, 2010, approval of the most environmentally stringent building code in the United States, which will go into effect in January 2011 and which the California Air Resources Board (CARB) anticipates will reduce GHG emissions by 3 million metric tons in 2020; and CARB's September 24, 2009, adoption of a revised Forest Project Protocol that allows private landowners, public lands, and out-of-state projects to participate in the State's voluntary forestry offsets market – it is the first state-approved carbon accounting standard that is applicable to projects nationwide. Additionally, the adoption of Senate Bill 375 (SB 375) in 2008 enhances California's ability to reach its AB 32 goals by providing regional planning-related GHG emissions-reduction goals.

Regionally, based on SB 375, the Southern California Association of Governments' six-county area (including Riverside, San Bernardino, Orange, Los Angeles, Imperial and Ventura counties) must reduce its annual GHG emissions by 2.5 million metric tons by 2020. Local governments are considering GHG and related emissions reductions in their planning efforts. For example, the Riverside County Transportation Demand Management Program (Riverside County Code Ch. 10.36) is intended in part to reduce motor vehicle emissions, which include GHGs. In turn, San Bernardino County, which has been a focal point in conflicts over local climate regulation, has updated its General Plan and otherwise incorporates GHG emissions reduction considerations into its local planning decision-making process (OPR, 2010).

Overall, it is expected that the BSPP would enhance the attainment of international, national, Statewide and regional GHG reduction efforts.

Environmental Consequences of Climate Change

Beneficial and adverse impacts of GHG emissions caused by the proposed action, together with GHG emissions-related impacts of past, present and reasonably foreseeable future actions, would contribute to cumulative global climate change impacts on the various elements of human society and the environment that are sensitive to climate variability. For example, human health, agriculture, natural ecosystems, coastal areas, and heating and cooling requirements are examples of climate-sensitive systems. Globally, rising average temperatures are believed to have caused glaciers to shrink, permafrost to thaw, ice on rivers and lakes to freeze later and break up earlier, growing seasons to lengthen, and animal and wildlife ranges to shift. In North America, warming in western mountains is expected to cause decreased snowpack, more winter flooding, and reduced summer flows, thereby exacerbating competition for over-allocated water resources.

Extended periods of high fire risk and large increases in areas burned – each a risk of global warming – would increase impacts on forests from pests, diseases and wildfire. Areas that currently experience periods of extreme heat are expected to be further challenged by an increased number, intensity and duration of heat waves during the course of the century, with potential for adverse health impacts particularly for elderly populations. (IPCC, 2007). For a review of how climate change could affect the proposed action and alternatives, please see the previous subsection, "Direct and Indirect Impacts of Climate Change on the Proposed Action."

Mitigation Measures to Reduce Impacts on Global Climate Change

As stated above, implementation of mitigation measures imposed by the BLM under this FEIS and the Energy Commission as Conditions of Certification for the BSPP also would avoid or reduce incremental, BSPP-specific impacts on the quality of the human environment. These mitigation measures are set forth in the FEIS, Appendix G, and are summarized above. Additionally, it is expected that each of the projects that comprise the cumulative scenario, other federal projects, and other projects within the State of California would likely be subject to similar types of mitigation measures to address contributions to climate change impacts. Additional voluntary and obligatory measures could apply to projects at the local or international level.

4.4 Impacts on Cultural Resources

4.4.1 Impact Assessment Methodology

The basic regulatory process for assessing impacts on cultural resources consists of the following five steps:

1. Determining the appropriate geographic extent of the analysis for the proposed action and for each alternative action under consideration;

2. Identifying cultural resources within each such geographic area;

3. Determining the historical significance of the cultural resources in the inventory for each geographic area, unless the construction, operation and maintenance, and decommissioning and closure of the proposed or alternative actions will avoid particular resources;

4. Assessing the character and the severity of the effects of the proposed and alternative actions on the historically significant cultural resources in each respective inventory that cannot be avoided; and

5. Developing measures that would resolve those effects that are found to be significant.

Further details of each of these phases follow below and help provide the parameters of the present analysis.

The Area of Potential Effects

The regulations implementing Section 106 of the NHPA define the Area of Potential Effects (APE) as the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if such properties exist. The APE is influenced by the scale and nature of the undertaking and may be different for different kinds of effects caused by the undertaking (36 CFR 800.16(d)). In addition, the APE may be buffered for purposes of cultural resources inventory to facilitate the identification of resources that may be located in proximity to the APE and indirectly affected by a proposed project or to allow for redesign of project components to avoid direct effects to cultural resources. For purposes of complying with Section 106, the APE for the BSPP generally consists of the following:

1. For archaeological resources, the APE is defined as the area included within the right-of-way grant for the solar energy generating plant and associated facilities, roads, and transmission lines. For proposed linear facilities routes, the right-of-way was buffered to 50 feet to either side of the rights-of way to establish the survey corridor for these routes.

2. For ethnographic and built-environment resources, the APEs are the proposed footprints (plant site and linear facilities corridor) plus a 0.5-mile buffer from the plant site, and from any above-ground linear facilities, to take into consideration resources whose settings could be adversely affected by industrial development.

Assessing Effects

The core of a cultural resources analysis under NEPA and Section 106 is the assessment of the character of the effects that a proposed or alternative action may have on historically significant cultural resources. The analysis takes into account direct, indirect, and cumulative effects.

In accordance with 36 CFR Section 800.5 of the ACHP's implementing regulations, which describes criteria for adverse effects, impacts on cultural resources are considered significant if one or more of the following conditions would result from implementation of the proposed action:

1. An undertaking has an effect on a historic property when the undertaking may alter characteristics of the property that may qualify the property for inclusion in the National Register of Historic Places (NRHP). For the purpose of determining the type of effect, alteration to features of a property's location, setting, or use may be relevant, depending on the property's significant characteristics, and should be considered.

2. An undertaking is considered to have an adverse effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties include, but are not limited to:

    a. Physical destruction, damage, or alteration of all or part of the property
    b. Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the NRHP
    c. Introduction of visual, audible, or atmospheric elements that are out of character with the property or that alter its setting
    d. Neglect of the property, resulting in its deterioration or destruction
    e. Transfer, lease, or sale of the property

Consideration is given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative. A formal effect finding under Section 106 relates to the proposed or alternative action as a whole rather than relating to individual resources.

4.4.2 Discussion of Direct and Indirect Impacts

Proposed Action

Direct and indirect effects are those that are more clearly and immediately attributable to the implementation of proposed or alternative actions. Direct effects are those "which are caused by the [proposed or alternative] action and [which] occur at the same time and place" (40 CFR 1508.8(a)). Indirect effects are those "which are caused by the [proposed or alternative] action and are later in time or farther removed in distance, but are still reasonably foreseeable" (40 CFR 1508.8(b)).

The Section 106 regulations narrow the range of direct effects and broaden the range of indirect effects relative to the definitions of the same terms under NEPA. The regulatory definition of "effect," pursuant to 36 CFR Section 800.16(i), is that the term "means alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register." In practice, a "direct effect" under Section 106 is limited to the direct physical disturbance of a historic property. Effects that are immediate but not physical in character, such as visual intrusion, and reasonably foreseeable effects that may occur at some point subsequent to the implementation of the proposed undertaking are referred to in the Section 106 process as "indirect effects."

Ground-disturbing construction activities associated with the BSPP could directly impact cultural resources by damaging and displacing artifacts, diminishing site integrity and altering the characteristics that make the resources significant. In addition, in the case of historic architectural resources and places of traditional cultural importance, impacts could occur to the setting of a resource even if the resource is not physically damaged.

Based on graphical representations showing the anticipated disturbance below ground and the anticipated above-ground intrusion into the flat landscape (Solar Millennium 2009b, figs. DR-CR-120a and b), impacts associated with the BSPP potentially affecting cultural resources include:

1. General cutting and filling would disturb the overall BSPP plant site to a maximum depth of seven feet.

2. In the solar array fields, BSPP collector foundation excavations would cause ground disturbance down to a maximum depth of 16 feet, and the collectors would intrude into the flat landscape to a maximum height of 24 feet.

3. In the power blocks, BSPP equipment foundation excavations would cause ground disturbance down to a maximum depth of seven feet, and the equipment would intrude into the flat landscape to a maximum height of 80 feet.

4. Along the linear facilities corridor, BSPP natural gas pipeline trench excavations would cause ground disturbance down to a maximum depth of 10 feet, and the transmission line supports would create an intrusion into the flat landscape to a maximum height of 140 feet.

Based on this information, archaeological resources consisting of a total of 210 known sites (30 prehistoric and 180 historic), and possibly additional resources yet to be discovered during construction, located within the full extent of the proposed action's below-grade impacts (inclusive of foundations and trenches) and above-grade impacts (inclusive of above-ground facilities), would be adversely affected by the BSPP. The integrity of setting and integrity of feeling of the two known built-environment resources located within this area would also be adversely affected by the BSPP.

No additional impacts to cultural resources are anticipated from BSPP operation or from BSPP closure and decommissioning.

4.4.3 Differences Among Alternatives

Reconfigured Alternative

This alternative includes Units 1, 2, and 4 as proposed for the BSPP as well as a relocated Unit 3. The setting for Units 1, 2, and 4 would not change from that for the proposed action. Relocated Unit 3 would be located partially on land that was previously surveyed for cultural resources in connection with the proposed action, but 480 acres of BLM-managed land for Unit 3 has not been surveyed for cultural resources. Consequently, at this time, how many and what kinds of additional cultural resources the Reconfigured Alternative would impact, beyond those already identified for the proposed action have not been identified.

The record search and field survey for the proposed BSPP identified 210 sites. Of those, 20 would be within Unit 1, 38 would be within Unit 2, 22 would be located within Unit 4, and 9 would be within the previously surveyed part of the relocated Unit 3. The additional field survey of the previously unsurveyed 480 acres of the Reconfigured Alternative identified 77 new sites. So the cultural resources inventory for the Reconfigured Alternative would therefore total 166 archaeological sites.

Reduced Acreage Alternative

The Reduced Acreage Alternative would essentially be Units 1, 2, and 4 of the proposed action and would be a 750-MW solar facility located entirely within the boundaries of the proposed action. It would eliminate the southwestern 250-MW solar field (1,200 acres), consisting of about 25 percent of the proposed action area. As a result, the environmental setting consists of the northern and eastern portions of the proposed action, as well as the area affected by the linear facilities corridor. This alternative would be located entirely within the previously evaluated APE boundaries.

The record search and field survey for the proposed BSPP identified 210 sites. With the elimination of the 38 sites that are within the proposed action's Unit 3, the cultural resources inventory for the Reduced Acreage Alternative would be reduced to a total of 178 archaeological sites.

No Action Alternative A

Under this alternative, the proposed BSPP would not be approved by the BLM, and BLM would not amend the CDCA Plan. As a result, no solar energy project would be constructed on the proposed site, and BLM would continue to manage the site in a manner consistent with the existing land use designation in the CDCA Land Use Plan of 1980, as amended.

Because the CDCA Plan would not be amended and no solar project approved for the site under this alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site and no new ground disturbance. As a result, no loss or degradations to cultural resources from construction or operation of the

proposed action would occur. However, the land on which the BSPP is proposed would become available to other uses that are consistent with BLM's land use plan, including another solar project requiring a land use plan amendment.

No Action Alternative B

Under this alternative, the proposed BSPP would not be approved by the BLM and the BLM would amend the CDCA Plan to make the proposed site unavailable for future solar development. As a result, no solar energy project would be constructed on the site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Land Use Plan of 1980, as amended.

Because the proposed BSPP would not be approved, and the CDCA Plan would be amended to make the area unavailable for future solar development, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site. As a result, the condition of the site is not expected to change noticeably from the existing condition and, as such, No Action Alternative B would not result in impacts to cultural resources.

No Action Alternative C

Under this alternative, the proposed BSPP would not be approved by the BLM and BLM would amend the CDCA Land Use Plan of 1980, as amended, to allow for other solar projects on the site. As a result, it is possible that another solar energy project could be constructed on the site.

Because the CDCA Plan would be amended, it is possible that the site would be developed with the same or a different solar technology. As a result, impacts on cultural resources would result from the construction and operation of the solar technology and would likely be similar to the impacts from the proposed action. Different solar technologies require different amounts of grading and maintenance; however, it is expected that all the technologies would require some grading and maintenance. As such, No Action Alternative C could result in impacts on cultural resources similar to the impacts under the proposed action.

4.4.4 Discussion of Cumulative Impacts

The regulations implementing Section 106 of the NHPA contemplate close coordination between the NEPA and NHPA processes (36 CFR 800.8), and expressly integrate consideration of cumulative concerns within the analysis of a proposed action's potential direct and indirect effects by defining "adverse effect" to include "reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative" (36 CFR 800.5(a)(1)). Consequently, the geographic scope of the cumulative effects analysis could be limited to the area defined above. However, to provide for a more conservative cumulative analysis, the cumulative analysis impact area for cultural resources is broader, and includes the cultural sites, traditional use areas, and cultural landscapes on the site and in the general vicinity of the site, including along the I-10 corridor. The proposed action could cause

impacts on cultural resources during the proposed 69-month construction period or as a result of operation and maintenance or closure and decommissioning activities. Right-of-way (ROW) applications have been submitted for projects encompassing approximately 100,000 acres along the I-10 corridor, although the projects themselves will affect considerably less acreage. Almost all of these projects are on BLM or other federal land and, for this reason, are or would be subject to NEPA and the NHPA, which contain cultural resource-protective requirements related to investigations, impact assessment, avoidance and mitigation. It is anticipated that projects in the general vicinity of the site that are not on Federal land would be subject to CEQA; therefore, any related impacts on cultural resources would be subject to cultural-resource-protective requirements based on State law to avoid or minimize such impacts. Nonetheless, even with project-specific impacts on cultural resources avoided or minimized, historic properties on a substantial amount of land still would be affected. Cumulative impacts would vary by alternative only to the degree to which direct and indirect impacts would vary by alternative.

4.4.5 Summary of Mitigation Measures

Adverse effects that the proposed or alternative actions may have on cultural resources will be resolved through compliance with the terms of the BLM's Programmatic Agreement (PA) under Section 106. Analysis of impacts in this document and implementation of the terms of the PA would evidence BLM's compliance with Section 106 and NEPA.

In accordance with 36 CFR Section 800.14(b), PAs are used for the resolution of adverse effects for complex project situations and when effects on historic properties, resources eligible for or listed in the NRHP cannot be fully determined prior to approval of an undertaking. The BLM is currently preparing a PA in consultation with the State Historic Preservation Officer, Indian tribes, and other interested parties. The PA would govern the conclusion of the identification and evaluation of historic properties (eligible for the NRHP), as well as the resolution of any adverse effects that may result from the proposed or alternative actions. See Appendix D for the Draft PA.

Treatment plans regarding historic properties that cannot be avoided by proposed construction would be developed in consultation with stakeholders as stipulated in the PA. When the PA is executed and fully implemented, the BSPP would have fulfilled the requirements of NEPA and Section 106 of the NHPA. The PA would be executed prior to BLM's approval of the Record of Decision for the ROW grant for the action.

To mitigate impacts to significant cultural resources, the mitigation measures imposed by the Energy Commission as Conditions of certification for the BSPP also would avoid or reduce impacts on the quality of the human environment. These mitigation measures are set forth in Appendix G. To the extent that the following mitigation measures are consistent with the PA developed by the BLM to comply with Section 106 of the NHPA, they also would be implemented to avoid or minimize impacts pursuant to NEPA:

To mitigate impacts to significant cultural resources, per CUL-19 from the Energy Commission's Conditions of Certification, to the extent the following mitigation measures imposed by the CEC for the BSPP are consistent with BLM's Programmatic Agreement developed to comply with

Section 106 of the NHPA, they would avoid or reduce impacts on the quality of the human environment. These mitigation measures are set forth in Appendix G as follows:

> CUL-1, CUL-2, CUL-3, CUL-4, CUL-5, CUL-6, CUL-7, CUL-8, CUL-9, CUL-10, CUL-11, CUL-12, CUL-13, CUL-14, CUL-15, CUL-16, CUL-17, CUL-18, CUL-19

The BLM would also require the following mitigation measures be implemented to the extent they are consistent with BLM's Programmatic Agreement:

> **BLM-CUL-1:** The Applicant shall contribute to a program to document three cultural landscapes described in Chapter 3.4 that will, in part, be impacted by the BSPP. These areas: (1) a Prehistoric Trails Network Cultural Landscape (PTNCL), (2) a Desert Training Center California-Arizona Maneuver Area Cultural Landscape (DTCCL), and (3) a Prehistoric Quarries Archaeological District (PQAD). The Applicant will follow the documentation program by contributing to the preparation of National Register of Historic Places (NRHP) nominations for the PTNCL, DTCCL and PQAD if the BLM determines, after reviewing the documentation, that they are eligible for the NRHP.
>
> **BLM-CUL-2:** If significant or potentially significant cultural resources cannot be avoided, the Applicant will retain a qualified Cultural Resources Specialist to prepare and implement a Historic Property Treatment Plan (HPTP) for the affected resources. The HPTP may include protocols for affected resources including data recovery, research design, and treatment measures. The Principal Investigator for the HPTP program will meet the minimum Principal Investigator qualifications under the Secretary of Interior’s Standards for Archaeology.
>
> **BLM-CUL-3:** A designated Cultural Resources Specialist will provide input to construction and operation training programs for employees to enhance awareness regarding the protection of cultural resources. The designated specialist or a qualified cultural resources monitor will be available during construction to inspect and evaluate any finds of potentially significant buried cultural material. The Cultural Resources Specialist will coordinate with the Applicant’s construction manager and environmental compliance manager to stop all work in the vicinity of the find until it can be assessed. The Cultural Resources Specialist will also contact the BLM. If the discovery is determined to be not significant through consultation with the BLM, work will be allowed to continue.
>
> **BLM-CUL-4:** All discoveries will be documented on Department of Parks and Recreation forms (Form DPR 523) and filed with the California Historical Resources Information System (CHRIS) Eastern Information Center housed at the University of California, Riverside.
>
> **BLM-CUL-5:** If, in consultation with the BLM, a discovery is determined to be significant, a mitigation plan will be prepared and carried out in accordance with the Programmatic Agreement. If the resources cannot be avoided, a data recovery plan will be developed to ensure collection of sufficient information to address archaeological or historical research questions.
>
> **BLM-CUL-6:** A professional technical report will be prepared documenting assessment and data recovery investigations. The report will describe the methods and materials collected and will provide conclusions regarding the results of the investigations. The report will be submitted to the curatorial facility housing the collected archaeological

materials, as well as the appropriate California Historical Resources Information System center and BLM Palm Springs-South Coast Field Office.

BLM-CUL-7: Cultural material collected as part of an assessment or data recovery mitigation will be curated at a qualified curation facility. Field notes and other pertinent materials will be curated along with the archaeological collection. Curation costs shall be the responsibility of the Applicant.

BLM-CUL-8: If human remains are encountered during construction, potentially destructive activities in the vicinity of the find will be stopped. The Cultural Resources Specialist will immediately notify the Principal Investigator, who will contact the BLM. The Applicant will ensure that any such remains are treated in a respectful manner and that applicable state and federal laws are followed. If human remains of Native American origin, associated funerary objects, sacred objects or objects of cultural patrimony are discovered on federal land, the provisions of the Native American Graves Protection and Repatriation Act will be followed.

BLM-CUL-9: The Applicant will provide worker environmental awareness program (WEAP) training during construction to assist in worker compliance with cultural resource protection procedures. The training will include photographs of a variety of historic and prehistoric artifacts and will include a description of the specific steps to be taken in the event of an unanticipated discovery of cultural material, including human remains.

4.4.6 Residual Impacts after Mitigation Measures were Implemented

Residual impacts on cultural resources would exist after mitigation measures were implemented. Cultural resources damaged or destroyed by construction of the proposed action, even if subjected to mitigation, would be permanently lost from the archaeological record. This would make the cultural resources unavailable for future study to address future research needs when more advanced investigative techniques and methods of analysis might be available.

4.4.7 Unavoidable Adverse Impacts

The ground disturbance that would occur from the BSPP would result in unavoidable adverse impacts on cultural resources through damage and displacement of artifacts, loss of integrity of cultural resources, and changes in the settings of cultural resources inconsistent with their historic or traditional cultural values.

4.5 Impacts on Environmental Justice

4.5.1 Impact Assessment Methodology

In considering environmental justice in energy siting cases, this PA/FEIS uses a demographic screening analysis to determine whether a low-income and/or minority population exists within the potentially affected area. The potentially affected area consists of a six-mile radius beyond the site boundary and is consistent with air quality modeling of the range of a proposed action's air quality impacts.

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," directs Federal agencies to assess whether their actions have disproportionately high and adverse human health or environmental effects on minority and low-income populations. The Presidential memorandum accompanying the executive order states that "each Federal agency shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by NEPA." The demographic screening to determine the presence of minority and low income populations is based on information contained in two documents: *Environmental Justice: Guidance Under the National Environmental Policy Act* (Council on Environmental Quality, December, 1997) and *Guidance for Incorporating Environmental Justice Concerns in EPA's Compliance Analyses* (U.S. Environmental Protection Agency, April, 1998). The screening process relies on Year 2000 U.S. Census data to determine the presence of minority and below-poverty-level populations.

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

The environmental justice analysis has reviewed the findings and analysis for the following 11 sections in the PA/FEIS: Air Quality, Hazardous Materials, Land Use, Noise, Public Health, Social and Economics, Soils and Water, Traffic and Transportation, Transmission Line Safety/Nuisance, Visual Resources, and Waste Management. In its review of each PA/FEIS section, the environmental justice analysis considered potential impacts and mitigation measures, significance, and whether there would result in a disproportionately high and adverse impact on an environmental justice population.

4.5.2 Discussion of Direct and Indirect Impacts

Proposed Action

The minority population within both Census Block 458.00.6 and the City of Blythe as the whole are more than 50 percent and therefore both represent a community of concern for the purpose of environmental justice analysis. Census Block 458.00.6 also has a proportion of low-income residents living below the poverty level (28.3 percent), which is nearly twice that for Riverside

County as a whole. Consequently, it is conservatively judged that the Census Block Group 458.00.6 is also identified as a low income population that represents a community of concern for the environmental justice analysis.

In the context of the siting of a fossil-fired power plant, the primary environmental justice issues typically would be potential air or water issues that could adversely affect the health of nearby populations. Other issues could be any potential residential or business displacements, and noise impacts on populations near the power plant or ancillary facilities.

The BSPP would not result in significant air quality impacts or impacts to surrounding communities from emissions of toxic air contaminants. The proposed action would not involve wastewater discharges that could affect drinking water supplies or other water bodies. As a result of the proposed design, mitigation measures, and the absence of sensitive receptors nearby, there would be no significant noise impacts. The proposed action would not displace any homes or businesses. For these reasons, the rural and remote character of the area, and the low population concentration near the site, the BSPP would not result in disproportionate adverse impacts on low-income and minority populations. Therefore, no environmental justice impacts would be associated with the proposed action.

Alternatives

Under all three action alternatives (proposed action, Reconfigured Alternative and Reduced Acreage Alternative), the only difference with regard to direct and indirect impacts would be directly related to the total acreage of land disturbed within the site under each action alternative. Generally, resource impacts relating to any potential environmental justice impacts would be decreases based on the reduced acreage of the parcels for the reduced acreage alternatives. Therefore, no environmental justice impacts would be associated with the reduced acreage alternatives.

No Action Alternative A

No impacts on environmental justice would occur since the BSPP would not be constructed and operated.

No Action Alternative B

No impacts on environmental justice would occur since the BSPP would not be constructed and operated. Furthermore, no impacts could occur from future solar development; however, impacts on environmental justice could result from the development of other renewable energy projects (i.e., wind) or other uses allowable under Multiple Use Class L.

No Action Alternative C

No impacts on environmental justice would occur since the BSPP would not be constructed and operated. Future impacts would be possible should another application be received. Any impacts

would be analyzed as a part of the permitting process. Impacts could be comparable to, greater or less than dependent on the nature and intensity of the proposed use.

4.5.3 Discussion of Cumulative Impacts

No direct or indirect environmental justice impacts are expected to be associated with the proposed action and alternatives. Therefore, since there would be no direct or indirect environmental justice impacts, no cumulative environmental justice impacts would result.

4.5.4 Summary of Mitigation Measures

Given the absence of environmental justice impacts, no environmental justice mitigation measures are proposed.

4.5.5 Residual Impacts after Mitigation Measures were Implemented

No residual environmental justice impacts would occur.

4.5.6 Unavoidable Adverse Impacts

No unavoidable adverse environmental justice impacts would occur.

4.6 Impacts on Lands and Realty

4.6.1 Impact Assessment Methodology

The BLM Master Title Plats (MTPs) and Land & Mineral Legacy Rehost 2000 System (LR2000), which is an automated record system, were reviewed to obtain information related to pending and authorized uses on the lands potentially affected by the BSPP and its ancillary facilities. See Figure 43. The BLM Washington Office and California State Office web sites provided additional information relating to corridor designations and solar study areas potentially affected by the proposed BSPP.

Impact assessment is based on known impacts relative to construction, operation, maintenance and decommissioning of rights-of-way and land use permits of all types on BLM-administered land.

4.6.2 Discussion of Direct and Indirect Impacts

Proposed Action

Although there are numerous existing rights-of-way (ROWs) of record within and adjacent to the designated corridors, only a few would be affected by the BSPP. Any existing authorization that would be affected by the BSPP has “standing” in the sense that any new authorization(s) would be issued “subject to” the rights of the existing ROW holders. Therefore, the Applicant would be required to mitigate any potential impact to the existing users at Applicant’s expense. This would mean bearing all costs for relocating or modifying any facilities such as power poles or conductor that might necessary to accommodate the new use and by boring beneath any existing buried facilities to avoid impacts. This priority right attaches when a ROW is granted; subsequent grants of ROW would be issued subject to the rights of prior grants. Here, if and after the proposed ROW is granted for the BSPP, subsequent applicants would have to mitigate any impact of their proposals to the BSPP.

The fiber optic cable would either be attached to the gen-tie line or buried in a shallow trench along the same alignment as the road and gen-tie and gas lines and would either cross over or bore under any existing authorized use.

Impacts to Designated Corridors

Potential impacts to the designated corridors could occur as a result of the overhead gen-tie power line and underground pipeline crossing the corridors on a nearly perpendicular alignment rather than following along the corridor path. Impacts to the corridors from the fiber optic line would be the same as either the power line or gas pipeline, depending on whether the cable is strung on the gen-tie line or buried in a shallow ditch. However, with today’s technology, the impacts would be expected to be minimal, easily mitigated and would not preclude continued and future use of either designated corridor. Future use would be slightly constrained by placement of additional facilities within the corridors.

Impacts from the access road exiting the frontage road and heading north to the BSPP would be minimal because future transmission lines, both gas and electric, could easily bore under or span across the road, respectively. Future use would be slightly constrained by placement of additional facilities within the corridors.

Impacts to Interstate 10

Potential impacts to Interstate 10 from the overhead gen-tie line (and fiber optic cable if strung on gen-tie line) would be mitigated by abiding by the requirements of the California Department of Transportation (CalTrans) and industry standards (SOPs) and best management practices (BMPs) for crossing highways. Potential impacts to I-10 from the underground pipeline (and fiber optic cable, if buried) would also be mitigated by implementing the requirements of the Federal Highway Administration (FHA), CalTrans and SOPs and BMPs for crossing under highways.

Impacts to Other Authorized Uses

There would be no impacts to existing uses from the proposed solar generating facility.

As proposed, the gen-tie line would cross multiple existing uses both north and south of I-10. Once across the highway, the line would turn to the west and parallel the highway and existing power lines to the point of interconnection with the planned Colorado River substation.

The gas pipeline, as proposed, would connect directly into an existing east-west running Southern California Gas (SCG) gas pipeline causing a direct impact. The pipeline could indirectly impact other buried utilities that the pipeline would cross north and south of I-10. However, the pipeline would follow SOPs and BMPs for connection of one gas line to another and would be buried at a depth that would avoid all existing buried gas lines, therefore mitigating potential negative impacts to existing authorized users.

Potential impacts from the fiber optic cable would be the same as either the overhead power line or buried gas line, depending on whether the cable is strung on the gen-tie line or buried in a shallow trench beside the access road.

Potential impacts from the new access road that would exit the frontage road and head north to the BSPP boundary would be mitigated by following requirements of the FHA, CalTrans and SOPs/BMPs for encroachment of state highways.

Alternatives

Reconfigured Alternative

The Reconfigured Alternative would be a 1,000 MW solar facility like the proposed BSPP. Three of the proposed solar fields (Units 1, 2, and 4) would remain at their proposed locations. These include the two northern solar fields and the southeastern solar field. Unit 3 (the southwestern solar field) would be relocated approximately 0.8 mile south of its proposed location.

The transmission line, road access, fiber optic cable and gas pipeline would remain approximately the same length as for the proposed BSPP. The required linear facility routes could require minor adjustments.

Reduced Acreage Alternative

The Reduced Acreage Alternative would retain only Units 1, 2 and 4 of the proposed BSPP, with the ability to generate 750 MW. Unit 3 (250 MW) would not be constructed.

The transmission line, fiber optic cable, and road access would remain approximately the same length as for the proposed BSPP. The gas pipeline would also remain approximately the same length as for the proposed BSPP. The required linear facilities routes could require minor adjustment to accommodate the smaller configuration.

No Action Alternative A

Under this No Action alternative, the ROW application would be denied, and the ROW grant would not be authorized. The CDCA (1980, as amended) would not be amended.

Impacts associated with the BSPP would likely only be delayed by selecting No Action Alternative A since this region of the United States has extremely positive characteristics for solar power generation. If the BSPP were not approved, another application for a different solar generating facility, or a different type of solar generating facility, would likely be filed at some time in the near future. The various solar energy technologies require the use of different amounts of land. Depending on the type of facility, the amount of acreage needed could be less, approximately the same or larger than the proposed BSPP. Additionally, an application could also be filed for a wind energy facility or any other kind of use, and impacts would result based on the size and specific use requested.

No Action Alternative B

Under this No Action alternative, the ROW application would be denied, and the ROW grant would not be authorized. The BLM would amend the CDCA Plan to make the proposed site unavailable for future solar energy development. As a result, no solar energy project would be constructed on the site.

Impacts resulting from the proposed BSPP would not occur under No Action Alternative B. However, the land would remain open to other types of rights-of-way and/or land use authorizations, resulting in impacts specific to a future use other than solar energy generation.

No Action Alternative C

Under this No Action alternative, the ROW application would be denied, and the ROW grant would not be authorized. The CDCA (1980, as amended) would be amended to identify the BSPP application area as suitable for any type of solar energy development.

Impacts associated with the proposed action would likely only be delayed by selecting No Action Alternative C since this region of the United States has extremely positive characteristics for solar power generation. If the BSPP were not approved, another application for a different solar generating facility or a different type of facility would likely be filed at some time in the near future. The various solar energy technologies require the use of different amounts of land. Depending on the type of facility, the amount of acreage needed could be less, approximately the same or larger than the proposed BSPP. This No Project/No Action Alternative potentially could result in the conversion of acreage upwards to the amount of the proposed BSPP or possibly even a larger amount of land.

4.6.3 Discussion of Cumulative Impacts

Impacts resulting from construction, operation, maintenance and decommissioning of the BSPP could result in a cumulative effect on lands and reality with other past, present, or reasonably foreseeable future actions. The geographic scope of the cumulative effects analysis for lands and realty consists of eastern Riverside County, based on the jurisdictional boundaries within which the impacts of land use decisions of the proposed action and other projects could be additive, countervailing or synergistic. Potential cumulative effects on lands and realty could occur during the BSPP's proposed 69-month construction period if, for example, it would be necessary to relocate or modify existing facilities within a ROW; during the projected 30-40 year lifespan of the proposed action if, for example, future projects were constrained by the placement of BSPP-related facilities are located within designated corridors; or pursuant to closure and decommissioning activities.

Existing conditions within the cumulative impacts area reflect a combination of the natural condition and the effects of past actions and are described in PA/FEIS Chapter 3. Direct and indirect effects of the construction, operation and maintenance, and closure and decommissioning of the BSPP are analyzed above. Past, present and reasonably foreseeable future actions making up the cumulative scenario are identified in Section 4.1. Among them, other ROW applications for linear and non-linear projects that could be developed in eastern Riverside County include other utility-scale solar projects and the proposed Eagle Crest Pump Storage project and associated Gen-tie transmission lines. Additional actions that could have cumulative impacts include, among others, substation projects, and activities in OHV areas and LTVAs. ROW grants and other land use decisions associated with these actions and projects would affect the nature, type, and intensity of uses authorized on the lands potentially affected by the BSPP and its ancillary facilities. Permitting the Proposed action and other projects within the cumulative impact area could affect the amount of land that would be available for permitting by the BLM for other uses consistent with the CDCA. Permitting the BSPP and other projects for the single use proposed (e.g., solar energy development, pump storage, etc.) would restrict the use of the lands during the life of those projects reducing the number of acres of lands available to be managed by the BLM for other multiple uses. Upon decommissioning of the BSPP and other single use projects, affected acreage would become available for multiple use management by the BLM.

Multiple ROW applications are pending in the vicinity of the BSPP and no applicant has yet attained priority. Based on the interconnection applications for the transition cluster participants, the Applicant would build a double-circuit 230 kV line carrying 1,000 MW from the BSPP site; NextEra and Solar Reserve would build a double-circuit 230 kV line to carry NextEra's Genesis-McCoy 250 MW project on one circuit and Solar Reserve's 150 MW on the second circuit; and enXco would build a double-circuit 230 kV transmission path through the BSPP site to support its McCoy development efforts north of the Genesis-McCoy site.

BLM's general policy is to review ROWs in the order in which they are received, which would result in consideration and possible approval of a ROW grant for the BSPP before the consideration and possible award of ROWS for projects to the north. However, each of the pending applications would be for a project on BLM land and it is in BLM's interest to have utilities on its property co-located in common utility corridors. Accordingly, BLM has asked the Applicant to provide connectivity around the BSPP site for use by the other proposed projects.

Two sets of policies bear on this issue. (Solar Millennium 2010). First, it is the policy of the Western Electricity Coordinating Council (WECC) to separate adjacent transmission lines with a distance that is equal to or greater than the longest span length of the transmission lines in question, which in this case is approximately 900 feet. WECC is a regional entity responsible for promoting and coordinating bulk electric system reliability in the western United States. (WECC 2010). Second, California Independent System Operator (CAISO) policies specify the maximum amount of power that can be interrupted (to avoid exceeding the single largest risk to the ISO controlled system) as follows:

1. 1,150 MW of capacity can be interrupted under a single contingency (i.e. one transmission line or circuit, one transformer bank, etc.)

2. 1,400 MW of capacity can be interrupted under a double contingency (i.e. two transmission lines or circuits (including two circuits on a single tower), two transformer banks, etc.)

The CAISO operates the energy grid, provides fair and open transmission access, and promotes environmental stewardship and infrastructure development. (CAISO 2010). Of these two sets of policies, the WECC transmission line separation criterion appears most likely to constrain efforts to accommodate connectivity of the other proposed actions.

Based on the WECC separation criterion (and other considerations, including visual impacts), any proposed connection should minimize line crossings. Given the routing of the existing generator tie line routings in the area, this could be accomplished if the transmission line were to be located on the far east or west side of the BSPP site, rather than though it. The eastern routing would disturb less biologically-sensitive area, but would necessitate a line crossing under the BSPP transmission lines. This possible routing could accommodate one double-circuit 230 kV transmission line. If a line crossing were to be determined necessary, then such a crossing south of the solar fields would be preferred because more space would be available to accommodate the crossing and provide the necessary clearances. The western routing would not necessitate any line

crossings along the route to the Colorado River Substation. The other pending projects could achieve connectivity via either of these routes.

The connectivity of future applicants also could be accommodated consistent with BLM interests by using an existing an existing two-mile wide utility corridor (designed in the CDCA Plan as "Planned Utility Corridor J") that is located east of the BSPP site and along California's eastern border, from the Arizona-California-Mexico border to its end, just west of Parker, Nevada. There remains sufficient capacity within Corridor J to accommodate up to 50 new transmission or gas lines and/or expansion of existing uses.

Cumulative impacts would vary by alternative only to the degree to which direct and indirect impacts vary by alternative.

4.6.4 Summary of Mitigation Measures

Compliance with industry SOPs and BMPs would avoid or mitigate potential safety and land use inconsistency issues related to the type of facilities proposed. SOPs and BMPs designed and adopted by the power industry would be followed to reduce or eliminate potential problems that might result from the gen-tie line crossing I-10 and existing power lines north and south of the highway. Additionally, SOPs and BMPs developed and adopted by the gas industry would be followed to ensure the public safety and continued safe operations of any underground power or gas lines the four inch gas line would cross. The SOPs and BMPs designed and adopted by the FHA and Caltrans provide for utilities to cross highways safely to protect the traveling public. Likewise, the SOPs and BMPs that would be tied to an encroachment permit from Caltrans for access from Black Rock Road to the site would ensure that the public safety would be protected during and after construction.

4.6.5 Residual Impacts after Mitigation Measures were Implemented

There would be no known residual impacts to existing authorized uses.

4.6.6 Unavoidable Adverse Impacts

Approval of a solar energy generation project would result in the land not being available for other uses during the life of the BSPP. However, once the BSPP is no longer viable and is decommissioned, the land would be available for other uses in the future, depending on the condition of the land and the use proposed.

4.7 Impacts on Mineral Resources

4.7.1 Impact Assessment Methodology

Applicable geologic maps and reports for this area (CDC 2000; CDC 2001; CDMG 1967; CDMG 1968; CDMG 1990; CDMG 1994a; CDMG 1998; CDMG 1999; McCleod, 2009; Kleinfelder 2009; USGS 2006; and USGS 2009b) were reviewed. The proposed BSPP is currently not used for mineral production, nor is it under claim, lease, or permit for the production of locatable, leasable, or salable minerals/mineral materials. Sand and gravel resources are present at the site and could potentially be a source of salable resources; however, such materials are present throughout the regional area. The BSPP should not have a significant impact on the availability of such resources.

The proposed BSPP site is mapped as Mineral Resource Zone (MRZ)-4 (CDMG 1994a). The designation MRZ-4 refers to “areas of no known mineral occurrences where geologic information does not rule out either the presence or absence of industrial mineral resources.” The carbonate bedrock outcrop of Little Maria Mountains and metasediments of the northern McCoy Mountains about 10 miles north and northwest of BSPP site are designated as MRZ-3a, which is defined as “areas containing known mineral occurrences of undetermined mineral resource significance.” The Big Maria Mountains to the northeast also cover a significant area that has been designated as MRZ-3a (CDMG 1994a).

There are a variety of active and past mining operations in the general area (within an approximate 10-mile radius) near the proposed site, but no active operations or mining claims occur within the proposed boundaries or along the offsite linear features.

4.7.2 Direct and Indirect Impacts

As discussed above, there are currently no mining claims, mineral leases or mineral materials disposal permits within the BSPP area or on the site.

There would be no direct or indirect impacts to locatable or leasable minerals. Mineral materials are present on the site, however there are suitable materials throughout the area; therefore, there would be no direct or indirect impacts to the availability and development of mineral materials resources within or near the BSPP area.

4.7.3 Alternatives

There would be no difference in the direct or indirect impacts of the proposed action, or any of the proposed alternatives.

4.7.4 Cumulative Impacts

Because the proposed action and alternatives would have no direct or indirect effects on mineral resources, no cumulative effects analysis is required or provided for this resource.

4.8 Impacts on Multiple Use Classes

4.8.1 Impact Assessment Methodology

The Multiple Use Class (MUC) Guidelines in Table 1 of the CDCA (1980, as amended) provide that solar electrical generation facilities may be allowed in MUC Limited (L), Moderate (M), and Intensive (I) areas after NEPA requirements are met.

4.8.2 Discussion of Direct and Indirect Impacts

Proposed Action

The proposed action would be developed entirely within MUC-L. The total acreage of the Limited MUC that would be affected by construction of the solar facility under the proposed action would be 5,952 acres. No changes in the MUC classification would be required prior to approving the ROW grant. Nonetheless, approval of the ROW grant would restrict multiple use opportunities on the BSPP site to a single dominate use for the anticipated 30-40 year lifespan of the proposed action. This restriction would be lifted upon closure and decommissioning of the proposed action; thereafter, use opportunities on the site would return to the pre-BSPP conditions discussed in FEIS Chapter 3.

Alternatives

Reconfigured Alternative

Like the Proposed Action, the Reconfigured Alternative would be developed entirely within MUC-L. Potential direct and indirect impacts on lands designated MUC-L would be the same as for the proposed action. The total acreage of the Limited MUC that would be affected by construction of the Reconfigured Alternative would be 6,102 acres.

Reduced Acreage Alternative

Like the Proposed Action, the Reduced Acreage Alternative would be developed entirely within MUC-L. Potential direct and indirect impacts on lands designated MUC-L would be the same as for the proposed action. The total acreage of the Limited MUC that would be affected by construction of the Reduced Acreage Alternative would be 4,752 acres

No Action Alternative A

If the No Action Alternative A were selected, impacts associated with the proposed action would not occur because no use opportunities would be foreclosed. However, other utility-scale solar power facilities could be built, which would result in the same impact on MUC L by this alternative that the proposed action would cause.

No Action Alternative B

If the No Action Alternative B were selected, the proposed BSPP would not be approved by the BLM, and the BLM would amend the CDCA Plan to make the proposed site unavailable for future solar development. As a result, no solar energy project would be constructed on the site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Plan. No use opportunities otherwise allowable on MUC-L designated land would be foreclosed.

No Action Alternative C

If the No Action Alternative C were selected, the proposed BSPP would not be approved by the BLM, and BLM would amend the CDCA Plan to allow for other solar projects on the site. The development of another solar energy project on the site would result in the same foreclosure of use opportunities that would result from the proposed action.

4.8.3 Discussion of Cumulative Impacts

The geographic scope of the cumulative effects analysis for multiple use classes would include CDCA Plan area lands designated MUC-L. This geographic scope was established based on the boundaries of the affected resource. Potential cumulative impacts could result from construction of the proposed action and, to the extent they exist, would continue until closure and decommissioning is complete, because this is the period of time during which the existence of the proposed action would preclude the development of other uses on the site and, thereby, affect the type of use opportunities on MUC-L lands throughout the CDCA Plan area.

Existing conditions within the cumulative impacts area reflect a combination of the natural condition; MUC-L use opportunities presently being exercised; and, where such opportunities are not currently are being exercised, the flexibility to elect to pursue one or more among them at some point in the future. The effects of past actions are reflected in the discussion in FEIS Chapter 3. Effects of the BSPP on MUCs, as analyzed above, essentially relate to opportunity cost: if the BSPP or an alternative is developed on the site, the site cannot be used for use opportunities that otherwise would be available on the site. Past, present and reasonably foreseeable future actions making up the cumulative scenario are identified in Section 4.1. Among them, any projects that also would be developed on lands designated for MUC-L uses would similarly restrict available use opportunities within that classification for the duration of those projects. Any cumulative impact on multiple uses classes that could be caused by any of the action alternatives, No Action Alternative A or No Action Alternative C would be the same as for the proposed action. By contrast, because No Action Alternative B would not limit the multiple use opportunities that presently area available on the site, No Action Alternative B would not contribute to any cumulative impact on multiple use classes.

4.8.4 Summary of Mitigation Measures

No mitigation measures are required.

4.8.5 Residual Impacts after Mitigation Measures were Implemented

There would be no known residual impacts to existing authorized uses.

4.8.6 Unavoidable Adverse Impacts

Approval of the ROW grant would have the effect of limiting current multiple use opportunities of the facility footprint area to a single dominate use for the life of the project.

4.8.7 Land Use Plan Amendment Consistency Analysis

The proposed land use plan amendment to be made by the BLM is a site identification decision only. The proposed action and all of its alternatives are located within Multiple Use Class L. The classification designations govern the type and degree of land-use action allowed within the classification area. All land use actions and resource-management activities on public lands within a multiple-use class delineation must meet the guidelines for that class. Multiple use class L allows electric generation plants for solar facilities after NEPA requirements are met. These guidelines are listed on Table 1, Multiple Use Class Guidelines, to the CDCA Plan of 1980 (at page 15). The specific application of the multiple use class designations and resource management guidelines for a specific resource or activity are further discussed in the plan elements section of the CDCA Plan. In Class L designations, the authorized officer is directed to use his judgment in allowing for consumptive uses by taking into consideration the sensitive natural and cultural values that might be degraded.

The proposed site location for the BSPP meets the Multiple Use Class Guidelines (as applicable to the particular project/alternatives/site locations) as noted in the CDCA Plan for the following reasons:

1. **Agriculture:** Agricultural uses of Class L lands are not allowed, with the exception of livestock grazing. The site is not currently used for agriculture, and neither the proposed action nor alternatives would involve use of the site for agriculture. Therefore, all alternatives would be in conformance with this guideline.

2. **Air Quality:** Class L lands, including the proposed site location and the alternatives, are to be managed to protect their air quality and visibility in accordance with Class II objectives of the Federal Clean Air Act. The worst-case long-term emissions that would be associated with the proposed action are provided in Table 4.2-5. These values have been compared to emissions objectives for air quality and visibility associated with Class II areas in 40 CFR 52.51, and are all well below the limitations required for Class II areas. The emissions associated with the alternatives would be approximately the same or lower than those of the proposed action. Therefore, all of the alternatives would conform to the Class II objectives referenced in the CDCA Plan guidelines.

3. **Water Quality:** Class L designations are to be managed to provide for the protection and enhancement of surface and groundwater resources, and BMPs are to be used to avoid degradation and to comply with Executive Order 12088. Section 4.19 of this PA/FEIS

evaluated the proposed action and alternatives for groundwater use conflicts, the potential to impact groundwater quality, and the potential to impact surface water resources including drainage and water quality. Development and operation of the BSPP facility on an active alluvial fan raises concerns associated with changing stormwater surface flows across the project site. The incorporation of engineered drainages and waterways, sized to meet relevant stormwater flow rates and drainage requirements were developed by the applicant, in coordination with the BLM and the CEC, to reduce these potential impacts. Although BLM has not established BMPs for solar projects, the agency has reviewed, and agrees with the implementation of the BMPs that would be associated with the BSPP and its alternatives. These BMPs have been derived from a variety of sources, including those proposed by the applicant as part of the project design, those required by the CEC through its Conditions of Certification, and those required for compliance with other state and Federal laws designed to protect water resources. Implementation of these BMPs, and BLM's standard term and condition requiring compliance with other Federal, state, and local regulations, would constitute compliance with Executive Order 12088. The measures would be applicable to all project alternatives, and would therefore conform to the guidelines in Table 1 of the CDCA Plan.

4. **Cultural and Paleontological Resources:** Cultural and paleontological resources will be preserved and protected. Procedures described in 36 CFR 800 will be observed where applicable. As described in detail in Sections 4.4 and 4.10, impacts on cultural and paleontological resources resulting from the development and operation of the proposed project, Reconfigured Alternative, and Reduced Acreage Alternative would be mitigated, and therefore all three alternatives would conform to the MUC Guidelines. Adverse effects on cultural resources determined eligible for the National Register of Historic Places will be resolved in accordance with a Programmatic Agreement being prepared for the project in consultation with the California State Historic Preservation Officer, Indian tribes and other interested parties in accordance with Section 106 of the National Historic Preservation Act. Identification of the site location for the proposed action or any of the alternatives is subject to the MUC Guidelines for cultural and paleontological resource protection as is evidenced by the applicability of the guidelines to the specific facility proposal. As such, all of the site locations and the site location alternatives are within the MUC Guidelines for cultural and paleontological resource protection established by the CDCA Plan.

5. **Native American Values:** Native American cultural and religious values will be protected and preserved with appropriate Native American groups consulted. Consultation with Indian tribes was initiated at the earliest stages of project planning and will continue during the NEPA compliance process. Opportunities have been provided to allow Indian tribes to identify places and resources of importance to them and to express concerns regarding cultural and religious values that could be impacted by the proposed action and alternatives. Adverse effects on any places of traditional cultural or religious importance that are identified by tribes will be resolved in accordance with the Programmatic Agreement being developed for the project with tribal participation. Therefore, cultural guidelines with respect to requirements for consultation have been met. In addition, the protection of cultural resources as discussed in Section 4.4 ensures that preservation and protection of Native American cultural and religious values associated with cultural resources is accomplished in accordance with the CDCA Plan MUC Guidelines.

6. **Electrical Generation Facilities:** Solar generation may be allowed after NEPA requirements are met. The analysis contained in the PA/FEIS, which addresses the proposed action and its alternatives, comprise the NEPA compliance required for this MUC guideline.

7. **Transmission Facilities:** Class L guidelines allow electric transmission to occur in designated ROW corridors. The proposed action and/or its alternatives would include transmission not within a designated ROW corridor. The CDCA Plan, while recognizing the potential compatibility of solar generation facilities on public lands, requires that all sites associated with power generation or transmission not identified in the Plan be considered through the Plan Amendment process. Therefore, the BLM would undertake a project-specific CDCA Plan amendment along with the ROW grant for the BSPP. Upon BLM's amendment of the CDCA plan for the BSPP, the BSPP project would be fully compliant with the CDCA Plan. This PA/FEIS acts as the mechanism for meeting NEPA requirements, and also provides the analysis required to support a Plan Amendment identifying the facility within the Plan.

8. **Communication Sites:** The proposed action and/or its alternatives would not involve the installation of communications sites.

9. **Fire Suppression:** Measures in Class L areas will be taken in accordance with specific fire management plans, subject to such conditions as the authorized officer deems necessary. The project area is within the area covered by the Fire Management Activity Plan (FMAP) 1996 for the California Desert developed by the National Park Service and BLM. The FMAP brings together fire management goals for biological resources, wilderness, and other sources and establishes fire management standards and prevention and protection programs. The FMAP includes limitations on fire suppression methods in critical habitat and other tortoise habitat; the limitations are designed to limit habitat disturbance while keeping fires small. While the FMAP addresses management and suppression of wildfires, it does not address incidents on specific facilities such as power plants. The applicant has developed fire suppression measures that would be used for the proposed BSPP, Reconfigured Alternative, or the Reduced Acreage Alternative, and these measures are discussed in Section 4-23. The Project applicant would be required to install a fire protection/control system on site in including a fire water supply system and associated infrastructure, and to comply with state and federal regulations regarding worker safety and training. Additionally, under Mitigation Measure WORKER SAFETY-7, the applicant would be required to provide funding to the Riverside County Fire Department to ensure available resources to fight potential fires on site. However, the specific fire management plan is not relevant to the types of fires that would be addressed by the applicant. Should a fire occur in the area that is not specific to the facility, it would be addressed by BLM, not by the applicant, and it would be addressed in conformance with the Fire Management Plan, and therefore, would conform to the guideline for Fire Management for this multiple use class.

10. **Vegetation:** Table 1 of the CDCA Plan includes a variety of guidelines associated with vegetation. These are addressed in the EIS as follows:

    Native Plants – Removal of native plants in Class L areas is only allowed by permit after NEPA requirements are met, and after development of necessary stipulation. Approval of the ROW grant for the proposed BSPP, Reconfigured Alternative, or the

Reduced Acreage Alternative would constitute the permit for such removal. The mitigation measures in the FEIS and conditions of approval to be required in the Record of Decision would constitute the stipulations to avoid or minimize impacts from the removal.

Harvesting of plants by mechanical means – Harvesting by mechanical means is also allowed by permit only. Although the proposed project and its alternatives would include the collection of succulents and seeds to assist with reclamation, the removal of these items would not be done for distribution to the public. Also, the guidelines for vegetation harvesting include encouragement of such harvesting in areas where the vegetation would be destroyed by other actions, which would be the case with the proposed project and its alternatives. Therefore, the proposed project and its alternatives would be in conformance with this MUC guideline.

Rare, Threatened, and Endangered Species, State and Federal – In all MUC areas, all state and federally listed species will be fully protected. In addition, actions which may jeopardize the continued existence of federally listed species will require consultation with the U.S. Fish and Wildlife Service. As evaluated in Section 4-17, Vegetation Resources, no federally or state listed plants would be impacted by proposed BSPP, Reconfigured Alternative, or the Reduced Acreage Alternative.

Sensitive Plant Species – Identified sensitive plant species would be given protection in management decisions consistent with BLM's policy for sensitive species management, BLM Manual 6840. The objective of this policy is to conserve and/or recover listed species, and to initiate conservation measures to reduce or eliminate threats to BLM sensitive species to minimize the likelihood of and need for listing. One BLM sensitive plant, Harwood's eriastrum (= Harwood's woollystar), was identified in the BSPP area, and impacts and mitigation associated with this species were discussed in Section 4-17. In an effort to protect this species, BLM worked with the applicant and the Energy Commission to develop mitigation (see Mitigation Measure BIO-19 in Appendix F) to reduce the number of individuals of the species that would be affected. Because these measures are intended to reduce threats to this species to minimize the likelihood of listing, these measures are in conformance with the MUC guidance in the CDCA Plan.

Unusual Plant Assemblages (UPAs) – No UPAs have been identified on the site of the proposed BSPP, Reconfigured Alternative, or the Reduced Acreage Alternative.

Vegetation Manipulation – Manipulation of vegetation in Class L areas by mechanical control or aerial broadcasting is not permitted. Vegetation manipulation is defined in the CDCA Plan as removing noxious or poisonous plants from rangelands; increasing forage production; creating open areas within dense brush communities to favor certain wildlife species; or eliminating introduced plant species. A weed control plan would be developed under mitigation measure BIO-14, a site-specific weed management plan. Such actions would be conducted as part of the proposed BSPP, Reconfigured Alternative, or the Reduced Acreage Alternative. Weed management under the weed management plan would conform to Federal, State, and local regulations, so would be allowed. Therefore, each alternative would conform to the guidelines.

11. **Land Tenure Adjustment:** Class L land will not be sold. The proposed action and/or its alternatives would not involve any sale of public lands.

12. **Livestock Grazing:** The proposed action and/or its alternatives would not involve the addition of livestock grazing to a Class l area where it does not already occur.

13. **Minerals:** The proposed action and/or its alternatives would not involve the development of minerals on Class L lands.

14. **Motorized Vehicle Access/Transportation:** Pursuant to the CDCA LUP guidelines in Class L areas, new roads may be developed under ROW grants or approved plans of operations. In areas designated as limited use area for OHV use, such as the site locations under consideration in this FEIS, changes to the transportation network (new routes, re-routes, or closures) in "limited" areas may be made through activity-level planning or with site-specific NEPA analysis (IM 2008-014). Modifications to area OHV designations (open, closed, or limited) require amendment to the RMP. There are no area OHV designations that are being made or modified through the proposed action or any of the alternatives. With the proposed action and/or its alternatives, existing routes are being closed, and a new routes may be required to be created in limited OHV areas per mitigation measure BLM-OHV-2. As such, these changes may be made with site-specific NEPA analysis. This analysis is provided in Section 4.16. The access needs for the BSPP do not substantially differ among the various site location alternatives presented in the PA/FEIS. For any of the site location alternatives, road ROW grants would be approved to allow access to the BSPP site. This activity falls within the CDCA LUP guideline noted above.

15. **Recreation:** The proposed action and/or its alternatives would not involve the use of the proposed action or alternative sites for recreational uses.

16. **Waste Disposal:** The proposed action and/or its alternatives would not involve the development of waste disposal sites on the proposed project or alternative sites

17. **Wildlife Species and Habitat:** Table 1 of the CDCA Plan includes a variety of guidelines associated with wildlife. These are addressed in the EIS as follows:

    Rare, Threatened, and Endangered Species, State and Federal – In all MUC areas, all state and federally listed species and their critical habitat will be fully protected. In addition, actions which may jeopardize the continued existence of federally listed species will require consultation with the U.S. Fish and Wildlife Service. As discussed in Section 4-21, Wildlife Resources, the desert tortoise, which is listed as federally and state threatened, would be affected by the proposed BSPP, Reconfigured Alternative, or the Reduced Acreage Alternative. All of the action alternatives would affect a small portion of critical habitat. As specified in the guideline, BLM has initiated formal consultation with the U.S. Fish and Wildlife Service in accordance with Section 7 of the Endangered Species Act. BLM has worked with the Energy Commission, USFWS, CDFG, and applicant to develop protection and compensation measures for the desert tortoise, which include stringent avoidance measures, the full level of compensation required by USFWS for this category of tortoise habitat, and enhancement and protection measures in other areas. Therefore, the proposed project and its alternatives would comply with the guideline to provide full protection to the species.

Sensitive Species – Identified species would be given protection in management decisions consistent with BLM's policy for sensitive species management, BLM Manual 6840. The objective of this policy is to conserve and/or recovered listed species, and to initiate conservation measures to reduce or eliminate threats to BLM sensitive species to minimize the likelihood of and need for listing. Several BLM sensitive wildlife species (other than the desert tortoise, identified and discussed in the previous paragraph) are present or likely to occur on habitat associated with the proposed BSPP and its alternatives include Couch's spadefoot toad, Mojave fringe-toed lizard, western burrowing owl, golden eagle, ferruginous hawk, mountain plover, Bendire's thrasher, LeConte's thrasher, several species of bats, and Nelson's bighorn sheep. Those species that are likely to occur on the BSPP would be protected under a number of mitigating measures meant to avoid, minimize, or compensate for impacts from the project. These mitigating measures include: BIO-1, BIO-2, BIO-3, BIO-4, BIO-5, BIO-6, BIO-7, BIO-8, BIO-9, BIO-10, BIO-11, BIO-12, BIO-13, BIO-15, BIO-16, BIO-17, BIO-18, BIO-20, BIO-21, BIO-23, BIO-24, BIO-25, BIO-26, BIO-27, BIO-28; discussed in detail in Appendix G of this FEIS.

The proposed BSPP, Reconfigured Alternative, or the Reduced Acreage Alternative, including the mitigation measures associated with these actions, would involve habitat manipulation to improve habitat (such as tortoise fencing along roads and project boundaries and placement of a water source in big horn sheep habitat) and introduction of native species (through the translocation of tortoises). Introduction of native species is permitted in Class L areas, and habitat manipulation is allowed subject to environmental assessment, as is done within this EIS. Therefore, the proposed project and its alternatives would be in conformance with these guidelines.

The proposed BSPP, Reconfigured Alternative, or the Reduced Acreage Alternative, including the translocation associated with these actions, may involve the control of depredation of ravens. Therefore, this guideline is applicable to these actions but is allowed subject to conformance with state and federal laws in MUC L.

18. **Wetland/Riparian Areas:** Wetland/riparian areas will be considered in all proposed land use actions. These issues were considered in the analysis of the site location for the proposed project and its alternatives. However, no wetlands or riparian areas are present in the BSPP.

19. **Wild Horses and Burros:** Under the CDCA Plan guidelines, populations of wild and free-roaming horses and burros will be maintained in healthy, stable herds, but will be subject to controls to protect sensitive resources. As discussed in Section 3.22, there are no Wild Horse and Burro Herd Areas (HAs) or Herd Management Areas (HMAs) that would be affected by the proposed action and/or its alternative. Therefore, the proposed action and/or its alternatives would conform with the requirements of the guidelines in the CDCA Plan.

4.9 Impacts on Noise

4.9.1 Impact Assessment Methodology

The Applicant presented the results of an ambient noise survey in the CEC RSA. Ambient noise levels were measured at the boundary of the BSPP site and nearest residence on June 2 to June 4, 2009. One long-term measurement was taken at the nearest residence over a 25-hour period between 2:00 p.m., June 2, and 1:00 p.m., June 4, 2009. The survey was performed using acceptable equipment and techniques. The Applicant also predicted the operational noise level at the nearest sensitive receptor.

One sensitive noise receptor, mobile home located approximately 725 feet east and 775 feet south of the BSPP site, was identified within the vicinity of the proposed action.

4.9.2 Discussion of Direct and Indirect Impacts

Proposed Action

Noise impacts associated with the proposed action could be created by short-term construction activities, long-term operation of the BSPP, and short-term closure and decommissioning activities.

Construction

Construction noise is usually a temporary phenomenon. Construction of the BSPP would be expected to be typical of similar projects in terms of equipment used and other types of activities (Solar Millennium 2009a, AFC § 5.8.3.1). Construction of an industrial facility, such as a power plant, is typically noisier than permissible under usual noise ordinances. In order to allow the construction of new facilities, construction noise during certain hours of the day is commonly exempt from enforcement by local ordinances (See County of Riverside, 2007 Ordinance 847.1 Section 2h).

Since construction noise typically varies with time, it is most appropriately measured by, and compared with, the L_{eq} (energy average) metric. Typical Environmental and Industry Sound Levels are provided in Table 4.9-1. For the BSPP, construction noise would elevate the existing ambient noise level at the nearest residential receptor (LT) by 16 dBA, a considerable increase. See Table 4.9-2. Even though the overall construction period for the BSPP is expected to require 69 months, the duration of construction activities in an area that could have a considerable impact at LT would be limited to several months.

Typically, “high pressure steam blow” is the loudest noise encountered during construction of a project incorporating a steam turbine. After erection and assembly of the feed water and steam systems, the piping and tubing that comprise the steam path have accumulated dirt, rust, scale, and construction debris such as weld spatter, dropped welding rods, and the like. If the plant were started up without thoroughly cleaning out these systems, all this debris would find its way into

TABLE 4.9-1
TYPICAL ENVIRONMENTAL AND INDUSTRY SOUND LEVELS

Noise Source (at distance)	A-Weighted Sound Level in Decibels (dBA)	Noise Environment	Subjective Impression
Civil Defense Siren (100')	140-130		Pain Threshold
Jet Takeoff (200')	120		Very Loud
Very Loud Music	110	Rock Music Concert	
Pile Driver (50')	100		
Ambulance Siren (100')	90	Boiler Room	
Freight Cars (50')	85		
Pneumatic Drill (50')	80	Printing Press Kitchen with Garbage Disposal Running	Loud
Freeway (100')	70		Moderately Loud
Vacuum Cleaner (100')	60	Data Processing Center Department Store/Office	
Light Traffic (100')	50	Private Business Office	
Large Transformer (200')	40		Quiet
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing

SOURCE: Handbook of Noise Measurement, Arnold P.G. Peterson, 1980.

TABLE 4.9-2
PREDICTED CONSTRUCTION NOISE LEVEL

Receptor	Highest Construction Noise Level L_{eq} (dBA)[a]	Measured Existing Ambient, Average Daytime L_{eq} (dBA)[b]	Cumulative, Using Highest Noise Level of 48 dBA	Change
LT	61	45	61	+16

SOURCES: [a] Solar Millennium 2009a, AFC Section 5.8.3.1.
[b] Table 3.10-1

the steam turbine, quickly destroying the machine. In order to prevent this, before the steam system is connected to the turbine, the steam line temporarily is routed to the atmosphere. Traditionally, high pressure steam is then raised in the boiler or a temporary boiler and allowed to escape to the atmosphere through the steam piping. This flushing action, referred to as a *high pressure steam blow*, is quite effective at cleaning out the steam system. A series of short steam blows, lasting two or three minutes each, are performed several times daily over a period of two or three weeks. At the end of this procedure, the steam lines are connected to the steam turbine, which is then ready for operation. Alternatively, high pressure compressed air can be substituted for steam. High pressure steam blows, if unsilenced, can produce noise levels as high as 129 dBA

at a distance of 50 feet; this would amount to roughly 100 dBA at LT. Unsilenced steam blows could be disturbing at the nearest noise-sensitive receptors, depending on the frequency, duration, and noise intensity of venting. With a silencer installed on the steam blow piping, noise levels are commonly attenuated to 89 dBA at 50 feet.

Operation and Maintenance

During operation, the primary noise source of the BSPP would be the power block, where the steam turbine generator, air-cooled condenser, electric transformer, and various pumps and fans would be located. The four power blocks of the BSPP (one for each 250 MW unit) would be located in each of the four quadrants in the middle of the solar arrays. In addition, there would be diesel-powered emergency generators, which would be enclosed by a noise-reducing structure that would reduce noise levels to approximately 70 dBA at 50 feet. The overall noise generated by these various noise sources would be based on the configuration of the sources, the number and power rating of the equipment, and any noise-reducing measures incorporated. Noise measurement locations are shown in Figure 44.

The Applicant performed noise modeling to determine anticipated noise impacts on sensitive receptors (Solar Millennium 2009a, AFC § 5.8.3.2). The Applicant has predicted the operational noise level at the nearest sensitive receptor as shown in Table 4.9-3.

TABLE 4.9-3
PREDICTED OPERATIONAL NOISE LEVEL AT THE IDENTIFIED SENSITIVE RESIDENTIAL RECEPTOR

Receptor	Project Alone Operational Noise Level (dBA)[a]	Measured Existing Ambient, Daytime Leq (dBA)[b]	Cumulative Leq (dBA)[b]	Increase in Existing Ambient (dBA)
LT	40	45	46	+1

SOURCES: [a] Solar Millennium 2009a, AFC § 5.8.3.2.
[b] Table 4.9-2, above

The Riverside County Noise Ordinance allows for different levels of acceptable noise depending upon land use. Section 4 of Ordinance No. 847 (Regulating Noise) limits noise on any property that causes the exterior noise level on any other occupied property to 55 dBA during the daytime hours and 45 dBA during the nighttime hours, for noise-sensitive receptors within a very low density rural area, such as the area surrounding the site. The Applicant predicts the proposed action's operational noise level at receptor LT to be 40 dBA Leq (Solar Millennium 2009a, AFC § 5.8.3.2). This level would be acceptable under the County Code.

Adverse impacts on residential receptors can also be identified by comparing predicted power plant noise levels with the nighttime ambient background noise levels at the nearest sensitive residential receptors. The proposed action could have limited nighttime activities related to maintenance. The Applicant's projection of the noise level from these activities at LT is 20 dBA

(Solar Millennium 2009a, AFC § 5.8.3.2). This is significantly lower than the average nighttime ambient noise level of 36 dBA at LT.

All water pipes and gas pipes would be underground and therefore silent during plant operation. Noise effects from electrical interconnection lines typically do not extend beyond the lines' right-of-way easements and would be inaudible to receptors.

Vibration from an operating power plant could be transmitted through two primary means: ground (ground-borne vibration) and air (airborne vibration). The operating components of the BSPP plant would consist of high-speed steam turbine generators and various pumps and fans. All of these pieces of equipment must be carefully balanced in order to operate; permanent vibration sensors would be attached to the turbines and generators. Based on experience with numerous previous projects employing similar equipment, ground-borne vibration from the BSPP would be undetectable by any likely receptor. Airborne vibration (low frequency noise) can rattle windows and objects on shelves and can rattle the walls of lightweight structures. However, none of the proposed equipment is likely to produce noticeable low frequency noise beyond the site boundaries. This makes it highly unlikely that the BSPP would cause perceptible airborne vibration effects at any offsite noise-sensitive receptor.

Closure and Decommissioning Impacts

The anticipated lifespan of the BSPP is estimated to be 30-40 years. Closure and decommissioning-related noise impacts could result from the operation of construction equipment that would be required to dismantle and restore the site. Such impacts would be a one-time, limited-duration event. Anticipated noise levels would be less than expected for construction, since no high pressure steam blows would be required, but in other respects are anticipated to be comparable to construction noise levels.

Worker Effects

The Applicant acknowledges the need to protect plant operating and maintenance workers from noise hazards and commits to compliance with all applicable LORS (Solar Millennium 2009a, AFC Section 5.8.4). Signs would be posted in areas of the plant with noise levels exceeding 85 dBA (the level that OSHA recognizes as a threat to workers' hearing), and hearing protection would be required and provided.

4.9.3 Alternatives

Reconfigured Alternative

The Reconfigured Alternative would an incrementally longer construction period due to the increased footprint of 150 acres, the same types of construction activity, and substantially similar operation and maintenance-related and closure and decommission-related requirements as the proposed action. Therefore, the noise that would result from such activities associated with the Reconfigured Alternative would be slightly greater, but still substantially similar to that of the proposed action.

Reduced Acreage Alternative

The Reduced Acreage Alternative essentially would reduce the total construction-, operation- and decommissioning-related activity on the site by roughly 25 percent because of the elimination of one of the four power blocks. However, peak construction impacts could be same as the proposed action, since construction activity levels would likely be similar. Operations-related noise levels would be reduced since only three of the four proposed units would be operated and maintained. Given the reduced amount of equipment to dismantle and reduction in acreage to be restored, closure and decommission-relating impacts would be reduced. Therefore, overall, noise generated by implementation of this alternative would be less than that expected to be generated by the proposed action. However, if the Reduced Acreage Alternative were selected, other renewable projects could be developed on other sites in Riverside County, the Colorado Desert, or in adjacent states as developers strive to provide renewable power that complies with utility requirements and Federal and state mandates in order to compensate for the loss of generation compared to the proposed action.

No Action Alternative A

If this alternative were selected, of the anticipated noise impacts of the proposed action would occur. Instead, the land on which the BSPP is proposed would become available to other uses consistent with the CDCA Plan, potentially including another renewable energy project. If the proposed action is not approved, renewable projects would likely be developed on other sites in Riverside County, the Colorado Desert, or in adjacent states as developers strive to provide renewable power that complies with utility requirements and Federal and state mandates. Noise impacts would be expected to result from such projects, but perhaps not within hearing of the sensitive receptors that could be affected by the proposed action.

No Action Alternative B

Because the CDCA Plan would be amended under this alternative to make the site unavailable for future solar development, it is expected that the site could remain in its existing condition, without new sources of noise. Any noise impacts associated with the development of renewable energy projects in other locations are anticipated to be comparable to those generated by the proposed action, but would affect different sensitive receptors.

No Action Alternative C

Because the CDCA would be amended under this alternative, it is possible that the site would be developed with the same or a different solar technology. Comparable noise levels could be expected from the construction and decommissioning of such projects; operations-phase noises could vary depending on the type, arrangement and location on the site of necessary equipment.

4.9.4 Discussion of Cumulative Impacts

Noise impacts resulting from construction, operation, maintenance and decommissioning of the BSPP and alternatives could result in a cumulative effect with other past, present, or reasonably foreseeable future actions. The geographic scope of the cumulative effects analysis for noise is limited to the distance over which sounds generated by the proposed action could be heard, as shown in Figure 44, *Noise Measurement Locations and Noise Contours*. This geographic scope of cumulative impacts analysis was established based on the natural boundaries of the affected resource. Potential cumulative effects on visual resources could occur during the BSPP's proposed 69-month construction period, during the projected 30-40 year lifespan of the proposed action, or result from closure and decommissioning, i.e., if other noise-generating activities were to occur within these timeframes and within the cumulative impacts area. Existing conditions within the cumulative impacts area reflect a combination of the natural condition and the effects of past actions and are described in FEIS chapter 3. Direct and indirect effects of the BSPP are analyzed above. Past, present and reasonably foreseeable future actions making up the cumulative scenario are identified in Section 4.1. However, none of these projects would be developed in the cumulative impacts area for noise impacts. Consequently, the incremental noise impacts of the proposed action and alternatives would not combine with impacts of other projects in a way that would be additive, countervailing or synergistic.

4.9.5 Summary of Mitigation Measures

The mitigation measures imposed by the Energy Commission as Conditions of Certification for the BSPP would avoid or reduce impacts on the quality of the human environment. These mitigation measures are set forth in **Appendix G**. The following mitigation measures would avoid or minimize impacts on noise resources:

NOISE-1, NOISE-2, NOISE-3, NOISE-4, NOISE-5, NOISE-6, NOISE-7.

4.9.6 Residual Impacts after Mitigation Measures were Implemented

Residual impact would be associated with construction where the noise would exceed the Riverside County Regulations. The exceedance would be an increase of 16 dBA for the 69 month construction period.

4.9.7 Unavoidable Adverse Impacts

Same as described in Residual Impacts.

4.10 Impacts on Paleontological Resources

4.10.1 Impact Assessment Methodology

A paleontological resources assessment (Solar Millennium 2009a; SWCA 2009) was prepared. A paleontological literature and records search was conducted by the Natural History Museum of Los Angeles County (McCleod 2009). Records from the University of California Berkeley online database for the site area were searched (UCMP 2009). Site-specific information was also generated by the Applicant for the BSPP. All research was conducted in accordance with accepted assessment protocol (Society of Vertebrate Paleontology (SVP 1995)) to determine whether any known paleontological resources exist in the general area and how they might be impacted by the proposed action and alternatives.

4.10.2 Discussion of Direct and Indirect Impacts

Proposed Action

There is a high probability that paleontological resources would be encountered during grading and excavation in the alluvial deposits of the McCoy Wash area located in the northeastern and southern portions of the BSPP site; older alluvium deposits; and in the central portion of the BSPP site. Further, deeper excavations in the younger alluvium that will encounter the underlying older alluvium soils also would have a high probability to encounter paleontological resources.

Since the depth to Pleistocene age sediments beneath Holocene deposits in the central portion of the site is unknown, all sediments beneath disturbed ground initially would be treated as highly sensitive. After monitoring of grading and trenching activities during construction at the site, the project paleontological resource specialist (PRS) may determine the appropriate depth above which the coarse and fine grained soils are Holocene in age, have a low sensitivity and low potential for adverse impacts on paleontological resources.

Construction of the proposed action would include grading, foundation excavation, utility trenching and possibly drilled shafts. These activities could damage or destroy paleontological resources. The probability of encountering paleontological resources is considered to be generally high on portions of the site based on the soils profile, SVP assessment criteria, and the near surface occurrence of the sensitive geologic units. The potential for encountering fossils hosted in Quaternary alluvium would increase with the depth of cut. Excavations for ancillary facilities and new pipelines and on-site excavations that penetrate surficial Holocene age alluvium would have a higher probability of encountering potentially high sensitivity materials, although sensitive materials could occur nearer the surface. Mitigation measures could not avoid or reduce fossil disturbance associated with drilled shaft foundations; however, the volume of disturbance and probability of encountering fossil resources would be low in comparison to the grading and excavation activities.

As the value of paleontological resources is predicated on their discovery within a specific geological host unit, construction of the BSPP could result in a net gain to the science of

paleontology by allowing fossils that would not otherwise have been found to be recovered, identified, studied, and preserved.

Operation, future decommissioning and closure of the proposed new solar energy generating facility would not adversely impact paleontological resources because the ground disturbed during these activities would have been already disturbed, and impacts mitigated as required, during construction of the proposed action.

4.10.3 Alternatives

Reconfigured Alternative

Because the geologic units that would be disturbed by the Reconfigured Alternative are the same as those that would be disturbed by the proposed action, potential impacts to paleontological resources would be the same as for the proposed action.

Reduced Acreage Alternative

Because the ground disturbance from the Reduced Acreage Alternative would be less than that associated with the proposed action, potential impacts to paleontological resources would be correspondingly reduced.

No Action Alternative A

If this No Action Alternative were selected, the construction and operational impacts of the BSPP would not occur. There would be no grading of the site, no installation of power generation and transmission equipment, and no potential impacts to paleontological resources.

In the absence of the BSPP, however, other power plants, both renewable and non-renewable, would have to be constructed to serve the demand for electricity and to meet Renewable Portfolio Standards (RPS). If No Action Alternative A were chosen, other utility-scale solar power facilities could be built, and the impacts to the environment could be similar to those of the proposed action because these technologies require large amounts of land like that required for the BSPP. No Action Alternative A also could lead to the siting of other non-solar renewable energy facilities to help achieve the California RPS.

Paleontological resources have been documented in the general area of the site. As the value of paleontological resources is predicated on their discovery within a specific geologic host unit, construction of the BSPP could result in a net gain to the science of paleontology by allowing fossils that would not otherwise have been found to be recovered, identified, studied, and preserved. No Action Alternative A would preclude this potential net gain.

No Action Alternative B

Under this alternative, the proposed BSPP would not be approved by the CEC and BLM and the BLM would amend the CDCA Plan to make the proposed site unavailable for future solar

development. As a result, no solar energy project would be constructed on the site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Plan.

Because the proposed BSPP would not be approved, and the CDCA Plan would be amended to make the area unavailable for future solar development, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site. As a result, the geologic conditions of the site would not be expected to change noticeably from existing conditions and, as such, this No Action Alternative would not result in impacts to paleontological resources, nor would it result in the potential benefits of additional knowledge about local paleontological resources that could result from construction of the proposed action. However, in the absence of this project, other renewable energy projects could be constructed elsewhere to meet State and Federal mandates; such projects would be expected to have similar impacts to the proposed action, but in other locations.

No Action Alternative C

Under this alternative, the proposed BSPP would not be approved by the BLM and BLM would amend the CDCA Plan to allow for other solar projects on the site. As a result, it is possible that another solar energy project could be constructed on the site.

Because the CDCA Plan would be amended, it is possible that the site would be developed with the same or a different solar technology. As a result, impacts related to paleontology would result from the construction and operation of the solar technology and would likely be similar to the impacts from the proposed action. Different solar technologies require different amounts of grading and maintenance; however, it is expected that all the technologies would require some grading and maintenance. As such, No Action Alternative C could result in impacts and benefits related to paleontology similar to the impacts under the proposed action.

4.10.4 Discussion of Cumulative Impacts

Impacts on paleontological resources, both beneficial and adverse, resulting from construction, operation, maintenance and decommissioning of the BSPP could result in a cumulative effect with other past, present, or reasonably foreseeable future actions. The geographic scope of the cumulative effects analysis for paleontological resources consists of eastern Riverside County. This geographic scope of cumulative impacts analysis was established based on a conservative estimate of the natural boundaries of the affected resource. It is expected that potential cumulative effects on these resources would be limited to ground disturbing activities associated with construction, and with closure and decommissioning. Operation and maintenance of the BSPP and action alternatives would not be expected to impact paleontological resources. Paleontological resources have been documented in the general area of the site.

Existing conditions within the cumulative impacts area reflect a combination of the natural condition and the effects of past actions and are described in FEIS Chapter 3. Direct and indirect effects of the BSPP and alternatives are analyzed above. Past, present and reasonably foreseeable

future actions making up the cumulative scenario are identified in Section 4.1. As the value of paleontological resources is associated with their discovery within a specific geologic host unit, the potential impacts to paleontological resources due to construction activities would be mitigated as required by measures PAL-1 through PAL-7. Implementation of these mitigation measures should result in a net gain to the science of paleontology by allowing fossils that would not otherwise have been found to be recovered, identified, studied, and preserved. Consequently, cumulative impacts, in consideration with other projects that comprise the cumulative scenario within the paleontological cumulative impacts area, should be either neutral (no fossils encountered) or positive (fossils encountered, preserved, and identified). Construction and other ground-disturbing activities associated with past and present projects could add to fossil discoveries which would enhance our common understanding of the prehistoric climate, geology, and geographic setting of the region for the benefit of current and future generations. Cumulative impacts would vary by alternative only to the degree to which direct and indirect impacts would vary by alternative.

4.10.5 Summary of Mitigation Measures

The mitigation measures imposed by the Energy Commission as Conditions of certification for the BSPP would avoid or reduce impacts on the quality of the human environment. These mitigation measures are set forth in Appendix G. To mitigate impacts to paleontological resources, the following measures will be implemented:

PAL-1, PAL-2, PAL-3, PAL-4, PAL-5, PAL-6, PAL-7

4.10.6 Residual Impacts after Mitigation Measures were Implemented

No residual impacts on paleontological resources would exist after mitigation measures were implemented. Implementation of mitigation should result in a net gain to the science of paleontology by allowing fossils that would not otherwise have been found to be recovered, identified, studied, and preserved.

4.10.7 Unavoidable Adverse Impacts

No unavoidable adverse impacts would be expected to occur. Construction and ground-disturbing activities associated with closure and decommissioning, including site restoration, could add to fossil discoveries which would enhance understanding of the prehistoric climate, geology, and geographic setting of the region for the benefit of current and future generations.

4.11 Impacts on Public Health and Safety

4.11.1 Impact Assessment Methodology

To complete this analysis of environmental consequences associated with impacts on public health and safety, the BLM considered potential impacts on the following issue areas: hazardous materials/hazardous waste, waste management, unexploded ordnance (UXO), abandoned mined lands (AML) undocumented immigrants (UDI), transmission line safety and nuisance, traffic and transportation safety, worker safety and fire protection, public and private air strips/airfields, and geologic hazards. The approach for each of these issues is described below.

4.11.2 Hazardous Materials

4.11.2.1 Impact Assessment Methodology

Risk of Accidents and Spills

This analysis includes a review and assessment of the potential for the transportation, handling, and use of hazardous materials to impact the surrounding community. All chemicals were evaluated. This analysis addresses the potential impacts on all members of the population including the young, the elderly, and people with existing medical conditions that may make them more sensitive to the adverse effects of hazardous materials. In order to accomplish this goal, analysis uses the most current public health exposure levels (both acute and chronic) that are established to protect the public from the effects of an accidental chemical release.

In order to assess the potential for released hazardous materials to travel off site and affect the public, this analysis includes several aspects of the proposed use of these materials at the facility. It is recognized that some hazardous materials must be used at power plants. Therefore, this analysis was conducted by examining the choice and amount of chemicals to be used, the manner in which the Applicant would use the chemicals, the manner by which they would be transported to the facility and transferred to facility storage tanks, and the way in which the Applicant plans to store the materials on site.

Engineering and administrative controls concerning hazardous materials use are included as part of the proposed action. Engineering controls are the physical or mechanical systems, such as storage tanks or automatic shut-off valves, that can prevent the spill of hazardous material from occurring, or that can either limit the spill to a small amount or confine it to a small area. Administrative controls are the rules and procedures that workers at the facility must follow that would help to prevent accidents or to keep them small if they do occur. Both engineering and administrative controls can act as methods of prevention or as methods of response and minimization. In both cases, the goal is to prevent a spill from moving off-site and causing harm to the public.

This analysis includes a review and evaluation of the Applicant’s proposed use of hazardous materials as described by the Applicant (Solar Millennium 2009a, Section 5.6). To conduct this analysis, the BLM followed these five steps:

Step 1: Review of the chemicals and the amounts proposed for on-site use as listed in Table 5.6-3 of the AFC (Solar Millennium 2009a) and determine the need for and appropriateness of their use.

Step 2: Removed from further assessment those chemicals proposed for use in small amounts or whose physical state is such that there is virtually no chance that a spill would migrate off-site and impact the public.

Step 3: Review and evaluate measures proposed by the Applicant to prevent spills, including engineering controls, such as automatic shut-off valves and different-sized transfer-hose couplings, and administrative controls, such as worker training and safety management programs.

Step 4: Review and evaluate measures proposed by the Applicant to respond to accidents. These measures also included engineering controls such as catchment basins and methods to keep vapors from spreading and administrative controls such as training emergency response crews.

Step 5: Analyze the theoretical impacts on the public of a worst-case spill of hazardous materials, as reduced by the mitigation measures proposed by the Applicant. When mitigation methods proposed by the Applicant would be sufficient, no further mitigation is recommended. If additional mitigation measures would improve the proposed action, additional prevention and response controls are proposed.

Health Risk Assessment

A screening level risk assessment has been performed using simplified assumptions that are intentionally biased toward protection of public health. That is, an analysis was designed that overestimated public health impacts from exposure to the emissions of the proposed action. In reality, it is likely that the actual risks from the proposed action would be much lower than the risks as estimated by the screening level assessment. The risks for screening purposes are based on examining conditions that would lead to the highest, or worst-case, risks and then using those conditions in the study. Such conditions include:

1. using the highest levels of pollutants that could be emitted from the plant;
2. assuming weather conditions that would lead to the maximum ambient concentration of pollutants;
3. using the type of air quality computer model that predicts the greatest plausible impacts;
4. calculating health risks at the location where the pollutant concentrations are estimated to be the highest;
5. assuming that an individual’s exposure to cancer-causing agents occurs continuously for 70 years; and
6. using health-based standards designed to protect the most sensitive members of the population (i.e., the young, elderly, and those with respiratory illnesses).

A screening level risk assessment, at a minimum, would include the potential health effects from inhaling hazardous substances. Some facilities may also emit certain substances that could present a health hazard from non-inhalation pathways of exposure (OEHHA 2003, Tables 5.1, 6.3, 7.1). When these substances are present in facility emissions, the screening level analysis includes the following additional exposure pathways: soil ingestion, dermal exposure, and mother's milk (OEHHA 2003, p. 5-3).

The risk assessment process for the proposed BSPP addresses two categories of health impacts: chronic (long-term) non-cancer effects, and cancer risk (also long-term). Since the only toxic air contaminant (TAC) emitted from this proposed action would be diesel particulate from diesel-fueled, emergency engines, and since only long-term health effects have been established for diesel particulate, no acute (short-term) health effects are calculated for this proposed action.

Chronic health effects are those that arise as a result of long-term exposure to lower concentrations of pollutants. The exposure period is considered to be approximately from 12 percent to 100 percent of a lifetime, or from eight to 70 years (OEHHA 2003, p. 6-5). Chronic health effects include diseases such as reduced lung function and heart disease.

The analysis for non-cancer health effects compares the maximum BSPP contaminant levels to safe levels called *Reference Exposure Levels*, or RELs. These are amounts of toxic substances to which even sensitive people can be exposed and suffer no adverse health effects (OEHHA 2003, p. 6-2). These exposure levels are designed to protect the most sensitive individuals in the population, such as infants, the aged, and people suffering from illness or disease which makes them more sensitive to the effects of toxic substance exposure. The RELs are based on the most sensitive adverse health effect reported in the medical and toxicological literature and include margins of safety. The margin of safety addresses uncertainties associated with inconclusive scientific and technical information available at the time of standard setting and is meant to provide a reasonable degree of protection against hazards that research has not yet identified. The margin of safety is designed to prevent pollution levels that have been demonstrated to be harmful, as well as to prevent lower pollutant levels that may pose an unacceptable risk of harm, even if the risk is not precisely identified as to nature or degree. Health protection is achieved if the estimated worst-case exposure is below the relevant REL. In such a case, an adequate margin of safety exists between the predicted exposure and the estimated threshold dose for toxicity.

Exposure to multiple toxic substances may result in health effects that are equal to, less than, or greater than effects resulting from exposure to the individual chemicals. Only a small fraction of the thousands of potential combinations of chemicals have been tested for the health effects of combined exposures. In conformity with the California Air Pollution Control Officers Association (CAPCOA) guidelines, the health risk assessment assumes that the effects of each substance are additive for a given organ system (OEHHA 2003, pp. 1-5, 8-12). Other possible mechanisms due to multiple exposures include those cases where the actions may be synergistic or antagonistic (where the effects are greater or less than the sum, respectively). For these types of substances, the health risk assessment could underestimate or overestimate the risks.

For carcinogenic substances, the health assessment considers the risk of developing cancer and assumes that continuous exposure to the cancer-causing substance occurs over a 70-year lifetime. The risk that is calculated is not meant to project the actual expected incidence of cancer, but rather a theoretical upper-bound number based on worst-case assumptions.

Cancer risk is expressed in chances per million and is a function of the maximum expected pollutant concentration, the probability that a particular pollutant will cause cancer (called *potency factors* and established by OEHHA), and the length of the exposure period. Cancer risks for each carcinogen are added to yield total cancer risk. The conservative nature of the screening assumptions used means that actual cancer risks due to emissions from the proposed action are likely to be considerably lower than those estimated.

The screening analysis is performed to assess worst-case risks to public health associated with the proposed action. If the screening analysis predicts no significant risks, then no further analysis is required. However, if risks are above the significance level, then further analysis, using more realistic site-specific assumptions, would be performed to obtain a more accurate assessment of potential public health risks.

Chronic Non-cancer Health Effects

The assessment of non-cancer health effects is calculated using a *hazard index*. A hazard index is a ratio comparing exposure from facility emissions to the reference (safe) exposure level. A ratio of less than 1.0 signifies that the worst-case exposure is below the safe level. The hazard index for every toxic substance that has the same type of health effect is added to yield a Total Hazard Index. A Total Hazard Index of less than 1.0 indicates that cumulative worst-case exposures are less than the RELs. Under these conditions, health protection from the proposed action is likely to be achieved, even for sensitive members of the population. In such a case, it is presumed that there would be no significant non-cancer project-related public health impacts.

Cancer Risk

Regulations implementing the provisions of Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986 (Health & Safety Code Section 25249.5 et seq.) were used for guidance to determine a cancer risk significance level. Title 22, California Code of Regulations Section 12703(b) states that “the risk level which represents no significant risk shall be one which is calculated to result in one excess case of cancer in an exposed population of 100,000, assuming lifetime exposure.” This level of risk is equivalent to a cancer risk of 10 in one million, which is also written as 10×10^{-6}. An important distinction is that the Proposition 65 significance level applies separately to each cancer-causing substance, whereas this analysis bases significance on the total risk from all cancer-causing chemicals. Thus, the manner in which the significance level is applied in this analysis is more conservative (health-protective) than that applied by Proposition 65.

As noted earlier, the initial risk analysis for a proposed action is typically performed at a screening level, which is designed to overstate actual risks, so that health protection can be ensured. The analysis also addresses potential impacts on all members of the population including the young, the elderly, people with existing medical conditions that may make them more

sensitive to the adverse effects of toxic air contaminants and any minority or low-income populations that are likely to be disproportionately affected by impacts. To accomplish this goal, this analysis uses the most current acceptable public health exposure levels set to protect the public from the effects of airborne toxics. When a screening analysis shows cancer risks to be above the significance level, refined assumptions would likely result in a lower, more realistic risk estimate. Based on refined assumptions, if risk posed by the facility exceeds the significance level of 10 in one million, appropriate measures would be required to reduce the risk to less than significant. If, after all risk reduction measures had been considered, a refined analysis identifies a cancer risk greater than 10 in one million, the risk would be deemed to be significant.

4.11.2.2 Discussion of Direct and Indirect Impacts

Impact Assessment Methodology

Accidents and Spills

The types of hazardous materials that would be used during construction and operation of the BSSP are identified in Table 4.11-1, including the material name, the Chemical Abstracts Service (CAS) Number, the application/use of the chemical, the hazard characteristics, the maximum quantity proposed for use on site, and the CERCLA/SARA reportable quantity (RQ). The purpose of this hazardous materials management analysis is to identify the hazardous materials that would be used at the BSSP site and to determine the affects of their transportation to the site, the use, handling, storage, and disposal on the environment.

The affects are determined by the following:

1. identifying the types and amounts of hazardous substances that BSPP could emit to the environment;

2. estimating amounts of pollutants that people could be exposed to through inhalation, ingestion, and dermal contact; and

3. characterizing potential health risks by comparing worst-case exposure to safe standards based on known health effects.

Small Quantity Hazardous Materials

During the construction phase of the proposed action, hazardous materials proposed for use include paint, solvents, gasoline, diesel fuel, motor oil, lubricants, and welding gases (Solar Millennium 2009a, Section 5.6.3.2). The Applicant proposes to add a concrete batch plant to the construction phase that would require the use of some additional hazardous materials, such as fly ash and calcium chloride. In addition, a fuel depot is proposed for the construction phase that would include two 2,000-gallon on-road vehicle diesel tanks, two 8,000-gallon off-road vehicle diesel tanks, and one 500-gallon gasoline tank. The fuel depot would be constructed with secondary containment areas surrounding each tank and the covered maintenance area, and a concrete pad in the vehicle washing area (Galati & Blek 2010f).

TABLE 4.11-1
HAZARDOUS MATERIALS PROPOSED FOR USE

Material	CAS No.	Application	Hazardous Characteristics	Maximum Quantity On Site	CERCLA SARA RQ[a]
Acetylene	74-86-2	Welding gas	Health: moderate toxicity Physical: combustible, flammable	800 cubic feet total	10,000 pounds
Activated Carbon	7440-44-0	Control of VOCs from HTF expansion tank	Health: non-toxic (when unsaturated), low to moderate toxicity when saturated, depending on the absorbed material Physical: combustible solid	4,000 pounds	N/A
Argon	7440-37-1	Welding gas	Health: low toxicity Physical: non-flammable gas	800 cubic feet	N/A
Calcium Hypochlorite 100 percent	7778-54-3	Water treatment	Health: moderate toxicity Physical: corrosive, irritant	Minimal onsite storage for water treatment, not expected to exceed 50 pounds	10 pounds
Carbon Dioxide	124-38-9		Health: low toxicity Physical: nonflammable gas	15 tons	N/A
Diesel Fuel	68476-34-6		Health: low toxicity Physical: combustible liquid	300 gallons	N/A
Herbicide Roundup® or equivalent	38641-94-0		Health: low toxicity Physical: irritant	No onsite storage, brought on site by licensed contractor, used immediately	N/A
Hydraulic Fluid	64741-89-5		Health: low to moderate toxicity Physical: Class IIIB combustible liquid	500 gallons in equipment, maintenance inventory of 110 gallons in 55-gallon steel drums	N/A
Lube Oil	64742-65-0		Health: low toxicity Physical: N/A	10,000 gallons in equipment and piping, additional maintenance inventory of up to 550 gallons in 55-gallons steel drums	N/A
Mineral Insulating Oil	8042-47-5		Health: low toxicity Physical: N/A	32,000 gallons	N/A
Nitrogen	7727-37-9		Health: low toxicity Physical: non-flammable gas	7,500 pounds	N/A
Oxygen	7782-44-7	Welding gas	Health: low toxicity Physical: oxidizer	800 cubic feet	NA

TABLE 4.11-1 (Continued)
HAZARDOUS MATERIALS PROPOSED FOR USE

Material	CAS No.	Application	Hazardous Characteristics	Maximum Quantity On Site	CERCLA SARA RQ[a]
Oxygen Scavenger Reagent Acetic Acid (60 percent) Iodine (20 percent) De-ionized Water (20 percent)	64-19-7 7553-56-2 7732-18-5	Water treatment	Health: moderate toxicity Physical: corrosive, irritant	Minimal onsite storage for water treatment, not expected to exceed 50 pounds	5,000 pounds
Soil Stabilizer Active Ingredient: acrylic or vinyl acetate polymer or equivalent	N/A		Health: non-toxic Physical: N/A	No onsite storage, supplied in 55 gallon drums or 400-gallon totes, used immediately	N/A
Sulfuric Acid (29.5 percent)	7664-93-9	Contained in batteries	Health: high toxicity Physical: corrosive and water reactive	2,000 gallons	1,000 pounds
Therminol VP-1 Biphenyl (26.5 percent) Diphenyl Ether (73.5 percent)	 92-52-4 101-84-8	Heat transfer fluid in solar array	Health: moderate toxicity Physical: irritant; combustible liquid (Class III-B)	1.3 million gallons	100 pounds N/A

NOTE:
[a] Reportable quantities for a pure chemical, per the Comprehensive Environmental Response, Compensation, and Liability Act.

SOURCE: Millennium 2009a, Table 5.6-3.

No acutely toxic hazardous materials would be used on site during construction, and none of these materials would pose a significant potential for off-site impacts as a result of the quantities on site, their relative toxicity, their physical state, and/or their environmental mobility. Any impact of spills or other releases of these materials would be limited to the site because of the small quantities involved, their infrequent use (and therefore reduced chances of release), and/or the temporary containment berms used by contractors. Petroleum hydrocarbon-based motor fuels, mineral oil, lube oil, and diesel fuel are all very low volatility and represent limited off-site hazards even in larger quantities.

During operations, hazardous chemicals would be used such as cleaning agents, water treatment chemicals, welding gasses, oils, activated carbon, and other various chemicals.

Large Quantity Hazardous Materials

The proposed action would require the use of large quantities of natural gas and Therminol VP1. Following are discussions relative to the proposed action's use of these hazardous materials and any associated effects.

Natural gas at the proposed facility only would be used to fuel the auxiliary boilers and HTF heaters. Natural gas poses a fire and/or possible explosion risk because of its flammability. Natural gas is composed of mostly methane, but also contains ethane, propane, nitrogen, butane, isobutene, and isopentane. It is colorless, odorless, tasteless and lighter than air. Natural gas can cause asphyxiation when methane is 90 percent in concentration. Methane is flammable when mixed in air at concentrations of five-14 percent, which is also the detonation range. Natural gas, therefore, poses a risk of fire and/or possible explosion if a release occurs under certain specific conditions. However, due to its tendency to disperse rapidly (Lees 1998 as cited in the CEC RSA June 2010), natural gas is less likely to cause explosions than many other fuel gases such as propane or liquefied petroleum gas, but can explode under certain confined conditions (as demonstrated by the natural gas detonation in Belgium in July 2004). 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.

Natural gas pipelines must be designed to meet the appropriate level of California Public Utilities Commission (CPUC) General Order 112 standards and 49 CFR 192 standards. CPUC General Order 112-E, Section 125.1 requires that, at least 30 days prior to the construction of a new pipeline, the owner must file a report with the commission that will include a route map for the pipeline. In addition, natural gas pipelines must be constructed and operated in accordance with the Federal Department of Transportation (DOT) regulations, including Title 49, Code of Federal Regulations (CFR), Parts 190, 191, and 192 (see Table 1-1, *LORS*). Compliance with existing LORS would be sufficient to ensure minimal risks of pipeline failure.

At the BSPP site, natural gas would not be stored on-site but delivered by the Southern California Gas Company (SCG) via a new 10-mile pipeline (shown in Figure 2a) that would connect to an existing main south of I-10. Approximately eight miles of pipeline would be installed within the site boundaries and two miles off-site (Solar Millennium 2009a, Section 2.5.5.1). The risk of a

fire and/or explosion on site could be reduced through adherence to applicable codes and the development and implementation of effective safety management practices. The use of double-block and bleed valves for gas shut off and automated combustion controls, as required by NFPA code 85A, would 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 reduce the potential for equipment failure because of either improper maintenance or human error.

Therminol VP1™ (a biphenyl) is the heat transfer fluid (HTF) that would 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 percent diphenyl ether and 26.5 percent biphenyl, and is a solid at temperatures below 54 °F. Therminol can therefore be expected to remain liquid if a spill occurs.

Approximately 1,300,000 gallons of HTF would be stored at the BSPP contained in the pipes and heat exchanger. Isolation valves would be placed throughout the HTF piping system designed to automatically block off sections of the piping in which a loss of pressure is detected (Solar Millennium 2009a, Section 5.6.3.3). 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.

Construction-related Risks to Public Health

Potential risks to public health during construction could be associated with exposure to toxic substances in contaminated soil disturbed during site preparation, as well as diesel exhaust from heavy equipment operation. Criteria pollutants associated with the operation of heavy equipment and particulate matter from earth moving are discussed in Chapter 3.2 and 4.2 (Air Resources).

The operation of construction equipment would result in air emissions from diesel-fueled engines. Diesel emissions would be generated from sources such as trucks, graders, cranes, welding machines, electric generators, air compressors, and water pumps. Although diesel exhaust contains criteria pollutants such as nitrogen oxides, carbon monoxide, and sulfur oxides, it also includes a complex mixture of thousands of gases and fine particles. These particles are primarily composed of aggregates of spherical carbon particles coated with organic and inorganic substances. Diesel exhaust contains over 40 substances that are listed by the U.S. Environmental Protection Agency (USEPA) as hazardous air pollutants and by the California Air Resources Board (ARB) as toxic air contaminants.

Exposure to diesel exhaust may cause both short- and long-term adverse health effects. Short-term effects can include increased cough, labored breathing, chest tightness, wheezing, and eye and nasal irritation. Long-term effects can include increased coughing, chronic bronchitis, reductions in lung function, and inflammation of the lung. Epidemiological studies also strongly suggest a causal relationship between occupational diesel exhaust exposure and lung cancer.

Based on a number of health effects studies, the Scientific Review Panel (SRP)[1] on Toxic Air Contaminants recommended a chronic REL for diesel exhaust particulate matter of five micrograms per cubic meter (µg/m^3) and a cancer unit risk factor of 3x10^{-4} (µg/m^3)[1] (SRP 1998, p. 6). [The SRP, established pursuant to California Health and Safety Code Section 39670, evaluates the risk assessments of substances proposed for identification as toxic air contaminants by ARB and the Department of Pesticide Regulation (DPR). The SRP reviews the exposure and health assessment reports and the underlying scientific data upon which the reports are based.] The SRP did not recommend a value for an acute REL, since available data in support of a value was deemed insufficient. On August 27, 1998, ARB listed particulate emissions from diesel-fueled engines as a toxic air contaminant and approved SRP's recommendations regarding health effect levels.

Construction of the BSPP, including site preparation, is anticipated to take place over a period of 69 months (Solar Millennium 2009a, Section 2.5.7). As noted earlier, assessment of chronic (long-term) health effects assumes continuous exposure to toxic substances over a significantly longer time period, typically from eight to 70 years.

In order to model the cancer risk from construction emissions, the Applicant divided the total amount of diesel particulate matter (DPM) by the exposure period of 70 years which is typically used to assess health risks. The Applicant's modeling of worst-case construction emissions (using a 100-meter spacing receptor grid) found that the cancer risk was estimates to be 2.97 in one million at the point of maximum impact (PMI), below the level of significance of 10 in one million. The chronic hazard index was found to be 0.00178 at the PMI, below the level of significance of 1.0. The PMI was located along the eastern site boundary in a remote area that is not frequently accessed by the public (AECOM2010a, DR-PH-157).

Emissions Sources

The emissions sources at the proposed BSPP site would include four auxiliary boilers, four HTF heaters, four two-cell cooling towers, four diesel-fueled emergency generators, four diesel-fueled emergency fire pumps, four HTF expansion/ullage systems, and DPM from maintenance vehicles (mirror washing, weed abatement, soil stabilizer applicators, and water trucks).

As noted earlier, the first step in a health risk assessment is to identify potentially toxic compounds that may be emitted from the facility. Table 5.10-4 of the AFC lists toxic air contaminants that may be emitted by the proposed action along with the toxicity values used to calculate their health effects. Toxicity values include RELs which are used to calculate short-term and long-term non-cancer health effects, and cancer unit risks, which are used to calculate the lifetime risk of developing cancer, as published in the OEHHA Guidelines (OEHHA 2003).

[1] The SRP, established pursuant to California Health and Safety Code Section 39670, evaluates the risk assessments of substances proposed for identification as Toxic Air Contaminants by ARB and the Department of Pesticide Regulation (DPR). The SRP reviews the exposure and health assessment reports and the underlying scientific data upon which the reports are based.

Table 4.11-2 lists toxic emissions and shows how each contributes to the health risk analysis. For example, the first row shows that oral exposure to benzene is not of concern, but if inhaled, benzene could have cancer, chronic (long-term) non-cancer health effects, and acute (short-term) effects.

TABLE 4.11-2
TYPES OF HEALTH IMPACTS AND EXPOSURE ROUTES ATTRIBUTED TO TOXIC EMISSIONS*

Substance	Oral Cancer	Oral Non-cancer	Inhalation Cancer	Non-cancer (Chronic)	Non-cancer (Acute)
Benzene			X	X	X
Biphenyl					
Chloroform		X	X	X	
Chromium (Hexavalent)			X	X	X
Copper					X
Dichlorobenzene			X	X	
Diesel Exhaust			X	X	
Formaldehyde			X	X	X
Hexane				X	
Naphthalene		X	X	X	
Polycyclic Aromatic Hydrocarbons (PAHs)	X	X	X	X	
Vanadium				X	X
Toluene				X	X

SOURCE: OEHHA 2003 Appendix L and Solar Millennium 2009a, Table 5.10-3 and Table DR-PH-163-1 (AECOM2010a).

Appendix E.3 and Tables 5.10-5 through 5.10-8 of the Palo Verde Solar I AFC (August 2009) list non-criteria pollutants and their emission factors that may be emitted from the sources listed above. Emission factors for most plant components were obtained from the USEPA emission factors database (AP-42) and the California Air Toxics Emission Factors (CATEF II) database. Data from existing solar plants was used to estimate emissions from the HTF expansion tanks, which consist of benzene (calculated as 99.99 percent) and biphenyl (calculated as 0.01 percent). Since biphenyl has not been assigned a health risk factor, it was not included in the HRA calculations (Solar Millennium 2009a, Section 5.10.3.2).

In response to CEC Data Request 161, the Applicant stated that volatile organic compound (VOC) emissions from the HTF expansion tank are estimated to be 137 pounds per MW per year, based on comparable thermal solar projects and on an operational mass balance for the ullage system developed by the Applicant's solar design engineer. In regards to the composition of VOC emissions from the HTF expansion tank, the Applicant notes that HTF breakdown products may include benzene, toluene, xylene, phenol, naphthalene, methane, ethane, benzenol, and biphenyl. In the health risk assessment conducted for this action, the Applicant modeled the entire amount of HTF emissions as benzene since it is the compound with the highest health risk factors for cancer and non-cancer effects (AECOM2010a).

In response to CEC Data Requests 158 and 160, the Applicant provided total daily and yearly DPM emissions from maintenance vehicles and total cumulative daily and yearly emissions of particulate matter down to 2.5 micrometers in diameter (PM2.5), including both fugitive dust and DPM. The total DPM emissions from maintenance vehicles were estimated to be 8.04 pounds per year and the total PM2.5 emissions were estimated to be 8,555 pounds per year. DPM emissions are therefore negligible when compared to non-exhaust emissions, the majority of which (over 80 percent) is attributed to mirror washing trucks. The estimated DPM emissions from maintenance vehicles were added to the Applicant's revised health risk assessment.

Since the BSPP intends to use groundwater for cooling, the potential exists for TACs present in the water to disperse into the air via cooling tower drift. In response to Data request 163, the Applicant conducted water sampling and analysis of the on-site well water for VOCs, petroleum hydrocarbons, pesticides, herbicides, minerals and metals. The results are presented in Table DR-PH-163-1, showing that four metals considered as TACs are present in the well water. Emissions calculations for the health risk assessment were revised to include the metals detected in the groundwater samples (AECOM2010a).

Emissions Levels

Once potential emissions are identified, the next step is to quantify them by conducting a "worst case" analysis. Maximum hourly emissions are required to calculate acute (one-hour) non-cancer health effects, while estimates of maximum emissions on an annual basis are required to calculate cancer and chronic (long-term) non-cancer health effects.

The next step in the health risk assessment process is to estimate the ambient concentrations of toxic substances that may result from the proposed action. This is accomplished by using a screening air dispersion model and assuming conditions that result in maximum impacts. The Applicant's screening analysis was performed using the ARB/OEHHA Hotspots Analysis and Reporting Program (HARP) modeling program. Finally, ambient concentrations were used in conjunction with RELs and cancer unit risk factors to estimate health effects which might occur from exposure to facility emissions. Exposure pathways, or ways in which people might come into contact with toxic substances, include inhalation, dermal (through the skin) absorption, soil ingestion, consumption of locally grown plant foods, and mother's milk.

The above method of assessing health effects is consistent with OEHHA's Air Toxics Hot Spots Program Risk Assessment Guidelines (OEHHA 2003) referred to earlier, and results in the following health risk estimates.

Proposed Action

The Applicant's revised screening health risk assessment, including all sources as presented in DR-PH-159, resulted in a maximum acute hazard index of 0.089 and a maximum chronic hazard index of 0.00053 at the PMI. The worst-case cancer risk was found to be 1.11 at the PMI. As Table 4.11-3 shows, both acute and chronic hazard indices are under the significance level of 1.0, and cancer risk is below the significance level of 10 in 1,000,000, indicating that no short- or long-term adverse health effects are expected.

TABLE 4.11-3
OPERATION HAZARD/RISK AT POINT OF MAXIMUM IMPACT

Type of Hazard/Risk	Hazard Index/Risk	Significance Level	Significant?
Acute Noncancer	0.089	1.0	No
Chronic Noncancer	0.00053	1.0	No
Individual Cancer	1.11 in one million	10 in one million	No

SOURCE: Table DR-PH-159-1 of applicant's data response set 1 (AECOM2010a).

Thorough evaluation of the risk assessment was conducted and the results are presented in the BSPP AFC (09-AFC-6) and in the "Responses to CEC Staff Public Health Data Requests 157-164" (January 2010) in order to determine if the Applicant's modeling results are transparent, verifiable, and accurate. Modeling files provided by the Applicant also were reviewed. It has been determined that standard procedures were followed and appropriate assumptions were made in the Applicant's analysis of potential health risks and, therefore, that the conclusions of impacts on public health being less than significant are based on a verifiable and appropriate Human Health Risk Assessment.

Construction Phase Analysis

For the construction phase analysis, atmospheric dispersion modeling of DPM emissions from construction equipment and vehicles was conducted by the Applicant using the OFFROAD2007 Model. Total estimated on-site PM emissions from diesel construction equipment exhaust over the estimated six-year construction period was provided in the January 2010 data responses and is 33,513 pounds. The corresponding annual DPM emission rate for exhaust emissions from onsite construction equipment and vehicles is expected to be 479 pounds per year (lb/yr) for residential exposure over a 70 year lifetime.

The maximum predicted offsite cancer risk due to diesel exhaust emissions was reported by the Applicant to be 2.97 in a million, based on the diesel cancer inhalation unit risk of 0.0003 $(ug/m^3)^{-1}$. Chronic HI was determined to be 0.0018 (non-cancer chronic REL is 5 ug/m^3). The maximum impacted receptor is located on the eastern fenceline of the site.

Operations-related Risks to Public Health

For the operations-phase analysis, atmospheric dispersion modeling of facility emissions was conducted by the Applicant using AERMOD. Local meteorological data were used, building downwash effects were included for 27 buildings, and 1,837 grid receptors were modeled.

A total of 36 emitting units were modeled by the Applicant for facility operations including:

a. 4 auxiliary boilers

b. 8 cooling tower stacks

c. 4 HTF (heat transfer fluid) heaters

d. 4 ullage system vents

e. 4 diesel emergency generators

f. 4 diesel firewater pumps

g. Mobile sources involved in routine operations (e.g., mirror washing trucks, trucks used in weed abatement, trucks used in application of soil stabilizer, water trucks)

h. Total of 36 emitting sources evaluated at the proposed facility.

The HTF (heat transfer fluid) would be circulated through the solar field where it would be heated by sunlight concentrated on the receiver tube elements of the solar collectors. HTF is comprised biphenyl/diphenyl oxide. Thermal decomposition of HTF results in decomposition products that can include benzene, phenol and toluene. In modeling HTF fugitive loss emissions, the Applicant assumed that 99 percent of the emissions would be comprised of benzene.

The HARP On-Ramp program was used to load the Applicant's AERMOD results into the CARB/OEHHA Hotspots Analysis and Reporting Program (HARP), Version 1.4a for the risk analysis. Exposure pathways assessed include inhalation, ingestion of home-grown produce, dermal absorption, soil ingestion and mother's milk. Emission factors obtained from the Applicant's modeling files and used in this analysis are listed in Table 4.11-4. For risk calculations using the HARP model, the "Derived (Adjusted) Method" was used for cancer risk and the "Derived (OEHHA) Method" was used for chronic non-cancer hazard.

Cancer risk and chronic and acute hazard index values are compared to results reported by the Applicant in the January 2010 response to CEC data requests in Table 4.11-5. Risk and hazard were determined at the PMI under the 70 year residential scenario, located on the eastern fenceline. There is a residential development approximately 2.1 miles south of the site and a mobile home is located approximately 725 feet east of the site, although specific modeling of this neighborhood and mobile home was not presented by the Applicant. No sensitive receptors were identified within three miles of the site.

Table 4.11-6 presents substance- and source-specific cancer risks at the PMI. Analysis of this table indicates that 91 percent of the cancer risk at the PMI is attributed to emissions from two sources: 81 percent due to emissions from the HTF ullage system and 10 percent due to emissions from the emergency diesel generator. Additional analysis indicates that 98 percent of cancer risk at the PMI is attributed to emissions of two substances: 81 percent due to benzene emissions (from the auxiliary boiler, the HTF heater and ullage system) and 17 percent due to DPM emissions (from onsite mobile sources as well as the two diesel engines).

Cooling Towers

One small wet cooling tower for each power block is proposed by the Applicant to cool ancillary equipment. In addition to being a source of potential TACs, 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 man-made water systems. It is the principal cause of legionellosis, otherwise known as Legionnaires' Disease, which is similar to pneumonia. Transmission to people results mainly from inhalation or

TABLE 4.11-4
OPERATION-PHASE EMISSION RATES

Substance	Annual Average Emissions (lbs/year)	Maximum 1-Hour Emissions (lbs/hour)
Emission Rates from Each of 4 Auxiliary Boilers		
Benzene	1.14E-01	7.00E-05
DiClBenzenes	6.50E-02	4.00E-05
Formaldehyde	4.06E+00	2.50E-02
Hexane	9.75E+01	6.00E-02
Naphthalene	3.30E-02	2.00E-05
Toluene	1.84E-01	1.13E-04
PAHs-w/o	3.23E-03	2.00E-06
Emission Rates from Each of 8 Cooling Tower Cells		
Chloroform	5.60E+01	1.50E-02
Hex Chrome	2.47E-05	6.68E-09
Copper	2.46E-04	6.65E-08
Vanadium	1.33E-04	3.60E-08
Zinc	6.05E-03	1.64E-06
Emission Rates from Each of 4 HTF Heaters		
Benzene	3.50E-02	7.00E-05
DiClBenzenes	2.00E-02	4.00E-05
Formaldehyde	1.25E+00	2.50E-02
Hexane	3.00E+01	6.00E-02
Naphthalene	1.00E-02	2.00E-05
Toluene	5.70E-02	1.13E-04
PAHs-w/o	9.93E-04	2.00E-06
Emission Rates from Each of 4 Ullage System Vents		
Benzene	3.00E+02	7.50E-01
Biphenyl	3.00E-02	7.50E-05
Emission Rates from Operation of each of 4 Emergency Generators		
Diesel PM	48.3	-
Emission Rates from Operation of Each of 4 Emergency Fire Pumps		
Diesel PM	4.96	-
Emission Rates from On-Site Maintenance Vehicles		
Diesel PM	0.64 – 1.16	-

SOURCE: CEC RSA (June 2010) Public Health Table 5.

TABLE 4.11-5
CANCER RISK AND CHRONIC HAZARD DUE TO OPERATION PHASE EMISSIONS

	EIS Analysis			Applicant's Analysis		
	Cancer Risk (per million)	Acute HI	Chronic HI	Cancer Risk (per million)	Acute HI	Chronic HI
PMI (for cancer risk and chronic HI, Rec#1342)	1.12	0.082	0.00053	1.11	-	0.00053
PMI (acute HI, Rec#1730)	0.94	0.089	0.00038	-	0.089	-
MEIR (Rec #89)	0.35	0.044	0.00013	0.35	0.044	0.00013

Cancer PMI (point of maximum impact, Rec. #1342) is located on the eastern fenceline.

SOURCE: CEC RSA June 2010 Public Health Table 6.

TABLE 4.11-6
RESULTS OF ANALYSIS: CONTRIBUTION TO TOTAL CANCER RISK BY INDIVIDUAL SUBSTANCES FROM ALL SOURCES AT THE POINT OF MAXIMUM IMPACT (PMI)

Substance	Auxiliary Boilers (4 units)	Cooling Tower (8 stacks)	Diesel Generator (4 units)	Diesel Firewater Pump (4 units)
DieselExhPM			1.13E-07	3.50E-08
Benzene	5.09E-11			
Chloroform		1.06E-08		
Cr(VI)		1.25E-10		
Formaldehyde	3.80E-10			
Naphthalene	1.76E-11			
PAHs-w/o	8.11E-09			
Total	***8.56E-09***	***1.07E-08***	***1.13E-07***	***3.50E-08***

Substance	HTF Heater (4 units)	Ullage System (4 sources))	On-site Mobile Sources (8 sources)	Total Cancer Risk
DieselExhPM			4.34E-08	1.91E-07
Benzene	1.57E-11	9.07E-07		9.07E-07
Chloroform				1.06E-08
Cr(VI)				1.25E-10
Formaldehyde	1.18E-10			4.98E-10
Naphthalene	5.37E-12			2.30E-11
PAHs-w/o	2.50E-09			1.06E-08
Total	***2.64E-09***	***9.07E-07***	***4.34E-08***	***1.12E-06***

SOURCE: CEC RSA June 2010 Public Health Table 7.

aspiration of aerosolized contaminated water. Untreated or inadequately treated cooling systems, such as industrial cooling towers and building heating, ventilating, and air conditioning systems, have been correlated with outbreaks of legionellosis.

Legionella can grow symbiotically with other bacteria and can infect protozoan hosts. This provides Legionella with protection from adverse environmental conditions, including making it more resistant to water treatment with chlorine, biocides, and other disinfectants. Thus, if not properly maintained, cooling water systems and their components can amplify and disseminate aerosols containing Legionella.

The State of California regulates recycled water for use in cooling towers in Title 22, Section 60303 of the California Code of Regulations. This section requires that, in order to protect workers and the public who may come into contact with cooling tower mists, chlorine or another biocide must be used to treat the cooling system water to minimize the growth of Legionella and other micro-organisms. This regulation does not apply to the BSPP since the proposed action intends to use groundwater supplied from on-site wells; however, the potential remains for Legionella growth in cooling water at the BSPP due to nutrients found in groundwater.

The USEPA published an extensive review of Legionella in a human health criteria document (USEPA 1999). The USEPA noted that Legionella may propagate in biofilms (collections of microorganisms surrounded by slime they secrete, attached to either inert or living surfaces) and that aerosol-generating systems such as cooling towers can aid in the transmission of Legionella from water to air. The USEPA has inadequate quantitative data on the infectivity of Legionella in humans to prepare a dose-response evaluation. Therefore, sufficient information is not available to support a quantitative characterization of the threshold infective dose of Legionella. Thus, the presence of even small numbers of Legionella bacteria presents a risk - however small - of disease in humans.

In February of 2000 the Cooling Technology Institute (CTI) issued its own report and guidelines for the best practices for control of Legionella (CTI 2000). The CTI found that 40-60 percent of industrial cooling towers tested were found to contain Legionella. More recently, a 2005 report of testing in cooling towers in Australia that found the rate of Legionella presence in cooling tower waters to be extremely low, approximately three to six percent. The cooling towers all had implemented aggressive water treatment and biocide application programs.

To minimize the risk from Legionella, the CTI noted that consensus recommendations included minimization of water stagnation, minimization of process leads into the cooling system that provide nutrients for bacteria, maintenance of overall system cleanliness, the application of scale and corrosion inhibitors as appropriate, the use of high-efficiency mist eliminators on cooling towers, and the overall general control of microbiological populations.

Good preventive maintenance is very important in the efficient operation of cooling towers and other evaporative equipment (ASHRAE 1998). Preventive maintenance includes having effective drift eliminators, periodically cleaning the system if appropriate, maintaining mechanical components in working order, and maintaining an effective water treatment program with

appropriate biocide concentrations. Most water treatment programs are designed to minimize scale, corrosion, and biofouling and not to control Legionella.

The efficacy of any biocide in ensuring that bacterial and in particular Legionella growth, is kept to a minimum is contingent upon a number of factors including but not limited to proper dosage amounts, appropriate application procedures and effective monitoring.

Alternatives

Reconfigured Alternative

If the Reconfigured Alternative were selected, a utility-scale solar energy generating facility would be developed on the site that would have the same generating capacity as the proposed action. Types and amounts of hazardous materials would be substantially similar to the proposed action. Compliance with applicable LORS and implementation of standard engineering and administrative controls to prevent and control accidental releases of hazardous materials would be expected. Consequently, attendant public health and safety risks would be comparable.

Reduced Acreage Alternative

If the Reduced Acreage Alternative were selected, a utility-scale solar energy generating facility would be developed on the site that would have approximately 25 percent less generating capacity as the proposed action (because of the development of three, instead of four, Units). Types of hazardous materials would be substantially similar to the proposed action, although the amounts required would be less, commensurate with the reduction by one Unit. As a result, attendant public health and safety risks would be slightly reduced.

No Action Alternative A

If No Action Alternative A were selected, there would be no direct or indirect impacts on public health and safety relating to hazardous materials, because the requested ROW application would be denied, no ROW grant authorized, and no amendment of the CDCA Plan would be approved to associate the site with solar energy development at this time. In this case, no cumulative impacts presently would be caused or contributed to under this alternative.

However, No Action Alternative A leaves open the possibility that a subsequent renewable energy facility application could be submitted that would be similar to, greater or less than, the proposed action. Depending on the technology proposed, different hazardous materials impacts could result. For example, if “power tower” or PV were proposed for a solar project instead of solar trough technology, no impacts relating the proposed HTF would result because no HTF would be required. Risks and hazards relating to accidents and spills, human health, small quantity hazardous materials, natural gas, construction risks and emissions could be similar to the proposed action.

No Action Alternative B

If No Action Alternative B were selected, there would be no direct or indirect impacts on public health and safety relating to hazardous materials, because the requested ROW application would

be denied, no ROW grant authorized, and the CDCA Plan would be amended to identify the site as unsuitable for any type of solar energy development. No cumulative impacts would be caused or contributed to under this alternative.

No Action Alternative C

If No Action Alternative C were selected, there would be no direct or indirect impacts on public health and safety relating to hazardous materials, because the requested ROW application would be denied, no ROW grant authorized. In this case, no cumulative impacts presently would be caused or contributed to under this alternative.

However, under No Action Alternative C, the CDCA Plan would be amended to identify the site as suitable for any type of solar energy development. Accordingly, hazardous materials impacts associated with No Action Alternative C would depend on the solar technology proposed, size of the project and other variables. Impacts similar in nature to those of the proposed action could be expected to result from risks and hazards relating to accidents and spills, human health, small quantity hazardous materials, large quantity hazardous materials, construction and emissions. Such impacts could be similar to, greater or less than those of the proposed action.

4.11.2.3 Discussion of Cumulative Impacts

Impacts resulting from construction, operation, maintenance and decommissioning of the BSPP could result in a cumulative impact relating to hazardous materials, including the use, storage, and transport of hazardous materials, with other past, present, or reasonably foreseeable future actions. For example, cumulative impacts would exist or could result from the interaction of one or more controlled or uncontrolled release of hazardous materials, e.g., airborne or subsurface plumes, within the same geographic area, and during the same timeframe. The geographic area of the cumulative impacts analysis area for hazardous materials management is the general project area, including the sites and the vicinity of the sites. BLM has identified this geographic area as large enough to provide a reasonable basis for evaluating cumulative hazardous materials-related impacts. The relevant timeframe within which incremental impacts could be additive, synergistic or otherwise combine includes the construction period for the proposed action, its anticipated 30-40 year lifespan and the period of time required for closure and decommissioning of the BSPP and alternatives.

Existing conditions within the cumulative impacts area reflect a combination of the natural condition and the effects of past actions and are described in the PA/FEIS Chapter 3. Direct and indirect effects of the BSPP are analyzed above. Past, present and reasonably foreseeable future actions making up the cumulative scenario are identified in Section 4.1.

Relevant past actions include one existing combined-cycle natural gas power plant (i.e., the Blythe Energy Project), two prisons, and other facilities that would continue to manage hazardous materials in the cumulative impacts area during the relevant timeframe. It is expected that these facilities use, store, and/or transport hazardous materials, including aqueous ammonia to control the emissions of NOx in the case of the Blythe Energy Project. However, these facilities are not

expected to contribute incremental hazardous materials management-related impacts that could overlap with those of the proposed action within the cumulative impacts area during the relevant timeframe, thereby causing or contributing to a cumulative effect, because they are subject to myriad safeguards, including the laws, ordinances, regulations, and standards (LORS) summarized in Table 1-1, which are intended to prevent uncontrolled releases and to control such releases in the event they occur.

In addition to the proposed action, other future foreseeable actions include 12 solar power plants planned along I-10, including the proposed Palen and Genesis solar projects, a combined-cycle natural gas power plant (i.e., Blythe Energy Project II), a communication tower, Eagle Mountain Pumped Storage Project, Eagle Mountain Landfill, a raceway, and several electric transmission infrastructure projects. Five of the 12 solar plants would be thermal and seven would be photovoltaic. Construction of the proposed thermal power plants would cause increases similar to the proposed action in the volume of heat transfer fluid and other hazardous materials required for the operation of such plants within the cumulative impacts area. These facilities would require the use, storage, and transport of various types of hazardous materials. Additional hazardous materials management is expected to occur at these facilities; however, these facilities are not expected to contribute incremental hazardous materials management-related impacts that could overlap with those of the proposed action within the cumulative impacts area during the relevant timeframe, thereby causing or contributing to a cumulative effect, because each such facility would be subject to the LORS and other safeguards that would prevent uncontrolled releases and to control such releases in the event they occur.

Collectively, the impacts associated with the construction, operation and maintenance, and closure and decommissioning of the BSPP and alternatives is not expected to cause or contribute to cumulative effects relating to hazardous materials management because of the nature of the materials used, compliance with applicable LORS and the engineering and administrative controls that would be implemented to prevent and control accidental releases of hazardous materials. Accordingly, it is unlikely that that a vapor or groundwater plume would mingle (combine) to produce an airborne or waterborne risk to the human environment should an accidental release occur.

4.11.2.4 Summary of Mitigation Measures

The implementation of the mitigation measures imposed by the Energy Commission as Conditions of Certification for the BSPP also would avoid or reduce impacts on the quality of the human environment. These mitigation measures are set forth in Appendix G. The following address impacts on public health and safety:

HAZ-1, HAZ-2, HAZ-3, HAZ-4, HAZ-5, HAZ-6

Public Health-1

SOIL&WATER-18

4.11.2.5 Residual Impacts after Mitigation Measures were Implemented

Although unlikely, it is possible that even after the implementation of the Mitigation Measures identified above, an accidental release could occur and could cause an airborne or waterborne risk to the human environment.

4.11.2.6 Unavoidable Adverse Impacts

Unavoidable adverse impacts would be the same as the residual impacts described above.

4.11.3 Non-hazardous Waste Management

This section presents an analysis of issues associated with wastes generated from the construction, operation and closure/decommissioning of the proposed action. The technical scope of this analysis encompasses solid and liquid wastes existing on site and wastes that would likely be generated during facility construction, operation and closure/decommissioning. Management and discharge of wastewater is addressed in the *Water Resources* section of this document. Additional information related to waste management may also be covered in the *Worker Safety* and *Hazardous Materials Management* sections of this document.

4.11.3.1 Impact Assessment Methodology

Projected wastes were evaluated in terms of landfill capacity and LORS compliance. The federal, state, and local environmental LORS listed in Table 1-1 have been established to ensure the safe and proper management of both solid and hazardous wastes in order to protect human health and the environment.

4.11.3.2 Discussion of Direct and Indirect Impacts

Proposed Action

Construction activities would generate an estimated 70 cubic yards per week of non-hazardous solid wastes, consisting of scrap wood, concrete, steel, glass, plastic, paper, insulating materials, aluminum, and food waste. For all construction waste, recyclable materials would be separated and removed to recycling facilities; non-recyclable materials would be disposed of at a Class III landfill.

Non-hazardous liquid wastes would be generated during construction, and would include storm water runoff, sanitary waste, dust suppression drainage, and equipment wash water. Storm water runoff would be managed in accordance with appropriate LORS. Sanitary wastes would be pumped to tanker trucks by licensed contractors for transport to a sanitary water treatment plant. Potentially contaminated equipment wash water would be contained at designated wash areas and transported to a wastewater treatment facility via a licensed hauler. Please see the *Water Resources* section of this document for more information on the management of project wastewater.

Site preparation and construction of all four phases of the BSPP would last approximately 69 months and generate non-hazardous, universal, and hazardous wastes in solid and liquid

forms. Before construction begins, the Applicant would develop and implement a Construction Waste Management Plan to ensure that waste is recycled when possible and properly landfilled as necessary. Mitigation Measure WASTE-4 would require the project owner to submit the Construction Waste Management Plan to the BLM and Energy Commission at least 30 days prior to the start of construction activities.

Anticipated universal waste generated during construction would include spent batteries (e.g., alkaline dry cell, nickel-cadmium, and lithium ion) and empty or nonempty aerosol cans. Estimated quantities are 70 spent batteries (in 69 months) and eight drums of aerosol cans (per year). Spent batteries and aerosol cans would be recycled by licensed universal waste handlers.

Alternatives

Reconfigured Alternative

If the Reconfigured Alternative were selected, a utility-scale solar energy generating facility would be developed on the site that would have the same generating capacity as the proposed action. Types and amounts of non-hazardous solid and liquid wastes would be substantially similar to the proposed action. Compliance with applicable LORS would be expected. Consequently, attendant public health and safety risks would be comparable to the proposed action.

Reduced Acreage Alternative

If the Reduced Acreage Alternative were selected, a solar energy generating facility would be developed on the site that would generate non-hazardous solid and liquid waste similar to, but approximately 25 percent less than, the proposed action. Consequently, public health and safety risks would be similar to, but slightly less than, the proposed action.

No Action Alternative A

If No Action Alternative A were selected, there would be no direct or indirect impacts on public health and safety relating to non-hazardous waste, because the requested ROW application would be denied, no ROW grant authorized, and no amendment of the CDCA Plan would be approved to associate the site with solar energy development at this time. In this case, no cumulative impacts presently would be caused or contributed to under this alternative.

However, No Action Alternative A leaves open the possibility that a subsequent renewable energy facility application could be submitted that would be similar to, greater or less than, the proposed action. Solid and liquid wastes of such a project could be similar to, greater or less than, the proposed action.

No Action Alternative B

If No Action Alternative B were selected, there would be no direct or indirect impacts on public health and safety relating to non-hazardous solid and liquid waste, because the requested ROW application would be denied, no ROW grant authorized, and the CDCA Plan would be amended to identify the site as unsuitable for any type of solar energy development. No cumulative impacts would be caused or contributed to under this alternative.

No Action Alternative C

If No Action Alternative C were selected, there would be no direct or indirect impacts on public health and safety relating to non-hazardous waste. No cumulative impacts presently would be caused or contributed to under this alternative. However, under No Action Alternative C, the CDCA Plan would be amended to identify the site as suitable for any type of solar energy development. Accordingly, solid and liquid waste-related impacts associated with No Action Alternative C would depend on the solar technology proposed, size of the project and other variables. Resulting impacts could be similar to, greater or less than those of the proposed action.

4.11.3.3 Discussion of Cumulative Impacts

Cumulative impacts can occur within 1-10/Eastern Riverside County area if implementation of the BSPP could combine with those of other local or regional projects. Cumulative impacts could also occur as a result of development of some of the many proposed solar and wind development projects and other non-energy projects that have been or are expected to be under consideration by the BLM, the Energy Commission and Riverside County during the life of the proposed action, from construction to decommissioning. Many of these projects are located within the California Desert Conservation Area, as well as on BLM land.

The geographic extent for the analysis of the cumulative impacts associated with the BSPP project is Riverside County, the location of the closest large Class III landfills. This geographic scope is appropriate because waste disposal facilities in Riverside County are the ones most likely to be used for disposal of waste generated by the BSPP considering regulatory acceptability and transport costs.

Existing waste management-related conditions within the cumulative impacts area reflect a combination of the natural condition and the effects of past actions and are described in PA/FEIS Chapter 3. Direct and indirect effects of the BSPP, including those associated with the generation of non-hazardous solid waste that would add to the total waste generated in Riverside County, are analyzed above. Past, present and reasonably foreseeable future actions making up the cumulative scenario are identified in Section 4.1. Non-hazardous solid waste generated by past, present, and reasonably foreseeable projects in the cumulative impacts area during the relevant timeframe is summarized in Table 4.11-7, below, and Table 4.1-4, Existing Projects Along the I-10 Corridor (Eastern Riverside County) and also would be disposed of within Riverside County. Most of the reasonably foreseeable projects identified Table 4.1-4 would generate smaller volumes of non-hazardous waste than the BSPP.

4.11.3.4 Cumulative Impacts in the Project Area

A value of 100 cubic yards/MW was used as a rough guide for determining total volume of non-hazardous solid wastes that could result from implementation of all the projects listed in the two tables. Solar projects dominate the list and would generate the most waste. The 100 cubic yards/MW value is based on the 1,000-MW BSPP project total lifetime value of 115,000 cubic yards of non-hazardous solid waste and factors in the lesser amounts of waste likely to be generated by solar photovoltaic projects. Similar to the proposed projects, these quantities do not include closure or decommissioning wastes; disposal at landfills with adequate capacity would be a

TABLE 4.11-7
SUMMARY OF OPERATION WASTE STREAMS AND MANAGEMENT METHODS

Waste Stream and Classification[a]	Origin and Composition	Estimated Amount	Estimated Frequency of Generation	Waste Management Method	
				Onsite	Offsite
Used hydraulic fluid, oils and grease – Non-RCRA hazardous	HTF system, turbine, and other hydraulic equipment	200,000 gallons per year	Intermittent	Accumulated for < 90 days	Recycle
Effluent from oily water separation system – Non-RCRA hazardous	Plant wash down area/oily water separation system	12,000 gallons per year	Intermittent	None	Recycle
Oil absorbent, and oil filters – Non-RCRA hazardous	Various	20 55-gallon drums per month	Intermittent	Accumulated for < 90 days	Sent offsite for recovery or disposal at Class I landfill
Dirty shop rags – Recyclable material	Maintenance cleaning operations	200 pounds per month	Routine	None	Send to commercial laundry for cleaning and recycling
Spent carbon – RCRA hazardous	Spent activated carbon from air pollution control of HTF vent	182,000 pounds per year	Intermittent	Contained in engineered process vessel, no accumulation outside of process	Sent off site for regeneration at a permitted management facility
Soil contaminated with HTF (< 10,000 mg/kg) – Non-hazardous	Solar array	3,000 cy/year	Intermittent	Bioremediation or land farming at LTU	Disposal at permitted waste management facility
Spent batteries – Universal waste	Batteries containing heavy metals such as alkaline dry cell, nickel-cadmium, or lithium ion.	<40/month	Continuous	Accumulate for <one year	Recycle
Spent batteries – Hazardous (exempt if managed as prescribed by Title 22 CCR Chapter 16).	Lead acid	80 every two years	Intermittent	Accumulated for <180 days	Recycle
Spent fluorescent bulbs or high-intensity discharge lamps – Universal waste	Facility lighting	< 200 per year	Intermittent	Accumulate for <one year	Recycle
Spent demineralizer resin – Non-hazardous	Demineralizer	1,000 cubic feet (ft^3)	Once every three years	None	Recycle
Reverse Osmosis (RO) Membrane Cleaning Waste – Non-hazardous	Acidic and/or caustic chemicals	12,000 to 24,000 gallons per cleaning	Up to four times per year	Evaporation ponds	Evaporation Pond solids disposal at permitted waste management facility
RO system concentrate – Inert or liquid designated waste – Non-hazardous	Auxiliary cooling tower and boiler blowdown	TBD	Routine	Evaporation ponds	Evaporation Pond solids disposal at permitted waste management facility
Auxiliary cooling tower basin sludge – Non-hazardous	Auxiliary cooling tower	4,000 pounds/ year	Annually	Evaporation ponds	Evaporation Pond solids disposal at permitted waste management facility
Spent softener resin – Non hazardous	Softener	2,000 ft^3	Once every 3 years	None	Recycle
Damaged parabolic mirrors – Non-hazardous	Metals and other materials	TBD	Variable	None	Recycle for metal content and/or other materials or send for landfill disposal
Sanitary wastewater – Non-hazardous	Toilets, washrooms	11,000 gallons/ day	Continuous	Septic leach field	None

NOTE:
[a] Classification under Title 22 CCR Division 4.5, Chapters 11, 12, and 23.

condition in facility closure plans. The approximately 450,000 cubic yards generated from projects in the cumulative scenario within the cumulative impacts area compares to the 150,000,000 cubic yards of Riverside County Class III landfill capacity available to these generators as indentified in AFC Table 5.16-4 (Solar Millennium 2009a, page 5.16-10, 11). The non-hazardous waste generated by the BSPP would not result in cumulatively significant adverse effects to waste management.

As stated above, the non-recyclable component of the 3,500 cubic yards of total lifetime hazardous waste from the BSPP would not impact the capacity or remaining life of the Class I waste facilities. Using a similar conversion factor as that noted above, it was estimated that approximately 16,000 cubic yards of lifetime hazardous waste would be generated by the projects in the cumulative scenario within the cumulative impacts area. This compares to the almost 10,000,000 cubic yards of Class I landfill capacity available to these generators as indentified in AFC Table 5.16-4 (Solar Millennium 2009a, page 5.16-10, 11).

4.11.3.5 Cumulative Impacts in the California Desert

Implementation of the multiple solar and wind projects proposed to be developed in the California Desert, and other planned non-energy projects, would result in an increase in generation of hazardous and non-hazardous solid and liquid waste and would add to the total quantity of waste generated in throughout the desert. However, BSPP-specific wastes would be recycled wherever practical and sufficient capacity is available throughout the area, especially with the addition of the Mesquite Regional Landfill with a capacity of 600 million tons and scheduled to be fully operational in 2011/2012 (Mesquite Regional Landfill 2010). Therefore, impacts of the BSPP, when combined with impacts of the future solar and wind, and other development projects currently proposed within the California desert would not result in significant adverse and unavoidable cumulative impacts with regard to waste management.

In sum, incremental impacts of the BSPP could combine with impacts of past, present, and reasonably foreseeable projects to result in a contribution to local and regional cumulative impacts related to waste management. The amount of non-hazardous and hazardous wastes generated during construction, operation and closure/decommissioning of the BSPP project would add to the total quantity of hazardous and non-hazardous waste generated in Riverside County. However, sufficient capacity is available at treatment and disposal facilities to handle the volumes of wastes that would be generated by the combined projects. The impacts for the alternatives would vary, and be proportional to the size of the project.

4.11.3.6 Summary of Mitigation Measures

Implementation of the mitigation measures imposed by the Energy Commission as Conditions of Certification for the BSPP also would avoid or reduce impacts on the quality of the human environment. These mitigation measures are set forth in Appendix G. The following address impacts on hazardous waste:

> WASTE-1, WASTE-2, WASTE-3, WASTE-4, WASTE-5, WASTE-6, WASTE-7, WASTE-8, WASTE-9, WASTE-10

4.11.3.7 Residual Impacts after Mitigation Measures were Implemented

None are expected.

4.11.3.8 Unavoidable Adverse Impacts

None are expected.

4.11.4 Unexploded Ordnance (UXO)

UXO presents an immediate risk of acute physical injury from fire or explosion resulting from accidental or unintentional detonation. As discussed in Section 3.12, unidentified UXO could be present on the site or along the access routes or the existing or proposed corridors of the power lines or natural gas lines.

4.11.4.1 Impact Assessment Methodology

Review of historical uses of the site, generally-accepted risk information that is widely-available from a multitude of internet sources, and analysis included in the Energy Commission's Revised Staff Assessment all contributed to the analysis of potential UXO-related impacts associated with development of the proposed action.

4.11.4.2 Discussion of Direct and Indirect Impacts

Proposed Action

During construction, maintenance, and closure and decommissioning activities associated with the Proposed Action, land disturbance activities could unearth unexploded World War II-era and more recent vintage munitions, including conventional and unconventional land mines, personnel mines, and bullets, the detonation of which would pose a safety risk to the construction workers. For example, surface and shallow sub-surface UXO could be disturbed by vehicles, walkers and excavation using shovels or similar hand tools, and deeper sub-surface UXO could be disturbed by the earth movement and excavation processes that would be required for development of the proposed action and action alternatives.

Alternatives

Action Alternatives and No Action Alternatives A and C

Risks associated with accidental or unintentional detonation of UXO would be equally applicable for all of the alternatives pursuant to which ground disturbance could occur consistent with the CDCA Plan, including No Action Alternatives A and C, regardless of whether such disturbance related to the development of a renewable energy project.

No Action Alternative B

Because the selection of Alternative B would not be expected to result in ground disturbance, no UXO-related risks are anticipated to be associated with this alternative.

4.11.4.3 Discussion of Cumulative Impacts

Although accidental or unintentional detonation of UXO in the vicinity of the proposed action constitutes a continuing risk of immediate, acute physical injury from fire or explosion, the incremental UXO-related risks of projects in the cumulative scenario could not combine in a way that would be additive, countervailing or synergistic. Consequently, there would be no significant UXO-related cumulative impacts associated with the proposed action.

4.11.4.4 Summary of Mitigation Measures

BLM-PHS-1: To protect against UXO-related hazards, the potential presence of UXO should be investigated in geophysical surveys performed by a company with specific expertise in UXO identification, and remnants of munitions or bullets identified during development of the subject property should be removed and disposed of in accordance with applicable LORS (AECOM, 2009).

4.11.4.5 Residual Impacts after Mitigation Measures were Implemented

Even with the implementation of the Mitigation Measure identified above, a risk of accidental or unintentional detonation of UXO would remain, resulting in a continuing risk of immediate, acute physical injury from fire or explosion.

4.11.4.6 Unavoidable Adverse Impacts

Unavoidable adverse impacts would be the same as the residual impacts discussed above.

4.11.5 Abandoned Mined Lands (AML)

As discussed in Section 3.12, there are three AMLs in the vicinity of the site: two are located onsite, on public land, near the northwest corner of the BSPP area; the third is located on private land off-site, but near the southeast corner.

4.11.5.1 Impact Assessment Methodology

Review of United States Department of Labor, Mine Safety and Health Administration data, BLM's Abandoned Mine Land Program Policy Handbook (H-3720-1), and the Energy Commission's Revised Staff Assessment all contributed to the analysis of potential AML-related impacts associated with development of the proposed action.

4.11.5.2 Discussion of Direct and Indirect Impacts

Proposed Action

AMLs pose physical safety hazards, including injury and death, associated with the presence of deadly gases, lack of oxygen, explosives and toxic chemicals in the mine (including from illicit

drug labs); strandings, falls and all-terrain vehicle (ATV) flips, roll-overs and other crashes; encounters with wild animals, such as rattlesnakes or scorpions; exposure to diseases from bat droppings, hantavirus, radon and radiation; and exposure to toxic mine tailings and soil, water, and air contaminated with cyanide, lead, arsenic, mercury, and other toxins that could be inhaled through dust and particles or through contact with impounded acidic water. (BLM, 2007; MSHA, 2009a; MSHA, 2009b). BLM expects the potential risk for injuries and deaths at AML sites to increase as recreational use of public lands (including use of mountain bikes and OHVs) increases and members of the public, including construction workers, are increasingly in contact with heretofore isolated sites (BLM, 2007).

During construction, operation and maintenance, and closure and decommissioning of the BSPP, workers on site, and members of the public offsite (who may be drawn the project and then skirt its fence line) could intentionally or unintentionally access the AMLs and, thereby, be exposed to the above-described risks.

Alternatives

Action Alternatives

Risks associated with AMLs would apply equally to all of the action alternatives, including the proposed action, Reconfigured Alternative and Reduced Acreage Alternative, since each such alternative could attract workers or members of the public to or near the site.

No Action Alternatives

Such risks also could apply to the each of the No Action Alternatives in connection with pursuit of any of the use opportunities that would be available on the site consistent with the CDCA Plan, regardless of whether such uses ultimately involve a renewable energy project, to the extent that people could be attracted to the area near the AMLs. Slightly reduced risk could be expected to result under No Action Alternative B relative to the other alternatives, since preclusion of a renewable energy development on the site would be more likely to result in existing recreational users and other visitors to the site staying on established trails and paths. Greater risks and higher incidence of exposure to the AMLs could be expected to result commensurate with the likelihood that workers or visitors would veer from established paths in a way to brings them closer to the AML openings.

4.11.5.3 Discussion of Cumulative Impacts

Incremental AML-related impacts of the BSPP and alternatives could be cumulative if other projects in the cumulative scenario also attract people to the areas where these three AMLs are located during the lifespan (from construction to decommissioning) of the BSPP. The other projects identified in Section 4.1 as part of the cumulative scenario are not expected to attract people to the relevant areas. Consequently, AAML-related cumulative impacts are not expected to result.

4.11.5.4 Summary of Mitigation Measures

BLM-PHS-2: AML openings should be identified, flagged and avoided if they pose a physical safety hazard. The Applicant should coordinate with the BLM to identify any hazards with the openings on public land so that BLM may develop mitigation measures to avoid the sites or mitigate related hazards. Such mitigation measures shall be consistent with the BLM's Abandoned Mine Land Program Policy Handbook (H-3720-1) (BLM, 2007), as it may be amended from time to time, or with a comparable resource. The Applicant also shall coordinate with the owner of the site that appears to be on private land to mitigate any hazards associated with that opening.

4.11.5.5 Residual Impacts after Mitigation Measures were Implemented

None are expected.

4.11.5.6 Unavoidable Adverse Impacts

None are expected.

4.11.6 Undocumented Immigrants (UDI)

There are no known incidents with UDI at or near the BSSP site. Thus, no UDI-related direct or indirect impacts would result from the BSPP or alternatives, no mitigation measures would help the project and no cumulative impacts, residual impacts or unavoidable adverse impacts on UDI would result.

4.11.7 Transmission Line Safety and Nuisance

4.11.7.1 Impact Assessment Methodology

The potential magnitude of the line impacts of concern depends on compliance with the listed design-related LORS and industry practices (Table 1-1). These LORS and practices have been established to maintain impacts below hazard thresholds. Thus, if the proposed action would comply with applicable LORS, then it would remain below such thresholds.

4.11.7.2 Direct and Indirect Impacts

Proposed Action

This analysis focuses on the transmission line required to serve the generation facility, and addresses the following issues taking into account both the physical presence of the line and the physical interactions of its electric and magnetic fields:

1. aviation safety;
2. interference with radio-frequency communication;
3. audible noise;

4. fire hazards;
5. hazardous shocks;
6. nuisance shocks; and
7. electric and magnetic field (EMF) exposure.

The transmission line for the proposed action, the Reconfigured Alternative and the Reduced Acreage Alternative would follow the same route. The line would (a) be constructed, operated, and maintained according to SCE's guidelines for line safety and field management which conform to applicable LORS and (b) would traverse undisturbed desert land with no nearby residents, thereby eliminating the potential for residential electric and magnetic field exposures.

Since the line for the proposed action, Reconfigured Alternative and Reduced Acreage Alternative would be designed and operated according to the applicable SCE guidelines, there would be no difference in the magnitude of the field and nonfield impacts of concern in this analysis. This lack of difference would manifest itself regarding radio frequency communication, audible noise, hazardous and nuisance shocks, electric and magnetic field levels, fire hazards and aviation safety.

Aviation safety

An overhead 230-kV single circuit, three-phase transmission line and 52 steel monopoles, ranging from 90 feet to a maximum of 145 feet in height and spanning less than 10 miles, would proceed on a route directly south from the BSPP power block and eventually cross I-10 and turn westward to SCE's planned Colorado River Substation. Forty-three of the 52 monopoles are located in Blythe Airport Compatibility Zones, D, C, and B1.

Because the transmission line and poles could affect navigable airspace, the FAA requires the Applicant to file Form 7460-1 and 7460-2. In addition, because 43 monopoles would be located in airport compatibility zones, Riverside County ordinances would require that the project be reviewed by the Riverside County Airport Land Use Commission. The Applicant has thus submitted a "Notice of Proposed Construction and Alteration (Form 7460) for FAA's safety assessment (Solar Millennium 2009a p.5.14-6). The FAA conducted this safety analysis and concluded in a December 29, 2009 memorandum to the Applicant entitled "Determination of No Hazard to Air Navigation" that the proposed transmission line would not pose an aviation hazard to area aircraft.

On February 25, 2010, CEC staff met with staff and several members of the ALUC regarding the proposed action. As a result of that meeting, the ALUC sent a letter to the CEC indicating its major concerns regarding the potential hazards to flight for the Blythe Airport. Those hazards included the following:

1. Reflectivity and temporary flash occurrences;

2. Radio frequency emissions for electrical motors or other on-site equipment (transmission lines) and the potential for interference;

3. Height and velocity of thermal plumes from the dry cooling units;

4. Height and location of structures, including the dry cooling units and power poles and lines;

5. Provision of adequate open space within any portion of the project potentially within Compatibility Zone D; and

6. The cumulative impacts of additional hazards to flight considering the amount of existing and proposed solar (and conventional energy generating) facilities surrounding the Blythe Airport.

As of April 15, 2010, the FAA had reviewed 52 poles. Red lights were required on two poles located in Compatibility Zone D. In addition, a survey was required for five poles included in Zone D; two poles in Zone B1; one pole in Zone C; and for seven poles in Zone D. Also, the FAA noted that the transmission line is being revised south of I-10 and 12 poles would require a resubmittal of FAA Form 7460. The FAA also noted that additional poles also could require resubmittal of FAA Form 7460 depending on a land survey just completed and ultimate placement of individual poles.

Interference with Radio-Frequency Communication

The proposed action line would be designed, built and maintained in keeping with standard SCE practices that minimize surface irregularities and discontinuities and related corona noise. Such corona effects would further be minimized by the specific low-corona designs proposed by the Applicant. Since the line would traverse an uninhabited open space and would not interfere with modern digital air port-related communications, no interference-related complaints would be expected.

Audible Noise

Since the noise level depends on the strength of the line electric field, the potential for perception could be assessed from estimates of the field strengths expected during operation. Such noise is usually generated during rainfall, mainly from overhead lines of 345 kV or higher such as the proposed line. Research by the Electric Power Research Institute (EPRI 1982) has validated the efficacy of available mitigation measures by showing that the fair-weather audible noise from all modern transmission lines even of more than 345 kV would be generally indistinguishable from background noise at the edge of a right-of-way of 100 feet or more. Since the proposed low-corona design is also aimed against surface electric fields gradients, staff does not expect the operation of the proposed line to add significantly to current background noise levels in the project area. For an assessment of the noise from the proposed line and related facilities, please refer to the **Noise** section.

Fire Hazards

Potential fire hazards would be addressed through compliance with applicable LORS (Table 1-1). Such hazards would be caused by sparks from conductors of overhead lines, or could result from direct contact between the line and nearby trees and other combustible objects.

Hazardous and Nuisance Shocks

Operation of the proposed transmission line could result in hazardous and/or nuisance shocks. For the proposed line, the Applicant would be responsible in all cases for ensuring compliance with these grounding-related practices within the ROW.

Electric and Magnetic Field Exposure

While EMF hazards have not been established from the available evidence, the absence of such evidence does not serve as proof of a definite lack of a hazard. Therefore, it is appropriate, in light of present uncertainty, to recommend feasible reduction of such fields without affecting safety, efficiency, reliability, and maintainability of the proposed line.

Since the line for the proposed action and the Reconfigured Alternative would be designed and operated according to the applicable SCE guidelines, there would be no difference in the magnitude of the field and non-field impacts of concern in this analysis. This lack of difference would manifest itself regarding radio frequency communication, audible noise, hazardous and nuisance shocks, electric and magnetic field levels, fire hazards and aviation safety.

Alternatives

Action Alternatives

Construction and operation of the Reconfigured Alternative and the Reduced Acreage Alternative would have the same transmission line safety and nuisance impacts to those analyzed for the proposed BSPP since the transmission line under these alternatives would follow the same route.

No Action Alternatives A and C

Under No Action Alternative A, the Proposed Action would not be implemented, but the land on which the BSPP is proposed would become available to other uses that are consistent with BLM's land use plan, potentially including other renewable energy projects. Under No Action Alternative C, the Proposed Action would not be implemented, but BLM would allow for other solar projects on the site. Under these no action scenarios, other renewable energy projects may be constructed to meet state and federal mandates, and those projects would likely require transmission lines that would have similar transmission line safety and nuisance impacts to the proposed action.

No Action Alternative B

Under No Action Alternative B, the Proposed Action would not be implemented and BLM would make the area unavailable for future solar development. Under this no action scenario, it is expected that the site would remain in its existing condition, with no new structures or facilities constructed or operated on the site. However, it is possible that other uses consistent with the site's CDCA Plan classification could require transmission lines that would have similar transmission line safety and nuisance impacts to the proposed action.

4.11.7.3 Cumulative Impacts

Incremental impacts of construction, operation, maintenance and decommissioning of the BSPP could contribute to a cumulative effect on transmission line safety and nuisance when considered in combination with additional transmission lines that would be associated with the cumulative projects (see Section 4.1). The cumulative impacts area for potential cumulative transmission line safety and nuisance impacts would be limited to the immediate vicinity of the proposed line. The relevant timeframe within which incremental impacts could interact to cause or contribute to cumulative impacts would begin when the proposed line is erected and would last for as long as the line remains in place. This time period very likely could extend past the point of site closure and decommissioning of the BSPP.

Existing conditions within the cumulative impacts area reflect a combination of the natural condition and the effects of past actions and are described in FEIS chapter 3. Direct and indirect effects of the BSPP and alternatives are analyzed above. Past, present and reasonably foreseeable future actions making up the cumulative scenario are identified in Section 4.1. It is unlikely that transmission lines associated with the cumulative projects would be sited in the immediate vicinity of the transmission line of the proposed action. Therefore, cumulative impacts are not anticipated to result from the proposed action. None of the alternatives is expected to cause or contribute to any cumulative transmission line safety and nuisance impacts, because, if a line is built pursuant to the alternative, incremental impacts would be the same as those of the proposed action and, if no line is built, no line-related impacts would result.

Regarding EMF exposure, when field intensities are measured or calculated for a specific location, they reflect the interactive, and therefore, cumulative effects of fields from all contributing conductors. This interaction could be additive or countervailing, depending on prevailing conditions. Since the proposed action's transmission line would be designed, built, and operated according to applicable SCE field-reducing guidelines (as currently required by the CPUC for effective field management), any contribution to cumulative area exposures should be at levels expected for SCE lines of similar voltage and current-carrying capacity. The action alternatives would contribute to cumulative EMF conditions, as could No Action Alternative scenarios that might include a transmission line. If no transmission line were developed, pursuit of the alternative would not generate EMF.

4.11.7.4 Summary of Mitigation Measures

The implementation of the mitigation measures imposed by the Energy Commission as Conditions of Certification for the BSPP also would avoid or reduce impacts on the quality of the human environment. These mitigation measures are set forth in Appendix G. The following mitigation measures address impacts on transmission line safety and nuisance:

TLSN-1, TLSN-2, TLSN-3, TLSN-4, TLSN-5

4.11.7.5 Residual Impacts after Mitigation Measures were Implemented

None are expected.

4.11.7.6 Unavoidable Adverse Impacts

None are expected.

4.11.8 Traffic and Transportation Safety

4.11.8.1 Impact Assessment Methodology

The Traffic and Transportation Safety analysis focuses on:

1. Whether construction or operation of the BSPP would result in traffic and transportation safety impacts, including aviation safety.

2. Whether the BSPP would comply with applicable LORS (see Table 1-1).

In this analysis, potential impacts are identified related to the construction and operation of BSPP on the surrounding transportation systems and roadways and, when applicable, mitigation measures are proposed.

4.11.8.2 Direct and Indirect Impacts

Proposed Action

Aviation Safety

Construction, operation and decommissioning of the BSPP could affect the operation of the Blythe Airport because of its location in an airport compatibility zone. An aviation consultancy firm assisted with the assessment of impacts this proposed power plant on aviation safety and the general operations of Blythe Airport.

The BSPP includes four dry-cooling systems, including four 120-foot air-cooled condensers, one for each system. In addition, one component of one of BSPP's proposed dry-cooling systems, the power block, is located in Blythe Airport Compatibility Zone E. The air-cooled condenser itself is located approximately 135 feet outside Compatibility Zone E. Under certain ambient air conditions, all four air-cooled condensers could create upward plumes exceeding 14.1 feet per second (f/s), which is equivalent to 4.3 meters per second (m/s), at heights as much as approximately 1,670 feet above ground level (AGL). For the purposes of this analysis, it has been determined that a plume of 14.1 f/s velocity has the potential to affect aircraft operations.

The 14.1 f/s velocity threshold is based on a review of a 2004 safety circular AC 139-05(0) prepared by the Australian Government Civil Aviation Safety Authority. In that safety circular, the Australian Civil Aviation Authority noted "aviation authorities have established that an exhaust plume with a vertical velocity in excess of 4.3 meters per second (m/s) may cause

damage to an aircraft airframe or upset an aircraft when flying at low levels" (CASA 2004 as cited in the CEC RSA June 2010).

Solar facilities generally use one of three technologies designed to concentrate the sun's rays to generate heat, thereby creating electricity. Those three technologies consist of power towers, linear receiver tubes, and dish/engines. Together, plants that generate energy using any of those three technologies may be classified as concentrating solar plants. BSPP would be a concentrating solar plant that uses linear receiving tubes.

All three technologies introduced in the previous paragraph have the potential for creating glint and glare. *Glint* is defined as a momentary flash of light; *glare*, as a more continuous source of excessive brightness relative to the ambient lighting. Hazards from glint and glare from concentrating solar plants can range from permanent eye injury or retinal burn to temporary disability or distractions (flash blindness). These hazards could affect people working nearby or on the airport; pilots using or flying over the airport; or motorists driving on or to the airport property itself.

The BSPP would consist of approximately 5,600 acres of parabolic trough solar collector arrays installed immediately southeast of the airport. A parabolic trough, a type of a solar thermal energy collector, is constructed as a long parabolic mirror with a Dewar tube running its length at the focal point. Sunlight is reflected by the mirror and focused on the Dewar tube. The trough is usually aligned on a north-south axis and rotated to track the sun as it moves across the sky each day. Troughs are stowed facing the ground.

In addition, BSPP's proposed transmission lines and facility control systems would use specific electronic frequencies that could interfere with aircraft communications or avionics (radio frequency interference or RFI). FAA regulations and the Riverside County Airport Land Use Commission's Airport Land Use Compatibility Plan require minimization of electronic interference. Interference from electronic frequencies for the proposed transmission line as well as from the facility control systems has been mitigated by the specific low-corona or low electrical discharge designs proposed by the Applicant. In addition, the electrical wires needed to operate the facility control systems would be buried underground, thereby eliminating electrical interference.

The Applicant has proposed the addition of two, four-acre evaporation ponds, artificial bodies of water, to be located next to each of the four power blocks. The addition of those evaporation ponds will result in 32 acres of evaporation ponds, with at least one pond located in Blythe Airport Compatibility Zone D.

Evaporation ponds have the potential to attract birds, especially where natural water sources are scarce. When located on or near airports, those evaporation ponds can affect airport operations by attracting birds. The flying birds could become a hazard to aircraft, particularly during take-offs and landings, the most critical times of flight. During take-offs and landings, the presence of birds could obscure pilots' vision or result in other distractions that could cause pilots to lose control of their aircraft.

Roadway Safety

The direct and indirect traffic and transportation safety-related impacts of the proposed BSPP on the transportation system are examined in this section. Several pieces of equipment that exceed roadway load or size limits would need to be transported to the BSPP site via I-10 during construction, potentially resulting in a roadway hazard. This equipment includes the steam turbine generator and main transformers. The equipment would be transported using multi-axle trucks.

To transport the equipment, the Applicant must obtain special ministerial permits from Caltrans to move oversized or overweight materials. In addition, the Applicant must ensure proper routes are followed; proper time is scheduled for the delivery; and proper escorts, including advanced warning and trailing vehicles as well as law enforcement control are available, if necessary.

Hazardous materials to be used by the BSPP consist of heat transfer fluid (Therminol VP-1™) as well as diesel fuel, mineral insulating oil, and lube oil. Tanker trucks would use I-10 two times a month to make deliveries to the site. Federal and state regulations include specific procedures for transporting hazardous materials. See Table 1-1 for information about applicable LORS.

Alternatives

Action Alternatives

Construction and operation of the Reconfigured Alternative and the Reduced Acreage Alternative would have similar aviation and roadway safety impacts as those described for the proposed BSPP since the facilities under these alternatives would generally be the same, with only a minor reconfiguration of one solar unit or a 25 percent reduction in the overall acreage. Therefore, there would be no substantial change in impacts from an aviation and roadway safety perspective under these alternatives.

No Action Alternatives A and C

Under No Action Alternative A, the site would become available to other uses that are consistent with BLM's land use plan, including another solar project. Under No Action Alternative C, the Proposed Action would not be implemented and BLM would allow for other solar projects on the site. Under these no action scenarios, other renewable energy projects could be constructed to meet state and federal mandates, and those projects would likely require construction activities and facilities that would have similar aviation and roadway safety impacts to the proposed action.

No Action Alternative B

Under No Action Alternative B, the proposed action would not be implemented and BLM would make the area unavailable for future solar development. Under this no action scenario, it is expected that the site would remain in its existing condition, with no new structures or facilities constructed or operated on the site. However, other uses consistent with the CDCA Plan use classification could be developed on the site. Such other uses could cause similar, greater or lesser aviation and roadway safety impacts than the proposed action.

4.11.8.3 Cumulative Impacts

Incremental traffic and transportation-related safety impacts resulting from construction, operation, maintenance and decommissioning of the BSPP could result in a cumulative effect in combination with past, present, or reasonably foreseeable future actions. The cumulative impacts area for traffic and transportation-related safety consists of the I-10 corridor and airspace governed by the Riverside County Airport Land Use Commission's Airport Land Use Compatibility Plan, which establishes policies applicable to land use compatibility planning in the vicinity of airports throughout Riverside County. This geographic scope of cumulative impacts analysis was established based on the natural boundaries of the affected resources, i.e., where on-road traffic and transportation impacts of the proposed action could occur and where aviation safety could be affected not only above the Blythe Airport, but also above airports in the vicinity of the Blythe Airport. Potential cumulative effects on traffic and transportation safety could begin as soon as the earliest of the following events associated with the proposed action: installation-related testing of the proposed air-cooled condensers, installation of facilities that could cause glint or glare, or the occurrence of water within the evaporation ponds. This beginning point may not coincide precisely with the initiation of the construction period. The potential for cumulative impacts would persist for as long as these features are present, and could extend to the conclusion of the closure and decommissioning phase of the proposed action.

Existing conditions within the cumulative impacts area reflect a combination of the natural condition and the effects of past actions and are described in FEIS chapter 3. Direct and indirect effects of the BSPP and alternatives are analyzed above. Past, present and reasonably foreseeable future actions making up the cumulative scenario are identified in Section 4.1. Within the cumulative impacts area for traffic and transportation-related safety, there are 13 solar projects proposed along the I-10 corridor predominantly between Desert Center and Blythe. Based on the currently available data for these various projects (information obtained from Plans of Development and other project documents), and assuming all projects move forward, these projects would be under construction in the same general time frame as the proposed action (2011 to 2016). Other types of projects also could proceed during this timeframe and, thereby, affect the I-10 corridor and safety at and in the vicinity of the Blythe Airport.

Of these projects, two, in addition to the proposed action, are parabolic trough projects (i.e., the Palen Solar Power Project and Genesis Solar Energy Project). Each would be anticipated to contribute incremental impacts that are similar in type, duration and intensity as the proposed action.

Concerning potential cumulative impacts on aviation safety, aircraft approaching from or departing to the east fly over the existing Blythe Energy Project (see Table 9 Existing Projects along the I-10 Corridor (Eastern Riverside County). In addition, First Solar's Blythe (21 MW solar PV) is under construction (Blythe I), and Blythe Airport Solar I, a 100 MW solar photovoltaic energy facility to be built in 20-MW phases (Blythe II), is proposed for construction on 640 acres within an 829-acre area on the grounds of the Blythe Airport. The 640-acre facility would be located east of Runway 17-35 and to the north of Runway 8-26 in several airport compatibility zones. As a result, the construction and operation of the BSPP combined with

construction, operation and maintenance of these other projects at or near the airport could affect the operation of and aviation safety at the Blythe Airport because of their location in several airport compatibility zones. In addition, if Blythe II is constructed, the airport's traffic pattern will need to be changed as required by a condition of certification imposed by the Energy Commission when granting approval for the project in 2005. Several power plants are currently located or proposed for location within two miles of the Blythe Airport. Sixteen acres of evaporation ponds have been built at the Blythe Energy Plant I. In addition, the CEC has approved for construction a second plant, Blythe Energy Plant II, next to the existing Blythe Energy Plant I. The applicant for that project has applied to the Energy Commission for an extension to start construction by December 14, 2013. If Blythe II is constructed, a third evaporation pond would be added to that existing location. As a result, up to 56 acres of evaporation ponds could be located within two miles of the Blythe Airport. The evaporation ponds proposed as part of the BSPP would be netted and monitored to prevent birds from landing on them. However, this might not be enough to preclude the evaporation ponds from serving as an attractant to birds.

4.11.8.4 Summary of Mitigation Measures

The implementation of the mitigation measures imposed by the Energy Commission as Conditions of Certification for the BSPP also would avoid or reduce impacts on the quality of the human environment. These mitigation measures are set forth in Appendix G. The following mitigation measures address impacts on transportation and aviation safety:

TRANS-6, TRANS-7, TRANS-8, TRANS-9, TRANS-10, TRANS-11

4.11.8.5 Residual Impacts after Mitigation Measures were Implemented

None are expected.

4.11.8.6 Unavoidable Adverse Impacts

None are expected.

4.11.9 Worker Safety and Fire Protection

4.11.9.1 Impact Assessment Methodology

Two issues are assessed in Worker Safety-Fire Protection:

1. The potential for impacts on the safety of workers during demolition, construction, and operations activities, and

2. Fire prevention/protection, emergency medical response, and hazardous materials spill response during demolition, construction, and operations.

Worker safety issues are thoroughly addressed by Cal/OSHA regulations. If all LORS are followed, workers would be adequately protected.

Regarding fire prevention matters, the on-site fire-fighting systems proposed by the Applicant have been analyzed and the time needed for off-site local fire departments to respond to a fire, medical, or hazardous material emergency at the proposed power plant site. If on-site systems do not follow established codes and industry standards, additional measures would be recommended. The local fire department capabilities and response times in each area have been reviewed and interviews have been conducted with local fire officials to determine if they feel adequately trained, manned, and equipped to respond to the needs of a power plant.

4.11.9.2 Direct and Indirect Impacts

Proposed Action

Worker Safety

Industrial environments are potentially dangerous during construction and operation and maintenance, and closure and decommissioning of facilities. Workers at the proposed BSPP would be exposed to loud noises, moving equipment, trenches, and confined space entry and egress. The workers could experience falls, trips, burns, lacerations, and numerous other injuries. They could be exposed to falling equipment or structures, chemical spills, hazardous waste, fires, explosions, or electrical sparks and electrocution.

Other workplace hazards that could be associated with the proposed action are less traditionally industrial, and more specific to the nature of a utility-scale solar energy generation plant. This solar power plant would provide a work environment that includes a solar field located in the high desert. The solar field features thousands of mirrors that heat a heat transfer fluid (HTF) to approximately 750°F. The pipe containing the HTF will reach temperatures at the mirror focal point as high as 1,100 °F. Experience at existing solar generating stations shows that these mirrors break, the pipes age, and HTF can leak and catch fire from ball joints or frayed flex hoses. The area under the solar arrays must be kept free from weeds and thus herbicides will be applied as necessary. Exposure to workers via inhalation and ingestion of dusts containing herbicides poses a health risk. Finally, workers will inspect the solar array for HTF leaks and broken mirrors at least once each day by driving up and down dirt paths between the rows of mirrors and even under the mirrors. Cleaning the mirrors will also be conducted on a routine schedule. All these activities will take place year-round and especially during the summer months of peak solar power generation, when outside ambient temperatures routinely reach 115°F and above.

Consequently, it would be particularly important for the Applicant to have well-defined policies and procedures, training, and hazard recognition and control at BSPP facilities to minimize such hazards and protect workers. If the BSPP complies with all applicable LORS (Table 1-1), workers would be adequately protected from health and safety hazards.

Construction Safety and Health Program

Workers at the BSPP would be exposed to hazards typical of construction, operation and decommissioning of a solar thermal electric power generating facility.

Construction Safety Orders are published at Title 8 California Code of Regulations sections 1502, et seq. These requirements have been promulgated by Cal/OSHA, would apply to the construction phase of the proposed action, and would require the development of a Construction Safety and Health Program. Such a program would include the following:

1. Construction Injury and Illness Prevention Program (8 CCR 1509)
2. Construction Fire Prevention Plan (8 CCR 1920)
3. Personal Protective Equipment Program (8 CCR 1514 — 1522)
4. Emergency Action Program and Plan

Additional programs under General Industry Safety Orders (8 CCR 3200-6184), Electrical Safety Orders (8 CCR 2299-2974) and Unfired Pressure Vessel Safety Orders (8 CCR 450-544) would include:

1. Electrical Safety Program
2. Motor Vehicle and Heavy Equipment Safety Program
3. Forklift Operation Program
4. Excavation/Trenching Program
5. Fall Protection Program
6. Scaffolding/Ladder Safety Program
7. Articulating Boom Platforms Program
8. Crane and Material Handling Program
9. Housekeeping and Material Handling and Storage Program
10. Respiratory Protection Program
11. Employee Exposure Monitoring Program
12. Hand and Portable Power Tool Safety Program
13. Hearing Conservation Program
14. Back Injury Prevention Program
15. Ergonomics Program
16. Heat and Cold Stress Monitoring and Control Program
17. Hazard Communication Program
18. Lock Out/Tag Out Safety Program
19. Pressure Vessel and Pipeline Safety Program
20. Solar Components Safe Handling Program

Operations and Maintenance Safety and Health Program

Prior to the start of operations at BSPP, the Operations and Maintenance Safety and Health Program would be prepared. This operational safety program would include the following programs and plans:

1. Injury and Illness Prevention Program (8 CCR 3203)
2. Fire Protection and Prevention Program (8 CCR 3221)
3. Personal Protective Equipment Program (8 CCR 3401-3411)
4. Emergency Action Plan (8 CCR 3220)

In addition, the requirements under General Industry Safety Orders (8 CCR 3200-6184), Electrical Safety Orders (8 CCR 2299-2974) and Unfired Pressure Vessel Safety Orders (8 CCR 450-544) would apply to the proposed action. Written safety programs for BSPP, which the Applicant would develop, would ensure compliance with the above-mentioned requirements and would assure that the impacts that otherwise could occur would be avoided or sufficiently minimized.

Safety and Health Program Elements

As mentioned above, the Applicant provided the proposed outlines for both a Construction Safety and Health Program and an Operations Safety and Health Program. The measures in these plans are derived from applicable sections of state and federal law. Both safety and health programs would be comprised of six more specific programs and would require major items detailed in the following paragraphs.

Injury and Illness Prevention Program

The IIPP would include the following components as presented in the AFC (Solar Millennium 2009a, Section 5.18.3.1):

1. Identity of person(s) with authority and responsibility for implementing the program;
2. Safety and health policy of the plan;
3. Definition of work rules and safe work practices for construction activities;
4. System for ensuring that employees comply with safe and healthy work practices;
5. System for facilitating employer-employee communications;
6. Procedures for identifying and evaluating workplace hazards and developing necessary program(s);
7. Methods for correcting unhealthy/unsafe conditions in a timely manner;
8. Safety procedures; and
9. Training and instruction.

Fire Protection

Although the need for fire department response to solar power plants is not expected to be frequent, experience has shown that there is a significant chance that response needs could arise. Development of the proposed action would be subject to requirements of the Riverside County Fire Department (RCFD), including access requirements. Further, implementation of the proposed action could require response or assistance from the RCFD's hazardous materials response team, advanced life support/ paramedic services, or disaster preparedness and response during construction, operation and maintenance, or closure and decommissioning. The number of workers on site or traveling to and from the site for the project, and thereby could require RCFD assistance, is discussed in FEIS Section 4.14, Social Economics. The types of hazards that could trigger the need for an RCFD response are discussed above. The Applicant would develop and implement a fire prevention program for the BSPP and would be required to fund capital improvements and staffing for the RCFD. The Applicant also has coordinated with the Riverside

County Fire Department to establish the level of fire-related risk that would be associated with the BSPP and to determine the appropriate level of response capability commensurate with that risk and consistent with applicable safety regulations. Based on this planning and coordination, the proposed action would not be expected to cause access-related difficulties for the RCFD or adversely affect its response capability.

Further, compliance with applicable LORS would avoid or reduce the potential for workplace accidents that otherwise would require emergency responders. For example, California regulations applicable to the proposed action would require the Applicant to prepare an Operations Fire Prevention Plan (8 CCR 3221) to determine general program requirements (scope, purpose, and applicability) and potential fire hazards; to develop good housekeeping practices, proper handling and materials storage, potential ignition sources and control measures for these sources, and the persons who would be responsible for equipment and system maintenance; to locate portable and fixed fire-fighting equipment in suitable areas; to establish and determine training and instruction requirements; and to define recordkeeping requirements. Applicable regulations also would require preparation of a Personal Protective Equipment (PPE) and first aid supplies whenever hazards are present that, due to process, environment, chemicals or mechanical irritants, can cause injury or impair bodily function as a result of absorption, inhalation, or physical contact (8 CCR 3380-3400). All safety equipment would have to meet National Institute of Safety and Health (NIOSH) or American National Standards Institute (ANSI) standards, and would carry markings, numbers, or certificates of approval. Respirators would meet NIOSH and Cal/OSHA standards. Each employee would be provided with the following information pertaining to the protective clothing and equipment: Proper use, maintenance, and storage; when to use the protective clothing and equipment; benefits and limitations; and when and how to replace the protective clothing and equipment. Compliance with the PPE Program would ensure that the Applicant complies with applicable PPE requirements and provides employees with the information and training necessary to protect them from potential workplace hazards. Further, applicable regulations would require an Emergency Action Plan (8 CCR 3220), which would outline an emergency action plan (Solar Millennium 2009a, Section 5.18.3.2). It is expected that the Emergency Action Plan would identify roles and responsibilities; determine emergency incident response training; develop emergency response protocols; specify evacuation protocols; define post emergency response protocols; and determine notification and incident reporting. Additional LORS) called *safe work practices* would apply to the proposed action. Both the Construction and the Operations Safety Programs would address safe work practices under a variety of programs. The components of these programs would include, but not be limited to, the programs discussed above. Employee safety training would include safe work practices.

Alternatives

Action Alternatives

Construction and operation of the Reconfigured Alternative and the Reduced Acreage Alternative would have similar worker safety impacts as those described for the proposed action since the facilities under these alternatives would generally be the same, with only a minor reconfiguration

of one solar unit or a 25 percent reduction in the overall acreage. Therefore, there would be no substantial change in impacts associated with worker safety under these alternatives.

No Action Alternatives A and C

Under No Action Alternative A, the site would become available to other uses that are consistent with BLM's land use plan, potentially including another solar project. Under No Action Alternative C, the Proposed Action would not be implemented and BLM would allow for other solar projects on the site. Under these no action scenarios, other renewable energy projects could be constructed to meet state and federal mandates, and would likely require construction activities and facilities that would have similar worker safety impacts to the Proposed Action.

No Action Alternative B

Under No Action Alternative B, the site would be unavailable for future solar development. Under this no action scenario, it is expected that the site would remain in its existing condition. However, other uses consistent with the CDCA Plan multiple use classification could be developed or occur. Such other activities could cause similar, greater or lesser worker safety impacts relative to the proposed action.

4.11.9.3 Cumulative Impacts

Incremental worker safety-related impacts of the BSPP would result in a risk level that would remain below thresholds of concern and, therefore, would not cause or contribute to any cumulative effect on worker safety. Regardless of the level of solar development or acreage developed under either of the action alternatives, the utility-scale solar energy development that would result would be subject to the same worker safety requirements as the proposed action and, therefore, also would not result in a risk level that could cause or contribute to any cumulative effect on such safety. The No Action Alternatives are not expected to require workers, and so would not be expected to affect worker safety.

For the fire safety-related issues of emergency medical and hazardous materials spill response, the incremental impacts of the BSPP could result in a cumulative effect when combined with the incremental impacts of other projects in the cumulative scenario. More specifically, a cumulative Worker Safety/Fire Protection impact would occur in the event of a simultaneous need for a fire department to respond to multiple locations such that its resources and those of the mutual aid fire departments (which routinely respond in every-day situations to emergencies at residences, commercial buildings, and heavy industry) are over-whelmed and cannot effectively respond. For purposes of this analysis, the cumulative impacts area for fire safety-related resources consists of the RCFD's service area. Potential cumulative fire safety-related effects could occur over the course of 40 or more years, encompassing the entire lifespan of the BSPP, from construction and operation and maintenance, through closure and decommissioning, since people could be on, or en route to, the site throughout this timeframe.

Existing conditions within the cumulative impacts area reflect a combination of the natural condition and the effects of past actions and are described in FEIS chapter 3. Direct and indirect

effects of the BSPP are analyzed above. Past, present and reasonably foreseeable future actions making up the cumulative scenario are identified in Section 4.1 and include existing locations that might require a fire department response as well as facilities proposed for construction, operation or demolition. Any such location within the cumulative impacts area could require response from off-site fire departments for fire, hazardous materials, or emergency medical service emergencies. Cumulative impacts could occur despite the many safeguards implemented to both prevent and control fires, hazardous materials releases, and injuries/accidents, because of the great distances involved in response and expansive sites. Although the chances of two or more solar power plants requiring emergency response simultaneously may be low, a response to one distant site could impede or preclude a simultaneous response to another solar plant, residential or commercial location, or other location in demand. However, while cumulative impacts theoretically are possible, they are not likely given the 14-stations located within the RCFD's service area and mutual aid agreements. Emergency response capabilities would be adequate.

4.11.9.4 Summary of Mitigation Measures

The implementation of mitigation measures imposed by the Energy Commission as Conditions of Certification for the BSPP also would avoid or reduce impacts on the quality of the human environment. These mitigation measures are set forth in Appendix G. The following would address impacts on worker safety / fire safety:

> WORKER SAFETY-1, WORKER SAFETY-2, WORKER SAFETY-3, WORKER SAFETY-4, WORKER SAFETY-5, WORKER SAFETY-6, WORKER SAFETY-7, WORKER SAFETY-8, WORKER SAFETY-9

4.11.9.5 Residual Impacts after Mitigation Measures were Implemented

None are expected.

4.11.9.6 Unavoidable Adverse Impacts

None are expected.

4.11.10 Public and Private Airstrips/Airfields

4.11.10.1 Impact Assessment Methodology

Review of FAA requirements, the airport compatibility plan for the Blythe Municipal Airport, data and analysis provided by the Applicant and in the Energy Commission's Revised Staff Assessment were reviewed in connection with this analysis.

4.11.10.2 Direct and Indirect Impacts

Proposed Action

Potential impacts of the proposed action on the Blythe Airport and generally on aviation are discussed in EIS Section 4.11.7, Transmission Line Safety and Nuisance, and EIS Section 4.11.8, Traffic and Transportation Safety. Such impacts relate, for example, to reflectivity and temporary flash occurrences; radio frequency emissions for electrical motors or other on-site equipment (transmission lines) and the potential for interference; height and velocity of thermal plumes from the dry cooling units; height and location of structures, including the dry cooling units and power poles and lines; provision of adequate open space within any portion of the project potentially within compatibility Zone D; and the cumulative impacts of additional hazards to flight considering the amount of existing and proposed solar (and conventional energy generating) facilities surrounding the Blythe Airport.

Alternatives

Potential impacts of alternatives to the proposed action on the Blythe Airport and generally on aviation also are discussed in EIS Section 4.11.7, Transmission Line Safety and Nuisance, and EIS Section 4.11.8, Traffic and Transportation Safety. See above.

4.11.10.3 Cumulative Impacts

Potential cumulative impacts on the Blythe Airport, and on aviation more generally, are discussed in EIS Section 4.11.7, Transmission Line Safety and Nuisance, and EIS Section 4.11.8, Traffic and Transportation Safety. See above.

4.11.10.4 Summary of Mitigation Measures

No mitigation measures other than the ones identified in Section 4.11.7, Transmission Line Safety and Nuisance, and EIS Section 4.11.8 would improve the project with respect to potential impacts on public and private airstrips. Thus, none are identified.

4.11.10.5 Residual Impacts after Mitigation Measures were Implemented

Other than any identified in Sections 4,12,7 and 4.11.8, no residual impacts are expected.

4.11.10.6 Unavoidable Adverse Impacts

Other than any identified in Sections 4,12,7 and 4.11.8, no unavoidable adverse impacts are expected.

4.11.11 Geologic Hazards

4.11.11.1 Impact Assessment Methodology

The proposed action and alternatives are evaluated qualitatively in terms of their effect on soil and mineral resources as well as in terms of their susceptibility to geologic and seismic hazards. Potential effects on these resources are assessed based upon existing publications and maps completed by regulatory agencies, such as the United State Geological Survey, California Geologic Survey, California Division of Mines and Geology and geotechnical engineers who have evaluated the site. The potential for damage to proposed structures or increased risk of injury due to geologic hazards is analyzed using available data from the aforementioned sources. In addition, the conclusions and recommendations provided in the geotechnical investigation are evaluated, and, where appropriate, incorporated into the analysis.

The following issues were considered in the analysis of impacts related to geology and soils for the proposed action and each alternative:

1. Accelerated and/or environmentally harmful soil erosion;
2. Damage to project elements or increased exposure of the public to risks from rupture of a known earthquake fault;
3. Injury, death, or property damage as a result of earthquake induced ground deformations (e.g. lateral spreading, subsidence, liquefaction, or collapse), or otherwise unstable soils;
4. Injury, death, or property damage as a result of an onsite or offsite landslide;

4.11.11.2 Impact Analysis

Proposed Action

Groundshaking

The occurrence of relatively large earthquakes in the Mojave region demonstrates that the site is likely to be subject to moderately intense earthquake-related ground shaking in the future (Modified Mercalli Intensity Level VI) over the life of the BSPP. The anticipated level of shaking, based on the estimated peak ground acceleration (PGA) value at the site (discussed under Seismic Hazards) could result in slight damage to older structures and would not likely result in damage to newer structures built according to current design standards. Several laws and policies impose stringent seismic safety requirements on the design and construction of new structures (see Table 1-1). While ground-shaking at the site would not constitute a major effect, mitigation should be implemented to the extent practical through structural designs consistent with the California Building Code and the site-specific geotechnical report that would be required for the BSPP to minimize risks associated with severe ground-shaking.

Secondary Earthquake Hazards.

The site is located in an area with low to moderate level of liquefaction potential (RCLIA 2009). However, the dense to very dense nature of sandy and gravelly soils encountered in the BSPP borings (Kleinfelder 2009), coupled with a groundwater table depth of greater than 150 feet below the ground surface, indicates that there is no liquefaction potential at the site (Kleinfelder 2009). Consequently, the potential for lateral spreading during seismic events would be negligible. No subsurface information is available along the portion of the site excluded from the geotechnical investigation. These areas of the site should be addressed in a BSPP-specific geotechnical report.

The site generally is underlain by dense to very dense granular soils. However, there is a potential that loose sand layers occur both at the surface and as buried layers between the borings since the site is situated on alluvial fan and alluvial valley deposits (Kleinfelder 2009). These layers create potential for earthquake-induced settlement. The potential for and mitigation of the effects of earthquake-induced settlement of site soils during an earthquake should be addressed in a BSPP-specific geotechnical report. Common mitigation methods include deep foundations (driven piles; drilled shafts) for severe conditions, geogrid-reinforced fill pads for moderate severity and over-excavation and replacement for areas of minimal hazard.

Subsidence and Settlement

No regional subsidence due to the historic groundwater withdrawal has been reported in the vicinity of the proposed BSPP (Solar Millennium 2009a). Further, no localized or regional subsidence was recorded even during the 1980's and 1990's when regional groundwater extraction was at its historic maximum of approximately 48,000 acre-feet per year in the general area. In addition, no petroleum or natural gas withdrawals are taking place in the proposed site vicinity. Therefore, the potential for local or regional ground subsidence resulting from petroleum, natural gas, or groundwater extraction is considered to be very low.

Hydrocompaction

The geotechnical report prepared for the BSPP indicates a low to moderate risk of hydrocompaction based on the geotechnical data and the observation of soil profile in the test pits (Kleinfelder 2009). The potential for and mitigation of the effects of hydrocompaction of site soils should be addressed in a project-specific geotechnical report. Typical mitigation measures would include over-excavation/replacement, mat foundations or deep foundations depending on severity and foundation loads.

Corrosive Soils

Fine grain, moist soils containing sulfides are present at the site and would be corrosive to buried structures. If a buried structure were to corrode as a result of contact with these solids, it could crack or prematurely fail. However, on site soil conditions are neither unique nor particularly hazardous, and methods to address corrosive and expansive soils are common engineering practices. Consequently, the effects of corrosive soils could be mitigated effectively through final design by incorporating the recommendations of a site-specific geotechnical report. Typical mitigation measures would include backfilling pipeline excavations with suitable clean engineering fill.

Erosion

The preliminary stages of construction, especially site grading, excavation, and soil stockpiling would leave loose soil exposed to the erosive forces of rainfall and high winds. Because soil surface disturbance for the proposed project would be greater than one acre, specific erosion control measures would be identified as part of the National Pollutant Discharge Elimination System (NPDES) General Construction permit and Storm Water Pollution Prevention Plan (SWPPP) required for construction. During construction, erosion control measures would be implemented that utilize Construction Water Quality Best Management Practices (BMPs) to avoid or minimize soil erosion and off-site sediment transport. Examples of typical construction BMPs include scheduling or limiting activities to certain times of the year, in particular to avoid flash floods; installing sediment barriers such as silt fence and fiber rolls along the perimeter of the active construction area; maintaining equipment and vehicles used for construction; and developing and implementing a spill prevention and cleanup plan. The SWPPP (and associated BMPs) would be prepared and implemented prior to commencing construction, and BMP effectiveness would be ensured through the sampling, monitoring, reporting, and record keeping requirements contained in the construction general permit. In addition, the general construction permit required under the NPDES program would require that the topsoil be preserved in areas requiring grading in order to ensure proper implementation of post-construction BMPs for site restoration. Therefore, substantial or accelerated soil erosion or loss of topsoil during and following construction would be minor.

In sum, the main geologic hazards at this site include ground shaking, hydrocompaction, earthquake inducted settlement, corrosive soils, and erosion. These potential hazards could be mitigated effectively through facility design by incorporating recommendations contained in a design-level geotechnical report.

Alternatives

Action Alternatives

The geologic units that would be disturbed by the Reconfigured Alternative or Reduced Acreage Alternative are the same as those that would be disturbed by the proposed action. Each of the action alternatives would have similar geographic and physical relationship of faults and major geologic features. The main geologic hazards for each of the action alternatives would include ground shaking, hydrocompaction, earthquake induced settlement, corrosive soils, and erosion. Therefore, no changes to the levels of impact, beyond those discussed for the proposed action, would be anticipated for either the Reconfigured Alternative or Reduced Acreage Alternative.

No Action Alternative A

If No Action Alternative A were selected, the construction and operational impacts of the BSPP would not occur. There would be no grading of the site and no installation of power generation and transmission equipment. Throughout the project area there is potential for strong seismic ground shaking in the event of a Maximum Credible Earthquake (MCE), which would be a magnitude 7.9 earthquake on the Southern San Andreas Fault. Seismic activity also could result from earthquake-induced settlement. Corrosive soils are present on the site, although they would

not be expected to pose a public health and safety threat under this alternative. Erosion would occur in a manner consistent with existing conditions relating to wind and flash flooding. Geologic hazards would not affect public health and safety under No Action Alternative A. No Action Alternative A also would eliminate contributions to cumulative impacts on a number of resources and environmental parameters in Riverside County and in the Colorado Desert as a whole.

In the absence of the BSPP, however, other power plants, both renewable and non-renewable, would constructed to serve the demand for electricity and to meet RPS. If No Action Alternative A were chosen, other utility-scale solar power facilities could be built; the resulting impacts to the environment could be similar to, or greater or less than, those of the proposed action depending on where they ultimately are constructed.

No Action Alternative B

Because the CDCA Plan would be amended, it is possible that the site would be developed with the same or a different solar technology. As a result, impacts related to geology could result from the construction and operation of a solar technology and would likely be similar to the impacts from the proposed action. Different solar technologies require different amounts of grading and maintenance; however, it is expected that all the technologies would require some grading and maintenance. As such, No Action Alternative B could result in impacts similar to those of the proposed action. Impacts to other facilities from geologic hazards (i.e. ground shaking, earthquake-induced settlement, etc.) would be similar.

No Action Alternative C

Because the CDCA Plan would be amended to make the area unavailable for future solar development, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site. As a result, the geologic conditions of the site would not be expected to change noticeably from existing conditions and, as such, No Action Alternative C would not result in impacts to geologic resources that could occur during construction of the proposed action. However, in the absence of the BSPP, other renewable energy projects could be constructed to meet State and Federal mandates, and could have similar, or greater or lesser, impacts than the proposed action depending on their ultimate location.

4.11.11.3 Cumulative Impacts

Impacts resulting from construction, operation, maintenance and decommissioning of the BSPP could result in a cumulative effect in connection with geologic resources and hazards with other past, present, or reasonably foreseeable future actions. The geographic scope of the cumulative impacts analysis for such resources is limited generally to the BSPP site and transmission line route overlying the Palo Verde Valley groundwater basin. This geographic scope of cumulative impacts analysis was established because potential cumulative effects, as they pertain to geologic hazards, generally are limited to regional subsidence due to groundwater withdrawal in the Palo Verde Valley groundwater basin. Impacts associated with strong ground shaking and earthquake-

induced settlement, hydrocompaction, and corrosive soils are not cumulative in nature and would not add to potential cumulative impacts to the facility. Potential cumulative effects on geologic resources and hazards could occur at any time during the lifespan of the BSPP, from construction to decommissioning.

Existing conditions within the cumulative impacts assessment area of geologic resources and hazards reflect a combination of the natural condition and the effects of past actions and are described in FEIS chapter 3. Direct and indirect effects of the BSPP are analyzed above. Briefly, however, the construction of the BSPP is not expected to require any significant amount of groundwater pumping; thus, impacts to regional subsidence are not expected. Construction of the BSPP is expected to cause minor and temporary contribution to erosion. The operation of the BSPP is expected to result in about a 600-ac-ft/yr increase in annual groundwater pumping. Since operation of the BSPP would only contribute a minor amount of additional groundwater withdrawal to the overall amount in the Palo Verde groundwater basin and since this cumulative amount is only a fraction of historic pumping levels that did not result in any documented subsidence, operation of the BSPP is not expected to impact regional subsidence in the Palo Verde groundwater basin. Operation of the BSPP is not expected to require any significant excavation or grading such that cumulative impacts to soil resources are not expected. Finally, decommissioning of the BSPP is not expected to require any significant amount of groundwater pumping; impacts to regional subsidence are not expected. Decommissioning of the BSPP would include excavation and grading at the site. Compliance with the required NPDES General Construction Permit and proper implementation of applicable BMPs would insure that any erosion impacts are minor.

Past, present and reasonably foreseeable future actions making up the cumulative scenario are identified in Section 4.1. Although minor, the BSPP could contribute a level of impact to cumulative geologic resource and hazard conditions.

Subsidence and Settlement

Historic groundwater withdrawals of approximately 48,000 acre-feet per year (ac-ft/yr) have not resulted in any documented subsidence in the vicinity of the proposed BSPP. The proposed action would result in increased annual groundwater pumping, from the current 2,000 aft/yr to approximately 2,600 aft/yr (a 30 percent increase). Several projects identified in the cumulative scenario (FEIS Section 4.1) are located within the Palo Verde Valley groundwater basin. Such projects could include groundwater pumping of similar magnitude to the BSPP; however, the combined effect of these projects would still result in much less than the historic rate of 48,000 ac-ft/yr. Since this level of pumping did not result in any documented regional subsidence, significant impacts to regional subsidence would not be expected. Therefore, there would be no significant cumulative contribution to regional subsidence from foreseeable renewable projects, including the BSPP, in the Palo Verde Valley groundwater basin. Additional information on groundwater withdrawal is contained in Section 4.19, Water Resources.

Erosion

Erosion resulting from implementation of past, present and reasonably foreseeable projects could result in significant impacts to soil and water resources. Increased development and areas covered with impervious surfaces in the vicinity of the BSPP could result in decreased stormwater infiltration. Decreased infiltration corresponds to increased runoff and erosion potential. Stormwater quality is regulated under the NPDES program. It is expected that all development projects in the vicinity of the BSPP would have to comply with NDPES program requirements, regardless of whether they fall under the primary jurisdiction of a federal, state or local agency. As a result, each project would implement BMPs, such as those discussed above, during and after construction in order to minimize erosion. Therefore, no substantial cumulative contribution to erosion is expected to result from the cumulative projects, including the BSPP.

Based on the above discussion, the potential for significant adverse cumulative impacts to the proposed project from geologic hazards during the project's design life is negligible and that the potential for impacts to geologic resources is very low. For the reasons discussed above, impacts of alternatives to the BSPP could contribute to cumulative geologic conditions and hazards in proportion to the extent to which they affect such conditions at all.

4.11.11.4 Summary of Mitigation Measures

Implementation of the mitigation measures imposed by the Energy Commission as Conditions of Certification for the BSPP also would avoid or reduce impacts on the quality of the human environment. These mitigation measures are set forth in Appendix G. The following address impacts associated with geologic hazards:

CIVIL-1, CIVIL-2, CIVIL-3, CIVIL-4

STRUC-1

GEO-1

SOIL&WATER-1

4.11.11.5 Residual Impacts after Mitigation Measures were Implemented

None are expected.

4.11.11.6 Unavoidable Adverse Impacts

None are expected.

4.11.12 Site Security

4.11.12.1 Impact Assessment Methodology

The energy generation sector is one of 14 areas of Critical Infrastructure listed by the U.S. Department of Homeland Security (DHS). The level of security needed for any particular facility

depends on the threat imposed, the likelihood of an adversarial attack, the likelihood of success in causing a catastrophic event, and the severity of consequences of that event. The U.S Department of Homeland Security's Chemical Facility Anti-Terrorism Standards require facilities that use or store certain hazardous materials to conduct vulnerability assessments and implement certain specified security measures. These standards were implemented with the publication of Appendix A, a list of chemicals of interest

4.11.12.2 Impact Analysis

Proposed Action

Neither the chemical constituents of Therminol VP-1 (diphenyl ether and biphenyl) nor other chemicals proposed to be used and stored at this proposed power plant are on the chemicals of interest list and, thus, the proposed facility would not be covered by the standards. However, all power plants under the Energy Commission's jurisdiction should implement a minimum level of security consistent with the Standards and, as a contributing element of the energy sector, the BSPP should provide at least that minimum level of security needed to protect California's electrical infrastructure from malicious mischief, vandalism, or domestic/foreign terrorist attacks.

The level of security needed for a particular power plant depends on the threat imposed, the likelihood of an adversarial attack, the likelihood of success in causing a catastrophic event, and the severity of consequences of that event. To determine an appropriate level of security for the BSPP, Energy Commission staff used an internal vulnerability assessment decision matrix modeled after the U.S. Department of Justice Chemical Vulnerability Assessment Methodology (July 2002), the NERC 2002 guidelines, the U.S. Department of Energy VAM-CF model, and U.S. Department of Homeland Security regulations published in the Federal Register (Interim Final Rule 6 CFR Part 27). Based on this analysis, the BSPP would fall into the "low vulnerability" category. Accordingly, Energy Commission staff proposed that certain security measures be implemented.

Alternatives

Action Alternatives

If an energy generation facility were constructed on the proposed site, the level of security needed would be facility-specific and depend on the threat imposed, the likelihood of an adversarial attack, the likelihood of success in causing a catastrophic event, and the severity of consequences of that event. It is assumed that consideration of these factors would result in the same conclusion for either the Reconfigured Alternative or Reduced Acreage Alternative as for the proposed action: "low vulnerability."

No Action Alternative A

If No Action Alternative A were selected, there would be no site security issue.

No Action Alternative B

Because the CDCA Plan would be amended to identify the site as suitable for solar energy development, site security impacts associated with any resulting facility would likely be comparable to those of the proposed action.

No Action Alternative C

Even though the CDCA Plan would be amended to make the area unavailable for future solar development, other renewable energy uses could be developed with the appropriate CDCA Plan amendment. Site security impacts would result from the development of any energy generation facility on the site at a level commensurate with the threat imposed, the likelihood of an adversarial attack, the likelihood of success in causing a catastrophic event, and the severity of consequences of that event. However, if a use other than energy generation were to be developed or pursued, no energy generation-related site security impact would result.

4.11.12.3 Cumulative Impacts

The development and operation of the BSPP would contribute an incremental "low vulnerability" site security threat to a cumulative effect relative to site security with other past, present, or reasonably foreseeable future energy generation actions. The geographic scope of the cumulative impacts analysis for such threat would be the California Desert area. Potential cumulative site security effects could occur at any time during the lifespan of the BSPP, from construction to decommissioning, and would not persist past closure and decommissioning.

Other past, present and reasonably foreseeable future energy generation projects are identified in PA/FEIS Section 4.1. As of January 2010, there were 244 renewable projects proposed in California in various stages of the environmental review process or under construction. 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. In addition, nearly 80 applications for solar and wind projects are being considered on BLM land in Nevada and Arizona. (CEC RSA June 2010) Renewable energy projects in BLM's California Desert District are identified in Table 4.1-2. Renewable energy projects on state and private lands are identified in Table 4.1-3. The BLM has not received facility-specific threat determinations such as the one prepared for the proposed BSPP; however, given the utility-scale nature of the proposed action and similarities with other proposed utility scale solar proposals such as Genesis, Palen, and Desert Sunlight, the BLM assumes that threat levels among the facilities would be comparable. Smaller projects could have an even lower vulnerability. Although the threat imposed and likelihood of an adversarial attack may be comparable regardless of facility size, the likelihood of a smaller (lower energy output) facility's success in causing a catastrophic event and the severity of consequences of that event would seem reduced.

The presence of other Department of Homeland Security "Critical Infrastructure and Key Resources" sectors in the cumulative impacts analysis area, if present, also could contribute incrementally to the overall threat level. Such other sectors include National Monuments and

Icons, Agriculture and Food, Banking and Finance, Chemical, Commercial Facilities, Critical Manufacturing, Dams, Defense Industrial Base, Emergency Services, Government Facilities, Healthcare and Public Health, Information Technology, Nuclear Reactors, Materials and Waste, Postal and Shipping, Water, Communications, and Transportation Systems (including aviation and highway). Thus, the Wileys Well Communication Tower, Blythe Municipal Airport, and I-10 each could contribute an incremental impact to the overall security threat.

4.11.12.4 Summary of Mitigation Measures

In order to ensure that this facility (or a shipment of hazardous material) is not the target of unauthorized access, mitigation measures HAZ-5 and HAZ-6 (see Appendix G) address both construction security and operations security plans. These plans would require the implementation of site security measures that are consistent with the Security Guidelines for the Electricity Sector published by the North American Electric Reliability Corporation in 2002 (NERC, 2002); the Critical Infrastructure Protection standard for cyber security (NERC, 2009); and the U.S. Department of Energy's Vulnerability Assessment Methodology for Electric Power Infrastructure in 2002 (DOE, 2002). These security measures include perimeter fencing and breach detectors, possibly guards, alarms, site access procedures for employees and vendors, site personnel background checks, and law enforcement contact in the event of a security breach. Site access for vendors would be strictly controlled. Consistent with current state and federal regulations governing the transport of hazardous materials, hazardous materials vendors would have to maintain their transport vehicle fleets and employ only drivers who are properly licensed and trained. The project owner would be required, through its contractual language with vendors, to ensure that vendors supplying hazardous materials strictly adhere to the U.S. DOT requirements that hazardous materials vendors prepare and implement security plans per 49 CFR 172.802 and ensure that all hazardous materials drivers are in compliance with personnel background security checks per 49 CFR Part 1572, Subparts A and B. The compliance project manager (CPM) may authorize modifications to these measures, or may require additional measures in response to additional guidance provided by the U.S. Department of Homeland Security, the U.S. Department of Energy, or NERC, after consultation with appropriate law enforcement agencies and the Applicant.

4.11.12.5 Residual Impacts after Mitigation Measures were Implemented

None are expected.

4.11.12.6 Unavoidable Adverse Impacts

None are expected.

4.12 Impacts on Recreation

4.12.1 Impact Assessment Methodology

The BSPP is analyzed for its effects on recreational resources by assessing the impacts to land acreage as well as types of known recreational uses including hiking, backpacking and long term camping in established Federal, State, or local recreation areas and/or wilderness areas.

The CDCA Plan recognizes that the California desert is “a reservoir of open space and as a place for outdoor recreation” (CDCA Plan, BLM, 1980, page 69). The CDCA Plan notes that the diverse landscape of the California desert provides for a variety of physical settings. Further, the CDCA Plan identifies the wide variety of desert recreation uses, ranging from off-road vehicles to outdoor preservationists, and the increasing challenge to accommodate these varied and sometimes competing uses. For example, Long Term Visitor Area (LTVA) visitors typically enjoy backcountry vehicle touring on routes and washes and in the surrounding areas and, thus, would be impacted by the closures of open vehicle routes in the vicinity of the BSPP. However, this section 4.12 focuses on non-transportation-related recreational opportunities. For impacts to OHV users, see Section 4.16 Impacts on Transportation and Public Access - Off-Highway Vehicle Resources.

4.12.2 Discussion of Direct and Indirect Impacts

Proposed Action

On-Site Recreational Users

According to the Recreation Element of the CDCA Plan, “lands managed by the Bureau [BLM] are especially significant to recreationists.” The conversion of 6,000 acres of public land to support the BSPP could disrupt dispersed recreational activities. Construction activities associated with the proposed action could cause direct and indirect impacts on noise, fugitive dust, and truck and other vehicle ingress and egress to the construction site; visual intrusions also could impact visitors seeking experiences for natural setting. During operations, the site would not be available for recreational use. However, such use could resume upon closure and decommissioning. Although day users, hikers and RV campers would no longer be able to utilize this area for dispersed recreational opportunities and related experiences and benefits during construction and operation of the BSPP, dispersed recreational activities has not been observed within the project area by BLM Rangers; therefore impacts to recreational user opportunities would be minimal.

Campers, hikers and backpackers could compensate by utilizing other desert lands in the vicinity of the proposed site for their recreational experiences and benefits. This could result in more concentrated use of those areas, leading to loss of some native vegetation, wildlife habitat fragmentation or loss, elevated soil loss, increases in noise, and possible temporary declines in air quality from more concentrated vehicle use in a smaller available area. However, this impact

would be minimal because, as discussed above, high recreational use has not been observed within the project area by the BLM Rangers.

Off-Site Recreational Users

Effects to recreational users of specially-designated lands (including wilderness, ACECs and LTVAs) could occur. For a discussion of potential impacts to OHV route access to wilderness areas, see Section 4.16, Impacts on Transportation and Public Access - Off Highway Vehicle Resources. For a discussion of the potential impacts to visual quality from wilderness areas and ACECs see Section 4.18, Impacts on Visual Resources.

Special Designations

Five wilderness areas are located in the vicinity of the site: the Palen/McCoy, Big Maria Mountains, Rice Valley, Little Chuckwalla Mountains and Riverside Mountain. The Palen/McCoy Wilderness is the closest to the BSPP site at approximately four miles to the northwest. Recreational users could be impacted by construction, operation and decommissioning activities that would generate noise and dust.

As discussed in Section 4.9, *Impacts on Noise*, typically, “high pressure steam blow” is the loudest noise encountered during construction of a project incorporating a steam turbine. With a silencer installed on the steam blow piping, as required under NOISE- 7, noise levels commonly are attenuated to 89 dBA at 50 feet. During operation, the primary noise source of the BSPP would be the power block. The Applicant predicts the proposed action’s operational noise level at receptor LT to be 40 dBA Leq at 725 feet. Closure and decommissioning-related noise would be less than expected for construction, since no high pressure steam blows would be required, but in other respects are anticipated to be comparable to construction noise levels. Considering the fact that the nearest special designation where recreational use would occur is approximately four miles from the BSPP site, noise would attenuate such that the sound from the loudest noise associated with construction, the steam blow, would be barely audible (approximately 23 dBA at 21,120 feet); noise associated with operational activities would be virtually inaudible (approximately dBA at 21,120 feet) and noise associated with decommission would be less than construction. Therefore, impacts to recreational users would be minimal.

As discussed in Section 4.2, Impacts on Air Resources, construction, operations and decommissioning activities could generate dust in the form of PM10/PM2.5. However, the worst-case PM2.5 and PM10 impacts occur at the fence line and drop off quickly with distance. Therefore, there would be no impacts to recreational users within special designation areas.

Long Term Visitor Areas

The Midland Long Term Visitor Area (LTVA) is located approximately five miles northeast of the proposed site. Visitors camping at this LTVA are seeking opportunities for socialization with similar users in a semi-primitive environment. As noted above, due to the distance from the BSPP there would be no impacts to recreational users from noise and/or dust crated by construction, operations and decommissioning activities. It is anticipated that some construction workers could

reside in RV campers at the Mule Mountain and Midland LTVAs in California and the La Posa LTVA south of Quartzsite in Arizona, or possibly camp on public lands in the vicinity of the proposed site during the construction phase of the project. Although the BLM offers developed campgrounds within commuting distance of the project, only the LTVAs allow long-term camping. The Midland and Mule Mountains LTVAs allow camping up to seven months (September 14 to April 16) with a special use permit. Outside of these dates, the camping limit is 14 days. Depending on the number of authorized workers using the LTVA, use could impact the social setting or the physical infrastructure of the LTVAs. However, the LTVAs are designed with minimal facilities given that campers must use self-contained RVs and there are no assigned or designated sites, except for the Wiley's Well and Coon Hollow Campgrounds within the Mule Mountain LTVA. Midland LTVA is 135 acres and averages 41 permits per year. Mule Mountain LTVA is 2,805 acres with an average of 135 permits per year. Except for the designated campsites at Wiley's Well and Coon Hollow, each LTVA can accommodate several hundred RV units with a minimum distance of 15 feet between units, which is well in excess of current use.

Impacts to LTVAs from maximum authorized use by construction workers would be to the social and recreation experience of winter users. If the LTVAs were used to a level that spacing and relative solitude is reduced, seasonal long-term visitors could move to other LTVAs in Arizona or Imperial County, thereby compounding crowding at these already popular sites. If there is significant use of the LTVAs by workers, then the BLM may need to increase law enforcement patrols at the LTVAs, thus reducing patrols on public lands elsewhere.

Although it theoretically is possible that unauthorized use of these LTVAs could occur when they are closed from April 16 to September 14, such use would be subject to law enforcement and, in any event, would be unlikely since it is extremely hot during the closed season.

Conclusion

Therefore, impacts associated with construction and operation of the BSPP to on-site and off-site recreational users would be minimal. Impacts associated with closure and decommissioning would likely benefit recreational values, since additional acres would be reclaimed and, thereby, made available for active or passive recreational use.

Alternatives

Reconfigured Alternative

The selection of the Reconfigured Alternative would disturb approximately 150 additional acres relative to the proposed action. Impacts to on-site and off-site recreational users associated with the operation, maintenance and closure would be similar to the proposed action.

Reduced Acreage Alternative

If this alternative were selected, the only difference with regard to direct and indirect effects relative to the proposed action would correlate directly to the reduction of 1,200 acres of surface

disturbance. Other impacts to on-site and off-site recreational users associated with the operation, maintenance and closure would be similar to the proposed action.

No Action Alternative A

If No Action Alternative A were selected, none of the anticipated recreation-related impacts of the proposed action would occur. Instead, the land on which the BSPP is proposed would become available to other uses consistent with CDCA Plan use opportunities, potentially including another renewable energy project. Thus, impacts of this alternative on recreation could be substantially similar to the proposed action.

No Action Alternative B

If No Action Alternative B were selected, the CDCA Plan would be amended to make the site unavailable for future solar development. Other use opportunities consistent with the CDCA Plan would remain available. Thus, recreation-related-impacts of this alternative would vary from no impacts (e.g., if the site were left in its existing condition and no structures built that could affect the recreational opportunities or experiences available from adjacent properties) to substantial impacts (e.g., if a more intense or intrusive use were made depending on what use ultimately remain in its existing condition, with no new structures or facilities constructed or operated on the site. Generally, for the two no action alternatives, there would be no direct or indirect impacts the recreational opportunities and experiences.

Alternative Action C

If the No Action Alternative C, which would deny the ROW and amend the CDCA to find the proposed action area as suitable for any type of solar energy development, recreation opportunities would be impacted to the same degree and extent as the proposed action. For example, if the acreage of the future solar energy developed is 50 percent less and the technology is similar to the BSPP, then impacts to recreation opportunities would be 50 percent less. However, different solar technologies in the future could present different impacts on the recreational opportunities.

4.12.3 Discussion of Cumulative Impacts

Impacts to on-site and off-site recreational users resulting from construction and operation of the BSPP would be minimal, and impacts associated with closure and decommissioning would likely benefit recreational values, since additional acres would be reclaimed and, thereby, made available for active or passive recreational use. Accordingly, the potential for incremental, BSPP-specific, impacts to result in a cumulative effect on recreation with other past, present, or reasonably foreseeable future actions seems low. The geographic scope of the cumulative effects analysis for recreation consists generally of the California Desert, with emphasis on eastern Riverside County, and specifically of specially-designated recreation or wilderness areas (including ACECs and LTVAs).

Past, present and reasonably foreseeable future actions making up the cumulative scenario are identified in Section 4.1. Existing conditions within the cumulative impacts area reflect a combination of the natural condition, including related recreational opportunities, and the effects of past actions. See, e.g., Table 4.1-4, Existing Projects along the I-10 Corridor Eastern Riverside County. No existing significant adverse cumulative impact on recreation is apparent.

Present and reasonably foreseeable future actions, including other renewable energy projects, making up the cumulative scenario also are identified in Section 4.1. See, e.g., Table 4.1-2, Renewable Energy Projects in the California Desert District, and Table 4.1-3, Renewable Energy Projects on State and Private Lands. Individually and collectively, these projects would add large- and small-scale industrial, utility-related and other uses in the region, resulting in direct preclusion of access to recreational lands that would be dedicated to other, non-recreational uses. Within the California Desert District, approximately 567,882 acres potentially available for recreational use could be lost to solar development, and an additional 433,721 acres could be lost to wind development (see Table 4.1-2). However, most of the projects in the cumulative scenario are in areas with low recreation use or potential future opportunities. In some cases, the facilities themselves may become local or regional attractions for travelers or sightseers, especially if the projects include interpretive sites or visitor facilities. This would be a change in type of use, but could result in a net gain for recreation opportunities. To the extent that No Action Alternatives A and B would not result in development of the site, no cumulative impact on recreation would occur. Although the proposed action's effects on recreation individually would be low for the BSPP area, this impact, in combination with past, present, and proposed and reasonably foreseeable projects in eastern Riverside County could highly impact recreation opportunities and experiences of users, communities, and regional populations.

4.12.4 Summary of Mitigation Measures

The following mitigation measures would be imposed by the BLM to avoid or reduce impacts on the quality of the human environment. The following mitigation measures would avoid or minimize impacts on recreation:

> **BLM-REC-1:** The Applicant shall engage residents of Blythe, recreation user groups, interested public, organizations, and agencies to identify specific recreation management prescriptions to provide alternative recreational opportunities and experiences on the lands outside the BSPP site boundary. This effort shall delineate what the BLM and its partners would do to provide any additional management, marketing, monitoring, and administrative actions to meet recreational benefit demands for this area.
>
> **BLM-REC-2:** The Applicant shall prepare and distribute interpretative materials including a construction schedule and safety information regarding trucks and other heavy equipment on local roads, to users of the Midland, Mule Mountains and La Posa LTVA's, Wiley Wells and Coon Hollow Campgrounds, and BLM kiosks stating the development of the solar facilities at the BSPP site and the temporary or permanent closure of approximately 6,000 acres of public land to recreational use. The BLM authorized officer shall approve the draft materials prior to distribution.

BLM-REC-3: The Applicant shall encourage project workers to utilize local housing or private RV parks in Blythe and/or nearby communities.

BLM-REC-4: No less than 60 days prior to construction, the Applicant shall coordinate construction activities and the BSPP construction schedule with the authorized officer for the recreation areas impacted. The Applicant shall schedule construction activities to avoid heavy recreational use periods in coordination with and at the discretion of the authorized officer. The Applicant shall locate construction equipment to avoid temporary preclusion of recreation areas in accordance with the recommendation of the authorized officer. The Applicant shall document its coordination efforts with the authorized officer and provide this documentation to the Lead Agencies and affected jurisdictions at least 30 days prior to construction.

BLM-REC-5: The Applicant shall coordinate with the authorized officer for the applicable federal, State, or local parks and recreational facilities at least 60 days before construction in order to identify alternative recreation facilities that may be used by the public during construction. The Applicant shall post a public notice at recreation facilities that are to be closed or where access would be limited during project construction. The Applicant shall document its coordination efforts with the parks and recreation departments and provide this documentation to the Lead Agencies and all affected jurisdictions 30 days prior to construction.

4.12.5 Residual Impacts after Mitigation Measures were Implemented

There would be a loss of about 6,000 acres of public lands that would not be available for dispersed camping and other recreation opportunities and experiences within the site boundary for the duration of the BSPP. Such lands would return to public use, including recreational use, following closure and decommissioning.

4.12.6 Unavoidable Adverse Impacts

The surface disturbance that would occur from the BSPP would result in unavoidable adverse impacts on recreation resources by permanent removal of vegetation, landforms, and other nature features of the characteristic landscape for the life of the BSPP or until decommissioning and restoration occurs.

4.13 Social and Economic Impacts

4.13.1 Impact Assessment Methodology

The social and economic analyses of the proposed action effects complies with the National Environmental Policy Act (NEPA) requirements given the respective power plant licensing and land jurisdictions within the BLM. The social and economic impact analyses evaluate project-related changes on the existing local population and economy (including employment and the relationship to local housing conditions). The economic impacts of the BSPP-related construction and operation spending of the BSPP and other related socioeconomic impacts are also estimated. The proposed action's projected peak employment is used to analyze worst-case construction employment impacts to the local communities, their social character and their economies. The potential effects to the local area's social character are evaluated based on the findings of the economic impact analysis.

The impacts on public services related to health and safety (e.g. police protection, fire protection and emergency medical services) are analyzed in Section 4.11, *Impacts on Public Health and Safety*. Potential effects on parks and recreational opportunities are considered in Section 4.12, *Impacts on Recreation*.

The Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the NEPA (40 CFR Part 1500 - 1508) provides no specific thresholds of significance for socioeconomics impact assessments. Significance varies, depending on the setting of the proposed action (40 CFR 1508.27[a]), but 40 CFR 1508.8 states that indirect effects may include those that are growth-inducing and others related to induced changes in the pattern of land use, population density, or growth rate.

An input-output model (IMPLAN) was used to estimate the indirect economic impacts associated with construction- and operation-phase expenditures resulting from the BSPP that would benefit the eastern Riverside County region.

The cumulative impact analysis evaluated the socioeconomic impacts of the future combined implementation of the Solar Project identified in the Cumulative Project Scenario discussed in Section 4.1.

4.13.2 Discussion of Direct and Indirect Impacts

Proposed Action

Construction

Construction employment and spending for the proposed action would be the primary direct economic impact associated with the BSPP. As such, the construction employment and related spending effects would be a temporary impact lasting for the anticipated 69-month duration of the construction period. Given the absence of any significant current economic use of the site, the

construction activities associated with the proposed action would represent a beneficial economic impact adding new employment and spending to the local economy.

Economic

As discussed in greater detail in Section 3.14, *Social and Economic Setting*, the origin of BSPP construction workers is a central factor determining the magnitude and extent of potential socioeconomic impacts to the local economy and communities associated with the proposed action. The direct benefits of employment and higher personal incomes primarily would benefit the communities from which construction workers and their families reside, since construction workers would likely spend the majority of their earnings in these communities. The workers' spending for goods and services would have an indirect socioeconomic impact on the communities and economies where that spending occurs. In addition, if there is an insufficiency of suitable local workers to staff the BSPP, then the BSPP could attract individuals to relocate to the area (either temporarily or permanently), which could consequently result in an increased demand for housing and local services. If there is insufficient housing or service capacity, then adverse indirect social and economic impacts could result. People permanently (or in some cases even only temporarily) moving into the area for work could encourage the construction of new homes, extension of roads and/or other infrastructure development and/or could increase the existing demand for public services. Informal worker lodging or camping in the local area would likely be a particular concern. Given the relatively long commute distances that some workers could face, some could seek to save travel-related time and costs by choosing to camp at existing public camp sites or, informally, on nearby public or private lands.

Project Construction Labor Needs

The availability of the local and regional workforce to meet the BSPP's construction labor needs has been analyzed to determine whether the BSPP would induce population growth. Consistent with the geographic demarcations for the local and regional study areas, the "local workforce" consists of employable residents living in relatively close proximity to the site (i.e., the cities of Blythe, California or Quartzite, Arizona; or the community of Ehrenburg, Arizona).[1] The "regional workforce" consists of all potential employable adults currently living up to a two-hour commute (one-way) to the site. As discussed in Section 3.14 and shown in Figures 3.14-1 and 3.14-2, the regional labor force consists of the employable adults living in the cities west of the site along I-10 as far as, and including, the City of Palm Springs.

The Applicant expects that construction would last 69 months, with an average of about 604 daily construction workers with a peak employment of 1,004 workers during month 16 of construction (Solar Millennium 2009a, p. 5.11-24). Generally, increased employment represents a beneficial economic impact on local communities from the new job opportunities and increased income generated for the local economy. However, in rural areas such as Blythe and/or projects with more skilled/specialized job requirements, increased labor demand can have adverse indirect

[1] In addition, residents living in the unincorporated areas near these communities or within an hour's commute of the project would also be considered local labor force. However, given the very limited data on the unincorporated residents, it is conservatively assumed that all the unincorporated population identified in Section 3.14 are regional but not local residents.

socioeconomic impacts on the local communities if it causes significant in-migration that the existing local housing, infrastructure and/or other public services cannot support. The estimated peak employment of 1,004 is used to analyze worst-case construction employment related impacts from potential in-migration.

Labor Force Supply

Table 4.13-1 shows Year 2006-2016 occupational employment projections for the Riverside/ San Bernardino/Ontario MSA[2] by construction labor skill as compared to the estimated number of total construction workers by craft needed during the peak month (month 14) as presented in the Application for Construction (AFC) (Solar Millennium 2009a, p 5.11-26). The primary trades required for construction of the proposed action will include pipefitters, skilled and unskilled laborers, electricians, carpenters, cement finishers, equipment operators, ironworkers, and truck drivers.

Table 4.13-1 shows that there is a very large population of suitably skilled construction workforce for the proposed action currently living within Riverside and San Bernardino Counties.[3] However, only a portion of these workers could be expected to be currently living within the region. Based on the regional study area's estimated 2010 population of 476,451 residents, compared to a corresponding Riverside and San Bernardino population of 4,212,684, the regional study area's skilled labor force would total approximately 11.3 percent of the skilled workforce shown in Table 4.13-1. Overall, that would suggest a total skilled labor force of approximately 14,665 workers (11.3 percent of approximately 130,000 total skilled construction workers)[4] living within the regional study area.

Applying the current local unemployment levels of 12.7 percent within the regional study area would suggest that approximately 1,860 unemployed skilled workers may currently reside in the regional study area. Compared with the required average project employment need of 604 workers, the proposed action could employ up to approximately 32.5 percent of the estimated currently unemployed construction workers. During peak construction, 1,004 workers would be needed, which would employ up to nearly 54 percent of the estimated available unemployed skilled workforce. While this would represent a major proportion of the region's skilled workforce, there also could be individuals amongst the region's estimated nearly 22,500 unemployed (i.e., 24,340 total regional unemployed – 1,860 regional skilled unemployed construction workers) that have or could obtain the necessary training to perform the facility construction. Also, it is likely that some of the currently employed skilled local construction workers would change their jobs in order to work closer to home and their positions would be filled by other workers living outside of the regional study area.

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2 Metropolitan Statistical Areas (MSA) are geographic entities defined by the U.S. Office of Management and Budget (OMB) for use by Federal and State statistical agencies in collecting, tabulating, and publishing socioeconomic statistics. The Riverside/San Bernardino/Ontario MSA consists of Riverside and San Bernardino Counties combined. As such, the MSA population and labor force estimates include a major portion of individuals residing outside the likely daily commuting range from the site.

3 Given its more rural character and the far smaller size of its labor force, only a very minor proportion of future construction workers would be expected to originate from La Paz County in Arizona. For this analysis, it is conservatively assumed that all construction workers for the BSPP would be California residents.

4 Using the average of 2006 and 2016 skilled labor force estimates shown the Table 3.14-1.

TABLE 4.13-1
TOTAL LABOR BY SKILL IN RIVERSIDE/SAN BERNARDINO/ONTARIO MSA (2006 and 2016 Estimate) AND PROJECT REQUIRED CONSTRUCTION BY CRAFT PEAK MONTH

Trade	Total # of Workers for Project Construction by Craft – Peak Month	Riverside/ San Bernardino/Ontario MSA 2006	Riverside/ San Bernardino/Ontario MSA 2016
Surveyor	16	1,420	1,670
Operator	94	4,790	5,460
Laborer	229	27,930[a]	32,080[a]
Truck Driver	28		
Oiler	4		
Tradesman	8		
Carpenter	77	28,850	32,390
Boilermaker	9	4,630[b]	5,330[b]
Pipe Fitter	290		
Paving Crew	0	630	720
Electrician	81	6,740	7,600
Cement Finisher	80	4,110	4,690
Ironworker	42	19,460	20,800
Millwright	18	2,630[c]	2,960[c]
Construction Manager	2	4,380	5,110
Project Manager	2	10,990[d]	12,380[d]
PM Assistant	2		
Timekeeper	2		
Administrator	5		
Support	2	120[e]	130[e]
Support Assistant	2		
Engineer	7	1,370	1,600
Welder	1	3,960	4,640
Total	***1,001***	***122,010***	***137,560***

NOTES:
[a] "Construction Laborers" category was used.
[b] "Plumbers, Pipefitters, and Steamfitters" category was used.
[c] "Machinists" category was used.
[d] "Supervisors, Construction and Extraction Workers" category was used.
[e] "Helpers - Construction Trades" category was used.

Source: Solar Millennium 2009a, Tables 5.11-8, 5.11-11, and 5.11-17.

Consequently, it is expected that most, if not all, of the construction employment for the BSPP would consist of construction workers who live within a two-hour commute from the site. Employee ride sharing, and the relatively long duration of the work would likely encourage workers to commute considerable daily distances to work on the project.

Housing and Lodging Impacts within the Local Study Area

As shown in Table 3.14-2, the current published vacancy rates for the cities of Blythe, California; Ehrenberg, Arizona; and Quartzsite, Arizona are 16.1, 34.9, and 41.9 percent, respectively. These

vacancy rates indicate that some currently vacant housing could be available for construction workers who choose to relocate within the local study area. Altogether, it is conservatively estimated that up to approximately 2,480 existing housing units could be available as potential housing for future construction workers (this estimate does not account for other potential available housing within the unincorporated local study area). The extent to which construction workers choose to rent local housing would depend on the rental prices and the condition of the available housing. Especially if construction workers would be willing to share rental accommodations, rental housing could be an option for workers wishing to relocate or, more likely, commute weekly to work at the site.

In addition, as discussed in Section 3.14, analysis of the current motel and hotel businesses and their occupancy rates suggests that lodging could be available to accommodate construction workers who choose to stay temporarily at a local motel or hotel to be close to the site. There are approximately 1,000 hotel/motel rooms within the local study area (i.e., the Cities of Blythe and Quartzite and community of Ehrenburg) (AS 2009a, p. 5.11-27).

Other lodging opportunities also could be available at privately-owned RV/campgrounds and public campground areas within the local study area. However, during the high season (December to March) these facilities can be popular with visitors and, therefore, could have only limited availability for construction workers. In addition, most of the public campgrounds (including the BLM administered Long Tern Visitor Areas) are intended for recreational use; construction workers might not be permitted to use these areas. Consequently, it is unlikely that the RV/campgrounds would be very suitable or attractive lodging options for most BSPP construction workers who seek local accommodations.[5] However, the BLM may allow temporary LTVAs to be established at the Project site for project employees for the duration of project construction.

Furthermore, particularly during the non-winter season, it is likely that there would be considerable housing opportunities within the local area for construction workers seeking temporary accommodations. Lodging facilities within the local study area could include both rental housing for workers seeking longer term local housing and motel lodging for those looking for more occasional or shorter stay accommodations. The relatively high vacancy rates also would ensure that any BSPP-related temporary housing needs would be met with existing housing or lodging facilities. As a result, no new housing or motel development would be expected to be induced by the proposed action and the increased use of these under-utilized housing or motel lodging would be considered beneficial for local property owners.

Construction Worker Expected Commuting Patterns

Given the major skilled labor force residing within the areas of Riverside and San Bernardino Counties, and the common construction worker commuting habits (EPRI, 1982; CEC, 2010), it is reasonable to expect that BSPP construction workers residing outside the regional study area would commute weekly to the local area rather than in-migrate with their families. Consequently,

[5] Except for construction workers that already own their own RV or camper trailers.

any such workers who choose to reside temporarily in the local area would have a limited service impact on local services and infrastructure. Furthermore, given that existing housing and/or lodging facilities would be used to accommodate the few (if any) construction workers who choose to stay temporarily in the local area, the local transient occupancy tax revenues, local rental home owners' property, and/or business taxes payments should account for their limited local infrastructure and public service usage.

Therefore, it is concluded that the proposed action would not induce substantial growth or concentration of population in either the regional or local study areas. Furthermore, construction of the proposed action would not encourage people to relocate to the area and, thereby, result in new and unplanned growth or land use changes.

Construction Spending Impacts

Construction of the proposed action would create a temporary, positive impact on the local economic base and fiscal resources. Construction workers wages and salaries would provide additional income to the area, as would expenditures within the local and regional study areas for construction materials and services. An IMPLAN input-output model was used to estimate economic impacts within eastern Riverside County based on the construction-phase BSPP-related expenditures that would be expected to occur within the regional study area.

IMPLAN is an economic impact modeling tool that uses region-specific input/output accounts by industry to estimate secondary impacts of economic changes. Secondary impacts include: (1) indirect impacts that occur due to the purchase of goods and services by firms involved with construction and operation; and (2) induced impacts, which result from household spending by project- related employees. Secondary impacts can occur in the form of employment, income, output, and taxes.

Social Accounting Matrices (SAM) multipliers were used for the impact analysis. SAM multipliers are recommended by the writers of the IMPLAN software because an induced effect estimate using a SAM multiplier is based on information in the social account matrix, which accounts for social security and income tax leakage, institution savings, and commuting. The multipliers for the impact analyses for the proposed action were derived based on specific industry data for the Riverside County study area in the IMPLAN Professional input/output relationships to represent the direct economic impacts associated with the proposed action (e.g., estimated annual construction cost and annual operation cost). Zip code level IMPLAN data was obtained to enable both Riverside County and sub-County area analysis of the spending impacts from future project construction and operation. IMPLAN Sector 36, "Construction of other new non-residential structures," was selected as the IMPLAN sector most closely corresponding to the North American Industry Classification System Code 21, which is used for "Power plants, new construction." All figures are in presented in 2010 dollars. Table 4.13-2 summarizes the IMPLAN analysis findings.

The proposed construction labor payroll has been estimated at approximately a total of $406 million over 69 months ($70.6 million estimated annually). Capital expenditures and local spending on construction materials, equipment, and service are estimated to total approximately

TABLE 4.13-2
BSPP CONSTRUCTION ECONOMIC BENEFITS (2010 Dollars)

Fiscal Benefits	
State and local sales taxes	$9.9 million ($1.72 million average per year)
BSPP Construction Spending	
Labor	$406.0 million ($70.6 million average per year)
Materials, equipment and services	$60.0 million ($10.4 million average per year)
Total	$466.0 million ($81.0 million average per year)
Direct, Indirect, and Induced Benefits	
Direct	
Economic Output	$466.0 million ($81.0 million average per year)
Jobs	604 jobs (monthly average)
Indirect	
Economic Output	$86.2 million ($15.0 million average per year)
Jobs	108 jobs
Induced	
Economic Output	$243.8 million ($42.4 million average per year)
Jobs	354 jobs
Total	
Economic Output	$796.0 million ($138.4 million average per year)
Jobs	1,066 jobs

SOURCE: Solar Millennium, 2009a; ESA, 2010.

$60 million over 69 months ($10.4 million estimated annually). For this analysis, it was assumed that the construction material and equipment purchases would include standard construction materials and services that would mostly be obtained from within the IMPLAN study area.[6] These BSPP expenditures were used to estimate the economic benefits to the local and regional economies. The IMPLAN model also assumes that all of the construction workers for the proposed action would be from within the regional study area of eastern Riverside County.

The proposed solar facility construction is expected to directly create an average of 604 annual full-time employees over 69 months, with a peak monthly employment of 1,004 full-time employees. This new employment would create both indirect and induced secondary employment in the regional study area. Indirect employment is defined as employment that would be generated by the purchase of goods and services required for the facility's development. Induced employment is defined as employment that would be generated by the purchase of goods and services by businesses that are indirectly supported by the proposed action.

6 The costs for specialized solar materials and equipment (e.g., panels) that would have to be purchased from outside Riverside County are not included, since their acquisition from out-of-County or out-of-State suppliers/manufacturers would have minimal economic benefit to local or regional businesses.

As shown in Table 4.13-2, according to the IMPLAN analysis, construction of the BSPP could be expected to have the direct beneficial economic impact of generating an average of $70.6 million in annual spending on construction labor within the regional study area for the duration of the construction period. In addition, on average, approximately $10.4 million would be spent annually on construction materials, equipment, and services from businesses within the regional study area. Together, the construction spending is expected to generate up to an additional $47.4 million per year in indirect and induced economic output for other businesses in eastern Riverside County.

The actual future economic impact for eastern Riverside County could be smaller than the total economic benefits shown in Table 4.13-2. BSPP-related spending would benefit eastern Riverside County and the local economies depending on the extent that workers live and spend their earnings at businesses locally and elsewhere in eastern Riverside County. Given the local study area's rural character, most of the projected benefits would likely be received by the larger cities and communities located elsewhere in eastern Riverside County, outside the local study area. The economic benefits to both local and regional businesses could be less than those estimated by the IMPLAN model if greater sales leakage occurs assumed for by the IMPLAN model. Irrespectively, the net short-term economic impact on the local and regional economies would be considerable.

In terms of economic output impacts, the primary local industries that would benefit the most include the following: rental housing, architectural and engineering services, wholesale and retail trade businesses, real estate establishments, physicians and other medical professionals, food service, and hotel/motel businesses.

Social

The potential for BSPP-related impacts to the local study area's social character are determined by the nature of economic impacts of the construction activity and any BSPP-related in-migration.

As discussed above, construction of the BSPP could be expected to generate considerable economic benefits directly for both construction workers and local businesses providing materials and services for construction. In addition, major indirect and induced spending benefits for the local and eastern Riverside County economies would be generated by subsequent spending of the construction workers and construction businesses' income within the local and regional economy. The economic benefits are expected to extend widely within the local and regional economy but would most benefit food, retail, lodging, real estate, and medical related businesses.

The additional new income for the local economy from the BSPP would have a positive, but short-term, contribution towards supporting local business and maintaining the economic vitality of the City of Blythe and other neighboring communities. The positive effect for the local economy would be increased given the local study area's recent and on-going economic weaknesses as a result of both longer term changes and the more recent economic downturn. The continued viability of Blythe's local business community is essential for its long term well-being. Increased local employment opportunities would improve local residents' standard of living and will help retain younger residents who otherwise would be more likely to leave the community if

there are insufficient local employment opportunities. The local community's positive social attitudes to the proposed action may generally be expected to increase based on the extent that local residents are employed (either directly or indirectly) or otherwise benefit from the BSPP.

BSPP-related in-migration of new residents could affect the social character of the local study area. An influx of new individuals with different values, lifestyles, and/or socio-demographic backgrounds could have a positive or negative influence on the quality life and/or community values. The existing community members' attitudes and opinions to any such changes could vary greatly among individuals. However, in general, the magnitude of the in-migration would need to be relatively substantial for the social environment to be noticeably altered. Furthermore, social changes typically require, or are most commonly associated with, permanent changes to the community's composition and/or attitudes rather than as the result of short-term influences or changes.

As discussed above, the majority of construction workers for the BSPP would be expected to commute daily to the site. Given that most workers would likely travel to the site from their homes located west of Blythe, local residents may have little daily interaction with most workers. It is possible that some construction workers could chose to commute weekly from their homes and stay within the local area at local hotels/motels or perhaps rent homes. In this case, after the workday is over, these individuals would be more likely to interact with existing residents at local businesses or community facilities. However, given the very limited number of construction workers expected to stay in the local area during the work week, the presence of these individuals would not be expected to result in substantial or long-term adverse effects to the local area's social composition and character.

Therefore, in general, given the expected new local employment opportunities and economic benefits to local business and relatively limited temporary in-migration of construction workers, most local residents and stakeholder groups would be expected to be supportive or, at a minimum, would not oppose the solar facility's construction. Consequently, the BSPP would be expected to have a minor and largely positive impact on the social character of the local study area for the temporary duration of facility construction.

Alternatives

Reconfigured Alternative

The construction spending and employment for the Reconfigured Alternative is expected to be comparable to those for the proposed action and, consequently, the social and economic impacts would be similar.

Reduced Acreage Alternative

Construction spending and employment for the Reduced Acreage Alternative would be expected to be lower than for the proposed action and, consequently, the social and economic impacts would be similarly reduced in magnitude.

No Action Alternative A

The social and economic impacts associated with the proposed action would likely only be delayed by selecting No Action Alternative A, since this region of the United States has extremely positive characteristics for solar power generation. If the proposed action were not approved, another application for a different solar generating facility or a different type of solar generating facility would likely be filed at some time in the future. An application could also be filed for a wind energy facility or any other kind of use and impacts would result based on the specific use requested.

No Action Alternative B

The social and economic impacts resulting from the proposed action would not occur under No Action Alternative B since the application would be denied and the subsequently amended plan would identify the land as unsuitable for solar energy generation. However, the land would remain open to other types of rights-of-way and/or land use authorizations, resulting in potential impacts specific to a future use other than solar energy generation.

No Action Alternative C

Impacts associated with the proposed action would likely only be delayed under No Action Alternative C, since this region of the United States has extremely positive characteristics for solar power generation. If this proposed action were not approved, another application for a different solar generating facility would likely be filed at some time in the future.

Operation

Economic

As discussed in greater detail in Section 3.14, the origin of BSPP workers is a central factor determining the magnitude and extent of potential socioeconomic impacts to the local economy and communities from the proposed action. The direct benefits of employment and higher personal incomes primarily would benefit the communities where the workers and their families reside, since that would likely be where they spend the majority of their earnings. Workers' spending for goods and services would have an indirect on the communities and economies where that spending occurs. In addition, if there are an insufficient number of suitable local workers available to staff the BSPP, then the BSPP could attract individuals to relocate to the area, which, in turn, could result in an increased demand for housing and local services. If there is insufficient housing or service capacity to meet the new demand, then adverse indirect social and economic impacts could result.

For this analysis, the BSPP would "induce substantial population growth" if workers permanently (or in some cases even only temporarily) move into the local area for employment at BSPP facilities and, thereby, encourage the construction of new homes, extension of roads, other infrastructure development, and/or increase demand for public services.

Project Operations Labor Needs

The employment and spending by the proposed action's future operations would be the primary direct long-term economic impact associated with the BSPP. The proposed action is expected to require a total of 221 permanent full-time employees (Solar Millennium 2009a, p. 5.11-29). Table 4.13-3 shows Year 2006-2016 occupational employment projections for the Riverside/ San Bernardino/Ontario MSA by operational labor skill as compared to the estimated number of total operational workers needed (Solar Millennium 2009a, p. 5.11-29).

TABLE 4.13-3
TOTAL LABOR BY SKILL IN RIVERSIDE/SAN BERNARDINO/ONTARIO MSA (2006 and 2016 Estimate) AND PROJECT REQUIRED OPERATION

Trade	Total # of Workers for Project Operation	Riverside/ San Bernardino/Ontario MSA 2006	Riverside/ San Bernardino/Ontario MSA 2016
Maintenance and Repair Workers, General	--	11,920	13,690
Plant and System Operators	--	2,030	2,380
Total	***221***	***13,950***	***16,070***

SOURCE: Solar Millennium 2009a, Tables 5.11-8 and 5.11-11.

Approximately half the operations jobs would be lower skilled positions. All employees would be provided with necessary training. The basic job requirements for the lower skilled operations workers would likely be high school diplomas and basic mechanical equipment operating abilities. Former agricultural equipment operators, construction laborer, and many other manual labor jobs would be expected to have transferrable skills.

The other more skilled operations would generally require some secondary education and greater mechanical/electrical equipment experience than the lower skilled operation position. Project construction workers and more experienced farm or other equipment operators would be expected to have transferrable skills suitable to those required for these positions. On-the-job training could be expected to enable, over time, some lower skilled employees to gain the expertise necessary to staff the more skilled operations positions. In addition, local community colleges (Palo Verde College in Riverside and College of the Desert in Palm Desert) as well as University of California - Riverside have recently developed Utility Job Training Courses with federal funding support specifically designed to provide its students with the training necessary to qualify for the higher skilled operations jobs.

As shown in Table 4.13-3, data for the Riverside/San Bernardino/Ontario Metropolitan Statistical Area (MSA) indicates that in the 2006, the "Maintenance and Repair Workers, General" and "Plant and System Operators" employment sector contained a total of 13,950 workers, with 2016 forecasts for these employment sectors to grow to a total of 16,070 employees. The existing labor force of currently qualified plant and system operators within Riverside and San Bernardino counties is relatively limited and likely reflects the current level of available employment

opportunities. As discussed in the previous estimate of the proportion of construction work living in the regional study area, on a per capita basis, it may reasonably be assumed that approximately 11.3 percent of these Riverside MSA operators and general maintenance workers would live within the regional study area. These would correspond to approximately 1,700 maintenance workers and plant operators,[7] of which, based on the regional unemployment levels, approximately 215 would be expected to be currently unemployed.

While the need for 110 more skilled plant operators for the facility's future operations would likely exceed the region's existing supply of unemployed plant operators and would also correspond to more than half the estimated unemployed general maintenance workers in the region, there would also be individuals amongst the region's estimated other nearly 24,125 unemployed (i.e. 24,340 total regional unemployed – 215 unemployed general maintenance / plant operators) that have or could obtain the necessary training to perform the facility operations. Also, it is likely that some of the currently employed workers would change their jobs to obtain a better paying job and/or to work closer to home. Given the region's high unemployment levels, any currently employed worker switching jobs could expect to have their vacated position filled by other workers (possibly including others living outside of the regional study area).

According to the Applicant, at least 75 percent of workers would be expected to come from within the regional study area workforce (AFC, p. 5.11-29), resulting in a potential influx of up to 55 workers in communities within the proposed action's regional and local study areas (Solar Millennium 2009a). Consequently, it is expected that most of the facility's operations employment would be provided by workers living within the regional study area from the site. Future BSPP-related in-migration may occur but would be expected to be very minor with at most 55 employees relocating to the local study area. Furthermore, depending on the success of local training programs and possible interest amongst project construction workers or other more skilled local residents, actual in-migration may be lower or unnecessary except for a few top plant management and supervisory positions.

Housing Impacts within the Local Study Area

There would be greater incentive for future operations workers to live closer to the site since the operations job opportunities at the solar facility would be permanent positions. These operations jobs also could encourage workers to seek permanent homes in the local area. As shown previously in Table 4.13-2, the most current published vacancy rates for the cities of Blythe, California; Ehrenberg, Arizona; and Quartzsite, Arizona are 16.1, 34.9, and 41.9 percent, respectively. These vacancy rates indicate that there is likely currently considerable vacant housing, which could be available to future operations workers who choose to relocate to the local study area. Altogether, it is conservatively estimated that up to approximately 2,480 existing housing units could be available as potential housing for future construction workers (the estimate does not account for other potential available housing within the unincorporated local study area).

[7] Using the average of 2006 and 2016 skilled labor force estimates shown the Table 4.13-3.

Currently, home and rental prices within the City of Blythe and the other communities within the local area are relatively affordable and there is considerable available housing supply. These vacancy rates and the relatively minor number of BSPP employees likely seeking local housing indicates that more than sufficient existing local housing would be available for any future operational employees choosing to relocate to the local area. Therefore, no new housing or infrastructure growth would be necessary to provide housing or public services for the BSPP's operations workforce.

Future facility operations would encourage, at most, a small number of people to relocate to the area. The small magnitude of the potential action-related in-migration would be readily accommodated by the local area's existing housing and, consequently, would not result in new and unplanned growth or land use changes. Therefore, it is concluded that the proposed action would not induce substantial growth or concentration of population in the local study areas.

Consequently, the BSPP's future operations would not be expected to result in population growth either directly or indirectly that would be major in magnitude or adverse in nature.

Operations Spending Impacts

The future facility operations would have a long-term, positive impact on the local economic base and fiscal resources. Operations workers' wages and salaries would provide additional income to the area, as would expenditures within eastern Riverside County for construction materials and services.

As discussed in the construction spending impact analysis, an IMPLAN input-output model was used to estimate the indirect and induced economic impacts for eastern Riverside County based on the operation-phase BSPP expenditures that would be expected to occur within the regional study area.

The same IMPLAN model was used to estimate the BSPP's operations impact on the eastern Riverside County economy although IMPLAN Sector 31, "Electric power generation, transmission, and distribution," was used to estimate spending impacts for operations labor since it most closely corresponds to the North American Industry Classification System Code 221119, which is used for, "Electric power generation: solar." For this analysis, it was assumed that the operations material and equipment purchases would be for standard construction materials and services that would mostly be obtained from within the IMPLAN study area. These BSPP expenditures were used to estimate the economic benefits to the regional study area economy. The IMPLAN model also assumes that all of the BSPP's operations workers would reside within the regional study area of eastern Riverside County.

BSPP operations would create a permanent, positive impact on the local economy and fiscal resources. Operations employees' salaries would provide additional income to the area, as would expenditures within the multi-county study area for operations and maintenance materials and services. Table 4.13-4 summarizes the IMPLAN analysis findings for the future BSPP operations.

TABLE 4.13-4
BSPP OPERATIONS ANNUAL ECONOMIC BENEFITS (2010 Dollars)

Fiscal Benefits	
Estimated annual property taxes	$400,000[1]
State and local sales taxes	$1,600,000
School Impact Fee	$0
Project Operations Spending	
Labor	$9.4 million
Operations and maintenance supplies	$9.6 million
Total	$19.0 million
Direct, Indirect, and Induced Benefits	
Direct	
Economic Output	$19.0 million
Jobs	221 jobs
Indirect	
Economic Output	$2.3 million
Jobs	16 jobs
Induced	
Economic Output	$6.9 million
Jobs	58 jobs
Total	
Economic Output	$18.4 million
Jobs	295 jobs

NOTES:
[a] At present, there is no property tax assessed on solar components (mirrors, solar boiler, heat exchangers) improvements by law (Section 73 of the California Taxation and Revenue Code). Components included under the exemption include storage devices, power conditioning equipment, transfer equipment, and parts. The first operational year would generate an estimated $400,000 in annual property taxes.

SOURCE: Solar Millennium, 2009a; ESA, 2010.

The annual expenditures of the BSPP were assumed to be $9.6 million for materials, equipment, and supplies; and $9.4 million in payroll annually. These figures were used as inputs into the model to predict economic and employment impacts.

BSPP operations are expected to directly employ 221 full-time employees. This employment would create both indirect and induced secondary employment in the region. Indirect employment is defined as employment that would be generated by the purchase of goods and services required by the BSPP. Induced employment is defined as employment that would be generated by the purchase of goods and services by businesses that are indirectly supported by the BSPP.

As shown in Table 4.13-4, according to the IMPLAN analysis, BSPP operations could have the direct beneficial economic impact of generating a total of $19.0 million in annual spending on labor and materials within eastern Riverside County. This operations spending would be also

expected to generate up to $9.2 million in new indirect and induced economic output and earnings for other businesses and residents within eastern Riverside County.

The actual future economic impact for eastern Riverside County could be smaller than the total economic benefits shown in Table 4.13-2. BSPP related spending would benefit eastern Riverside County and the local economies depending on the extent that workers live and spend their earnings at businesses locally and elsewhere in eastern Riverside County. Given the local study area's rural character most of the projected benefits likely would be received by the larger cities and communities located elsewhere in eastern Riverside County outside the local study area. The economic benefits to both local and regional businesses could be less than estimated if greater sales leakage occurs than that expected by the IMPLAN model. Irrespectively, the net annual economic impact would be a minor and positive benefit on the local and eastern Riverside County economies.

In terms of economic output impacts, the primary local industries that would benefit the most include: rental housing, architectural and engineering services, wholesale and retail trade businesses, real estate establishments, physicians and other medical professionals, and food service businesses.

Social

The potential for proposed action-related impacts to the local study area's social character are determined by the nature of economic impacts of the BSPP and any related in-migration.

As discussed above, the BSPP could generate considerable economic benefits directly for both workers and local businesses providing materials and services for the project. In addition, major indirect and induced spending benefits for the local and eastern Riverside County economies would be generated by subsequent spending by the workers and businesses income within the local and regional economy. The economic benefits are expected to extend widely within the local and regional economy but would most benefit food, retail, lodging, real estate, and medical-related businesses.

The additional new income for the local economy from the BSPP would have a positive contribution towards supporting local business and maintaining the economic vitality of the City of Blythe and the other neighboring communities for the lifetime of the project. The positive effect for the local economy would be increased given the local study area's recent and on-going economic weaknesses as a result of both longer term changes and the more recent economic downturn. The continued viability of Blythe's local business community is important for the City's long-term well-being. Increased local employment opportunities would improve local residents' standard of living and would help retain younger residents that otherwise would be more likely to leave the community if there are insufficient local employment opportunities. The extent of the local community's positive social attitudes towards the BSPP could be expected to increase as more local residents gain employment (either directly or indirectly) or otherwise benefit from the BSPP.

Project-related in-migration could affect the social character of the local study area. An influx of new individuals with different values, lifestyles and/or socio-demographic backgrounds could have a positive or negative influence on the quality life and/or community values. The existing community members' attitudes and opinions to any such changes could vary greatly between individuals. However, generally, the magnitude of the in-migration would need to be relatively substantial to noticeably alter the prevailing social environment. Furthermore, social changes typically require or are most commonly associated with permanent changes to the community's composition and/or attitudes rather than as the result of short-term influences or changes.

The majority of the facility's permanent workforce is expected to commute daily to the site. Given that most workers would likely travel to the site from their homes located west of Blythe, local residents would have little daily interaction with most workers. It is possible that some workers would choose to commute weekly from their homes and stay at local hotels/motels or perhaps rental homes. In the latter case, before or after the workday is over, these individuals would be more likely to interact with existing residents at local businesses or community facilities. However, given the very limited number of workers expected to stay in the local area during the work week, their presence would not be expected to result in substantial or long-term adverse effects to the local area's social composition and character.

Therefore, generally, given the expected new local employment opportunities and economic benefits to local business and relatively limited in-migration of permanent workers, most local residents and stakeholder groups would be expected to be supportive or at a minimum not opposed to BSPP operation. Consequently, the proposed action is expected to have a minor impact and largely positive impact on the social character of the local study area's economy for the 30-40 year duration of the BSPP.

Alternatives

Reconfigured Alternative

The operations spending and employment for the Reconfigured Alternative would be expected to be comparable to those for the proposed action and, consequently, the social and economic impacts would be similar.

Reduced Acreage Alternative

The operations spending and employment for the Reduced Acreage Alternative would be expected to be reduced from that for the proposed action and, consequently, the social and economic impacts would be similarly lesser in magnitude.

No Action Alternative A

The social and economic impacts associated with the proposed action would likely only be delayed by selecting No Action Alternative A, since this region of the United States has extremely positive characteristics for solar power generation. If this proposal were not approved, another application for a different solar generating facility or a different type of solar generating

facility would likely be filed at some time in the future. An application could also be filed for a wind energy facility or any other kind of use and impacts would result based on the specific use requested.

No Action Alternative B

The social and economic impacts resulting from the proposed action would not occur under No Action Alternative B, since the application would be denied and the amended plan would classify the land as unsuitable for solar energy generation. However, the land would remain open to other types of rights-of-way and/or land use authorizations, resulting in potential impacts specific to a future use other than solar energy generation.

No Action Alternative C

Impacts associated with the proposed action would likely only be delayed by selecting No Action Alternative C, since this region of the United States has extremely positive characteristics for solar power generation. If this proposed action were not approved, another application for a different solar generating facility would likely be filed at some time in the future.

Decommission

Economic

The anticipated lifespan of the BSPP is estimated to be 30 to 40 years. Closure- and decommissioning-related social and economic impacts would be related to both the discontinuation of the solar operations and the short-term effects of the necessary facility deconstruction and subsequent site reclamation activities.

The direct economic impact associated with discontinuation of the solar energy generation site would result in job losses for the operations workforce, which would no longer be needed to maintain the facility's daily operations and/or repair the solar power generation equipment and related infrastructure. Closure would also directly reduce future revenues to any local material, equipment, and service suppliers previously supporting the facility's daily operations.

In addition, closure would have the additional adverse economic effect of reducing the employment and revenues for other local or regional businesses that rely on spending by the BSPP's operations staff or suppliers. As a result of the reduced income and revenues of these affected businesses, the BSPP's staff and support businesses would make few purchases from other local businesses, which, in turn, would reduce these businesses and its employees' income and purchasing ability.

Deconstruction activity could, however, result in a short-term increase in local spending from the employment, equipment, and materials required to both dismantle the solar facility and reclaim the site. The cost and duration for the deconstruction activities is likely to be roughly comparable to that of the construction; except that the amount of labor and materials would be less than that required for the facility development because the facility would not need to be operational. The

magnitude and duration of the resulting short-term economic benefits would likely be proportional to the extent of the deconstruction activity required for the facility's removal. The economic benefits to the local and regional economy would also likely be of a similar type and magnitude as those projected for construction, unless there is significant change to the local and regional economy during the interim period.

Given a reasonable expectation of considerable increased solar-related local business development and employment, it could be expected that there would be an increased number and variety of businesses that could provide necessary solar-related services. This would, in turn, ensure that the local and regional economies would be able to retain a greater proportion of benefit from the future decommissioning spending since a smaller proportion of the work would be performed by out-of-region businesses and, hence, leak out the region's economy.

Consequently, the economic impacts associated with the ultimate decommissioning could be initially positive from the increased employment and business spending over the relatively brief duration of the deconstruction and site restoration activities. However, following the completion of the decommissioning process, there would be minor adverse long-term economic impacts to the local economy from the lost of the solar facility's employment and annual spending.

Social

As discussed in the economic analysis above, ultimate closure and decommissioning would result in the reduced local employment opportunities and decreased revenues for businesses supplying the materials, equipment, and services required to operate and maintain the BSPP. In addition, there would be secondary economic losses for local residents and businesses that benefit from sales and employment by the BSPP employees and supplier businesses.

The potential for adverse social impacts would depend on the magnitude of the facility-related economic losses. Future decommissioning the proposed action alone would be expected to have, at most, a very minor adverse social impact. Given a reasonable expectation that a considerable number of other solar developments would occur within the region as well as an increase in other solar-related local business development and employment, the loss of an individual project would have a reduced potential to result in adverse social impacts. For substantial adverse social impacts to occur, the scale of employment and/or business economic losses would need to be of a type and magnitude that worker relocation and/or business closures would occur so that the local quality of life is reduced or the local communities' social character is adversely altered. Furthermore, the potential for adverse social impacts could be significantly reduced or eliminated if proposed decommissioning is anticipated and planned appropriately. In addition, the potential for adverse social impacts would also be significantly reduced if alternative employment and business opportunities develop, thereby reducing the economic impacts to the workers and businesses affected by the closure.

Consequently, future decommissioning of the BSPP could result at most in a very minor adverse long-term social impact from the reduced local employment and spending. It is also very possible that future decommissioning of the BSPP would result in a negligible adverse future social impact.

4.13.3 Discussion of Cumulative Impacts

The potential for cumulative socioeconomic impacts exists where there are multiple projects proposed in an area that have overlapping construction schedules and/or project operations that could impact similar resources. Projects with overlapping construction schedules and/or operations could collectively result in a demand for labor that cannot be met by the region's labor pool, which could lead to an influx of non-local workers and possibly their dependents. This population increase could impact social and economic resources if there are insufficient housing resources and/or infrastructure and public services to accommodate the new residents' needs.

Section 4.1 identifies current solar and non-solar projects which could be developed in the foreseeable future within both eastern Riverside County and elsewhere in Riverside County or the surrounding counties. While a large number of projects may be planned and, therefore, considered to be possible for future development, not all of them are expected to actually be built due to construction funding constraints, schedule, and/or delays. Many of the currently proposed projects in the local region anticipate participation in federal funding programs and/or assistance for project development. Given the uncertain and challenging economic circumstances facing both federal and state economies, it is far from assured that future funding and other governmental support will be sufficiently available for all the proposed projects within the projected schedules.

As shown in Table 4.4-1, currently more than a dozen BLM renewable energy projects are identified in the Cumulative Project Scenario for the social and economic analysis. In addition, six smaller BLM authorized actions are also identified. Finally, the Blythe Airport Solar 1 and Chuckwalla Valley Raceway projects are two other developments expected to occur or be completed within eastern Riverside County.[8]

There are 13 solar projects proposed along the I-10 corridor predominantly between Desert Center and Blythe. Based on the currently available data for these various projects (information obtained from Plans of Development and other project documents), and assuming all projects move forward, these projects would be constructed in the same general timeframe as the proposed action (i.e. between 2011and 2016).

The cumulative analysis conservatively assumes that all the proposed solar projects would be completed (or at least begin major construction) within the five-year cumulative timeframe. This cumulative impacts discussion is based on available data with respect to both construction schedules and the projects' labor requirements. If construction and operating labor requirements are not known for some projects, average work force levels of other comparable projects and professional judgments have been used to develop conservative estimates of expected cumulative labor requirements for these projects.

[8] The Chuckwalla Valley Raceway project is scheduled for completion in late 2010 and therefore would not be expected to add any significant construction labor need during the 2011 to 2016 cumulative analysis time period.

Economic

Construction

Cumulative Construction Labor Needs

If all of the 13 major BLM Solar Projects identified in eastern Riverside County are constructed, a total of 6,108 MW of new solar power would be developed. The average solar power project would be approximately 470 MW in size and may be expected to require approximately 1,926 full time equivalents (FTE) construction workers to be built.[9] Full build-out of all 13 BLM solar projects would require approximately 25,040 FTE of construction worker employment over the cumulative analysis's five year time-frame. This labor demand would be roughly equivalent to an average of 5,000 FTE of construction workers per year annual. This level of construction worker labor demand would represent the minimum employment impact on the regional study area since it assumes that all the BLM solar project construction work would be evenly performed over the five year period.

However, it will be solar projects' peak construction employment needs that would place the highest demand on the regional construction labor supply and have the greatest potential for cumulative socioeconomic impacts. The peak construction labor requirements for solar projects are estimated to average 1.86 workers per MW. In which case, during its period of peak construction, a typical 470 MW solar project would employ approximately 875 construction workers. Under the extremely improbable circumstance that peak construction of all 13 planned BLM solar projects happening concurrently, a maximum of 11,360 construction workers would be required in the region.

The actual cumulative construction labor force demand within the study region will be higher than the 5,000 FTE minimum and likely considerably lower than the 11,360 FTE maximum. The average construction period for BLM solar projects is estimated to be approximately 43 months or 3.6 years. Furthermore, project developers will likely seek to minimize the construction occurring during the hottest summer months and may stagger their construction periods accordingly. Consequently, some seasonality may be expected to occur as developers favor more construction during the region's cooler winter months. Therefore, conservatively assuming that all the projects would be completed with the five-year cumulative scenario period, the regional labor need for a realistic "worst case condition" would be for four projects to have peak labor needs during the same year.[10]

Given an average construction period of 3.6 years, it would be expected that at least nine of the 13 BLM solar projects would be occurring at any one time and, more likely, at least 11 would be ongoing during the expected peak labor demand period of 2012 to 2014. Therefore, the peak construction labor demand for the cumulative analysis is estimated to be equivalent to the total construction labor demand for seven solar projects under average construction conditions and four solar projects during peak construction. Altogether, such a rate of solar construction would

9 This is based on an estimated average construction labor need of approximately 4.1 construction workers (FTE) per MW of solar power production capacity.

10 The peak construction requirement typically occurs during mid-construction, suggesting that 2012 – 2014 would be most likely to experience peak labor demands.

be expected to require a total of 7,180 construction workers for the various BLM solar projects along the I-10 corridor during the years of major solar project development.[11]

In addition, there also could be demand for construction workers from the planned non-BLM solar project proposed for the Blythe Airport. This 100 MW solar project could contribute approximately 150 construction workers annually over the course of a multi-year construction period. The future construction needs of the various other non-solar projects on BLM land in the region are not known but, altogether, reasonably could be expected to have an annual construction labor need roughly comparable to another solar project (i.e., 530 construction workers).

Therefore, 7,880 construction workers is very conservatively estimated to represent the maximum possible future cumulative labor force demand from the region's planned solar and non-solar development. This estimate assumes all the identified projects would be developed within the five year cumulative analysis period.[12] The proposed action's maximum potential contribution to this cumulative effect would be approximately 12.7 percent during its peak construction period. The project's average contribution to the cumulative impact would be approximately 7.8 percent during its non-peak construction.

Regional Labor Force Supply

As discussed earlier in the social and economic analysis, the total work force of skilled construction workers currently living in eastern Riverside County is estimated to be approximately 14,665. Future demand for 7,880 construction workers would be equivalent to employment for more than half (53.7 percent) of the current skilled labor force. Such demand for construction workers far exceeds the current unemployed construction labor force. Approximately, an additional 850 skilled construction workers are currently expect to be added to the eastern Riverside County labor force by 2016 (based on past job projections shown in Table 4.13-1). The cumulative labor force demand would still represent more than half the region's currently forecasted future skilled construction labor force.

The current unemployed labor force within eastern Riverside County is estimated to be 24,340. The construction worker demand would represent approximately a 32.4 percent decrease in the regional study area's unemployment level. Although many of the region's currently unemployed residents may lack transferable skills or have the physical aptitude to acquire the necessary skills required by cumulative labor demand, many residents could be adequately trained to be employable. Furthermore, some of the construction work would be more entry-level positions which may be suitable for less skilled workers.

Some of the regional workforce currently employed in other sectors also could have the capabilities to qualify for BSPP construction work. In such cases, some job transferring may occur, especially since the construction jobs may be expected to be relatively well-paid and

[11] This assumes a typical 470 MW solar projects requiring 527 workers under average construction conditions and 873 workers during their shorter periods of peak construction.

[12] In actuality, construction labor shortages (and related wage escalation) would also be expected to become a possible constraint reducing the pace of future development occurring.

attractive for many local residents. The less skilled or desirable jobs vacated by individuals transferring to construction work could be filled by other less skilled unemployed residents. Finally, the cumulative labor force demand on eastern Riverside County also could be partly reduced as projects located to the west would be closer to cities and potential workers outside the BSPP's regional study area. Consequently, these projects could meet some of their labor needs from residents from Desert Hot Springs, Morongo Valley, or Banning.

Housing and Lodging Impacts within the Local Study Area

Nonetheless, there could be demand for specialized construction trades that exceed the available labor supply for that specialty within eastern Riverside County. In which case, it is assumed that those job positions would be filled by workers relocating into the region from elsewhere.

Given the numerous factors discussed above, it is difficult to project the extent of future weekly commuting or other in-migration that would be necessary to meet the future cumulative labor needs within the region. However, as a conservative assumption, other social and economic impacts analyses for solar projects have suggested that a 15 percent rate of in-migration would be a conservative and reasonable assumption. Such a proportion of in-migration applied to the projected maximum future cumulative labor force demand would suggest that up to 1,165 construction workers could require temporary housing in the local, or possibly, regional study area.

As discussed earlier, the skilled construction labor force within Riverside County is estimated to be approximately 69,100. This suggests that there is likely to be a considerable additional potential labor force available that could be willing to commute weekly or temporarily relocate to the local area. Consequently, from a broader geographic and labor force perspective, no significant shortages of adequately skilled construction workers, if foreseen, provide adequate and/or suitable housing available for relocating near the projects' sites.

The cumulative influx in construction labor to the area could create demand for temporary housing that is greater than the existing supply of temporary lodging. As discussed in the previous construction impact analysis, private and public RV/campgrounds are not expected to be suitable or attractive lodging options for most project construction workers seeking local accommodations. There are expected to be some suitable and available temporary lodging at local hotel/motel lodging. Although, room availability and prices could be higher during the winter months, based on County-wide vacancy rate estimates, nearly 300 rooms could be available in the local area. Given that some construction workers might be willing to share rooms and save on their lodging costs, the existing local hotel/motels could be able to satisfy up to 450 future construction workers seeking local temporary housing. If construction workers were willing to commute 1.25 to 1.75 hours daily to the site, the supply of potential hotel/motel increases dramatically to an estimated 8,285 rooms, which would correspond to 2,420 rooms. This would be more than sufficient temporary housing for an expected 1,165 construction workers seeking temporary housing.

In addition to the available lodging in the local area, there are also potentially considerable under-utilized homes in the local area that may be suitable for rent by construction workers seeking

local housing. Within the City of Blythe, approximately 880 homes are currently estimated to be vacant and another 1,594 local housing units may be available within the cities of Ehrenburg and Quartzite in Arizona. Given that some construction workers could be willing to share homes to reduce their lodging costs, these housing units could provide more sufficient housing for the projected cumulative local housing demand.

Some of the solar developers might also choose to develop onsite housing facilities for their construction work forces. For example, on-site worker accommodations are planned as part of the Rice Solar project by its developer.[13] The Eagle Crest Pumped Storage project near Desert Center is located at a former mine site that has housing previously used by mine workers. Project documents indicate that the possible use of the onsite housing for the pumped storage project is under consideration.

Irrespective of the availability of temporary housing, it may be expected that, even under future cumulative conditions, a relatively small proportion of construction workers would choose to permanently relocate to the local communities where they are employed during construction. This is because many construction workers could choose to commute relatively long distances to their work sites and may expect to seek work within the more populated areas of Riverside and San Bernardino Counties in the future.

Furthermore, during the same time period with the greatest potential for adverse impacts resulting from the cumulative demand for construction worker housing, there also would be a major positive economic stimulus to the Blythe area and eastern Riverside County economies associated with the solar development which could likely offset any adverse impacts.

In summary, there is potential for short-term adverse cumulative social and economic impacts in the Blythe area associated with the demand for skilled construction labor for the dozen solar projects proposed for future development within eastern Riverside County. Analysis suggests that future construction labor demand would be greatest from 2012 to 2014 and may be sufficient to exceed the existing local work force within eastern Riverside County. In which case, there may be increased demand for temporary local housing from construction workers seeking to commute weekly to the local area. However, given the estimated availability of lodging and possible rental housing, it is expected that there will adequate and suitable housing to meet any future construction worker temporary housing demand. Therefore, no major adverse social or economic impacts would be expected to result.

Operations

If all of the 13 major BLM Solar Projects identified are constructed, a total of 6,108 MW of new solar power would be developed. The average solar power project is estimated to require approximately 0.21 operations workers for each MW of solar power production. Consequently, if full build-out of the planned solar development occurs, the future cumulative operations labor

[13] Development of temporary worker housing facilities is more likely to be possible at projects (such as Rice), which are located on private property.

employment in the region would be approximately 1,280. The BSPP's operations employment of 221 jobs represents approximately a 17.3 percent contribution to the cumulative operations labor need.

As discussed in the earlier operations analysis, there is currently only a limited population of skilled plant workers living in the eastern Riverside County. However, the transferability of construction worker skills, on-the-job and local community college training opportunities, as well as the lower skilled qualification requirements for half the operations job suggest that there would be many local and eastern Riverside County residents who would be able to meet the cumulative operations labor needs.

Even conservatively assuming that up to 25 percent of the future operations labor force could be recruited from non-region residents, there would be an in-migration population of 320 operations workers. There is more than sufficient available local housing to accommodate the housing needs of these workers and their families. Furthermore, the relatively limited number of new residents would not be expected to result in any noticeably change to the local communities' social composition or character. The future operations of the solar projects will also generate significant annual economic benefits in local employment, direct and indirect spending at local businesses as well as positive sales and other tax benefits for the local area. Consequently, the cumulative social and economic effect of the future operations of the solar projects would be minor and beneficial.

Decommissioning

Evaluating the proposed action's cumulative impacts when future facility decommissioning occurs is highly speculative. Ultimate decommissioning is expected to occur in 30 to 40 years' time. It is not possible to project with any confidence the likely future social and economic conditions of the local and regional study area. Similarly, it is very difficult to envision the future cumulative scenario conditions that appropriately represent the context within which the BSPP would dismantle its facilities and site reclamation would occur. Simply stated, any presumptions of the future status for the other solar projects (e.g., continued operation, replacement or decommission) would directly determine the nature of the impact that discontinuation of the proposed action would be expected to have.

In any case, the proposed action is expected to be one of many similar solar projects within the eastern Riverside County region. As such, the proposed action's contribution and influence on the region's social and economic conditions would likely be proportional to: (a) its magnitude relative to the other developments projects in the region; and (b) the collective size and relationship of the combined development projects to the region's social and economic conditions. Consequently, from the current perspective and based on the currently and foreseeable future circumstance for the project and the region, there is no evidence to suggest that future decommissioning of the BSPP would have anything but at most a very minor adverse cumulative impact on the local and regional area's economic or social environment.

Social

Construction

The cumulative impact of the many proposed future solar and non-solar development projects in Eastern Riverside County would result in considerable short-term construction activity at many locations throughout the region. Future cumulative demand for construction workers for these projects could exceed the available supply of skilled construction workers living in the region. In this case, construction workers from elsewhere in Riverside County, Southern California, or Arizona could be attracted to the area by the construction employment opportunities. The potential for adverse social impacts would be decreased if there is a sufficient suitable supply of housing and lodging to satisfy these workers' local housing demand. Therefore, in this case, no new residential or lodging growth would be expected to occur.

The ongoing construction activity in the region, influx of construction workers both commuting daily to the site, and the more limited number who could choose to temporarily live in the local area could noticeably alter the social character and environment within Blythe and the other communities within the local area. A construction worker population of 7,780 would be equivalent to nearly approximately 29 percent of the estimated total local study area population and, consequently, would be cumulatively likely to be very noticeable.

The potential influx of construction workers to the local area would be accompanied by an increase in economic activity from their spending in local business establishments. In addition, the planned new development projects would also make purchases from local businesses for construction materials and supplies, various kinds of services, etc.

The effects of the increased activity on local attitudes and quality of life may vary amongst residents. While some residents may be displeased by increased traffic, new visitors and temporary residents (particularly those employed or otherwise benefiting economically from the construction) could welcome the development.

However, an influx of new workers also could increase the demand for certain kinds of government services and infrastructure (e.g., police and fire services and medical facilities and services). There have been other past instances of rapid growth in rural areas as a result of energy-related development, most notably the energy boom in the 1970s in states such as Wyoming. A number of communities, such as Rock Springs and Gillette, Wyoming, became known as "boomtowns," and the local economic benefits from the new energy development in the region were accompanied by some social changes that were not seen as positive by many existing residents. These included changes such as growth in number of bars, higher crime rates, and perceived (by some) aesthetic degradation due to rapid growth occurring to accommodate the sudden increase in population.

The presence of existing larger communities (such as Indio and Coachella) that are within possible commuting range for construction workers could suggest that circumstances may differ substantially from those facing the more isolated Wyoming boomtown communities 35 years ago.

However, there would remain a potential for temporary impacts in the Blythe area, particularly if the possibility of such social and economic impacts are not unanticipated and are not managed.

Operations

As discussed in the corresponding economic cumulative analysis, the proposed action's future operations would be expected to have a minor and beneficial effect on the local and eastern Riverside County economy. Even conservatively assuming that up to 25percent of the future operations labor force could be recruited from non-region residents, there would be an in-migration population of only 320 operations workers. There is likely to be more than sufficient available local housing to accommodate the housing needs of these workers and their families. Furthermore, the relatively limited number of new residents would not be expected to result in any noticeably change to the local communities' social composition or character. The future operations of the solar projects also would generate significant annual economic benefits in local employment, direct and indirect spending at local businesses as well as positive sales and other tax benefits for the local area. Consequently, the cumulative social and economic effect of the future operations of the solar projects would be minor and beneficial.

Decommissioning

As discussed in the corresponding economic cumulative analysis, there is insufficient information to reliably project the conditions when decommissioning of the proposed facilities would occur in 30 to 40 years in to the future. Consequently it is highly speculative to attempt to characterize the future situation and circumstances under which facility decommissioning would occur.

In any case, the proposed action is expected to be one of many similar solar projects within the eastern Riverside County region. Consequently, from the current perspective and based on the currently and foreseeable future circumstance for the project and the region, there is no evidence to suggest that the future project decommissioning would have anything but at most a very minor adverse cumulative impact on the local and regional area's social environment.

Alternatives

Reconfigured Alternative

The construction spending and employment for the Reconfigured Alternative would be expected to be comparable to those for the proposed action and, consequently, the cumulative impact would be similar.

Reduced Acreage Alternative

The construction spending and employment for the Reduced Acreage Alternative would be expected to be reduced from that for the proposed action and, consequently, the cumulative impact would be similarly reduced in magnitude.

No Action Alternative A

The social and economic impacts associated with the proposed action would likely only be delayed by selecting No Action Alternative A, since this region of the United States has extremely positive characteristics for solar power generation. If this proposal were not approved, another application for a different solar generating facility or a different type of solar generating facility would likely be filed at some time in the future. An application could also be filed for a wind energy facility or any other kind of use and any cumulative impacts would result based on the specific use requested.

No Action Alternative B

The social and economic impacts resulting from the proposed action would not occur under No Action Alternative B since the application would be denied and the plan amended to identify the land as unsuitable for solar energy generation. However, the land would remain open to other types of rights-of-way and/or land use authorizations, resulting in potential cumulative impact specific to a future use other than solar energy generation.

No Action Alternative C

Cumulative impacts associated with the proposed action would likely only be delayed by selecting No Action Alternative C since this region of the United States has extremely positive characteristics for solar power generation. If this Project were not approved, another application for a different solar generating facility would likely be filed at some time in the future.

4.13.4 Summary of Mitigation Measures

No mitigation is required.

4.13.5 Residual Impacts after Mitigation Measures were Implemented

No mitigation measure would be implemented and therefore no residual impacts would remain.

4.13.6 Unavoidable Adverse Impacts

No unavoidable adverse social or economic impacts would be expected to be associated with the proposed action.

4.14 Impacts on Soils Resources

4.14.1 Impact Assessment Methodology

Official Series Descriptions by the National Resources Conservation Service (NRCS), the leading source for soil surveys, were used to detail soil characteristics of an area including depth, texture, drainage, permeability, and erosion hazard of individual soil mapping units. A general survey to characterize the soil conditions was also commissioned by the Applicant and conducted in summer 2009 in conjunction with the Preliminary Geotechnical Investigation. General soils data was also derived from the United States General Soil Map, which is a 4th order survey (5th order being the least detailed – scale of 1:250,000 to 1:1,000,000). This data was used in conjunction with observations and laboratory testing to characterize the soils on the BSPP site.

4.14.2 Discussion of Direct and Indirect Impacts

Proposed Action

Erosion

Erosion is the displacement of solids (soil, mud, rock, and other particles) by wind, water, or ice and by downward or down-slope movement in response to gravity. Due to generally flat terrain, the BSPP site is not prone to significant mass wasting (gravity-driven erosion and non-fluvial sediment transport) at present. Soil characteristics at the BSPP site allow for the potential for wind and water erosion, and significant sediment transport currently occurs along McCoy Wash during periods of infrequent flooding.

Grading of the BSPP site would result in a less than 1 percent slope downward from the west to the east of the site. Earthwork associated with the BSPP would include excavation for foundations and underground systems, and the total earth movement that would occur is approximately 8.3 million cubic yards. The vast majority of the BSPP grading and excavation would occur on the BSPP site, with only minor excavation needed for installation of a gas line within the linear right-of-way.

During construction, the BSPP site and those portions of the BSPP ROW supporting off-site linear facilities (access road, gas pipeline and transmission line corridor) would be disturbed. At that time, the surface of the disturbed areas would be devoid of vegetation and there would be the highest potential for erosion, as well as associated effects including soil loss and increased sediment yields downstream from disturbed areas.

Wind Erosion

The potential for soil loss by wind erosion was estimated using the Wind Erosion Prediction System (WEPS) for pre-development (undisturbed), during construction, and operational conditions. The soils on the BSPP site have a low to very high hazard for wind erosion. The results are presented in the following table.

TABLE 4.14-1
ESTIMATE OF SOIL LOSS BY WIND EROSION USING WIND EROSION PREDICTION SYSTEM (WEPS) MODEL

Soil Type	Predicted Soil Loss (tons per acre per year)		
	Undisturbed Conditions	Disturbed Conditions (Construction)	Operational Conditions
Gunsight Series	88	71	38
Cipriano Series	101	81	49
Aco Series	539	553	296

SOURCE: AECOM, 2009.

The wind erosion values calculated for the site indicate that during construction, only the Aco Series type soils would exceed undisturbed conditions. Large areas of the site consist of desert pavement that has formed from previous removal of fine particles through wind erosion. The resulting desert pavement is resistant to further wind erosion. If this protective layer is disturbed, the underlying layer of aeolian material is subject to high levels of wind erosion, comparable to the Aco Series. The Aco Series on the eastern third of the site has the highest erosion rates for undisturbed, disturbed, and operational conditions.

Water Erosion

The potential for soil loss by water erosion (sheet and rill erosion) was estimated using the Universal Soil Loss Equation (USLE) for pre-development, during construction, and operational conditions; results are included in Table 4.14-2.

TABLE 4.14-2
ESTIMATE OF SOIL LOSS BY WATER EROSION

Soil Type	Predicted Soil Loss (tons per acre per year)		
	Undisturbed Conditions	Disturbed Conditions (Construction)	Operational Conditions
Gunsight Series	0.42	0.92	0.84
Cipriano Series	1.16	4.63	1.46
Aco Series	0.23	0.51	0.23

SOURCE: AECOM, 2009.

Water erosion from sheet and rill erosion under the present undisturbed conditions can be considered negligible except for wash areas in the central portion of the site where soils are potentially more erosive due to higher silt content. High infiltration rates, flat slopes, and low rainfall contribute to the low water erosion rates. Modeling shows soil erosion rates would increase for both construction and operation on all soil series except on the Aco Series during the operations phase, which would revert to its undisturbed erosion rate. Increased rates are due to soil compaction and the resulting increase in bulk density. Compaction of the soil would decrease

soil infiltration rates causing greater runoff, especially during high intensity, short duration rainfall events. Additional information on the impacts of stormflow events on soils, and the BMPs and other mitigation measures to be applied, is presented in Section 4.19, *Water Resources*.

Alternatives

Reconfigured Alternative

Impacts would be essentially the same as the proposed action. The increase in footprint of 150 acres would have a minor effect on the analysis results. Soil erosion at the Reconfigured Alternative site could be impacted as a result of the construction and operation of the Reconfigured BSPP. Impacts related to implementation of mitigation measures to minimize soil erosion from wind and surface water are anticipated to be similar to those associated with the proposed action.

Reconfigured Alternative construction activities would disturb site soils at the site and along the linear facilities route(s). It is at the time of this disturbance that there would be the highest potential for erosion, as well as associated effects including soil loss and increased sediment yields downstream from disturbed areas. It is expected that BMPs would be utilized to minimize the impacts of soil erosion during construction.

Reduced Acreage Alternative

Peak construction impacts would be the same as the proposed action since construction activity levels are estimated to be similar. Long term construction impacts would be less since the construction period would be reduced. Operation impact levels would be reduced since only three of the four proposed units would be built and operated.

No Action Alternative A

Because there would be no amendment to the CDCA Plan and no solar project approved for the site under this alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site. As a result, the impacts to soils from the construction and operation of the proposed action would not occur. However, the land on which the BSPP is proposed would remain available to other uses that are consistent with BLM's land use plan, including another solar project requiring a land use plan amendment. In addition, in the absence of the BSPP, other renewable energy projects may be constructed to meet State and Federal mandates, and those projects would have similar impacts in other locations.

No Action Alternative B

Because the CDCA Plan would be amended to make the area unavailable for future solar development, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site and no soil erosion impacts or impacts to jurisdictional waters. As a result, this No Action Alternative would not result in the

impacts to soils under the proposed BSPP. However, in the absence of the BSPP, other renewable energy projects could be constructed to meet State and Federal mandates, and those projects would have similar impacts in other locations.

No Action Alternative C

Because the CDCA Plan would be amended, it is possible that the site would be developed with the same or a different solar technology. As a result, impacts to soils would result from the construction and operation of the solar technology and resulting ground disturbance and would likely be similar to the impacts to soils and water from the proposed action, including erosion impacts and impacts to jurisdictional waters. Different solar technologies require different amounts of grading; however, it is expected that all solar technologies would require grading and maintenance. As such, this No Action Alternative could result in impacts to soils and water similar to the impacts under the proposed action.

4.14.3 Discussion of Cumulative Impacts

Impacts resulting from construction, operation, maintenance and decommissioning of the BSPP could result in a cumulative effect on soils resources with other past, present, or reasonably foreseeable future actions. The geographic scope of the cumulative effects analysis for soils consists of the Mojave Desert Air Basin, since soils could be transported offsite by wind, and the watershed boundary, since surface flows also could carry eroded soils off-site. Potential cumulative effects on soils resources could occur at any point during the overall lifespan of the BSPP, from pre-construction activities to the conclusion of facility closure and site reclamation.

Existing conditions within the cumulative impacts analysis area reflect a combination of the natural condition and the effects of past actions and are described in this PA/FEIS Chapter 3. Direct and indirect effects of the BSPP are discussed above. In general, construction of the proposed action would result in temporary changes at the site that could incrementally increase local wind-borne soil erosion and storm water runoff during construction. However, the BSPP would be expected to contribute only a small amount to any possible short-term cumulative impacts related to soil erosion, because the Applicant would be required to implement the mitigation measures specified below. Operation of the proposed action would result in permanent changes at the BSPP site. These changes could incrementally increase local soil erosion and storm water runoff. The proposed action would not be expected to cumulatively contribute to these possible long-term operational cumulative impacts because potential BSPP related soil erosion and increased sedimentation resulting from storm water runoff are expected to be reduced to an acceptable level through implementation of the mitigation measures specified below. Nonetheless, these incremental contributions to air- or water-born erosion and sedimentation could combine with the incremental impacts of other past, present and reasonably foreseeable future actions making up the cumulative scenario (see Section 4.1). Construction or maintenance activities, including grading, compaction, drilling, back-filling, driving on unpaved roadways, etc., could disturb soils at any work site, regardless of the type of project and regardless of the phase of its development. However, the combined vegetation removal anticipated as a result of the numerous proposed utility-scale renewable energy projects, including the BSPP, could expose

soils to higher wind-borne erosion rates than the area otherwise would be exposed to. This also could exacerbate runoff rates, especially during high intensity, short duration rainfall events. The Reconfigured Alternative, Reduced Acreage Alternative and No Action Alternatives could be expected to contribute to a cumulative impact on soil resources in proportion to the amount of soil disturbance that could occur pursuant to each.

4.14.4 Summary of Mitigation Measures

The implementation of mitigation measures imposed by the Energy Commission as Conditions of Certification for the BSPP also would avoid or reduce impacts on the quality of the human environment. These mitigation measures are set forth in Appendix G. The following mitigation measures would avoid or minimize impacts on air resources:

> SOIL&WATER-1, SOIL&WATER 10, SOIL&WATER-11, SOIL&WATER-14, SOIL&WATER-15

4.14.5 Residual Impacts after Mitigation Measures were Implemented

Residual soil resource impacts are the increased soil loss from construction and operation as outlined in Tables 4.14-1 and 4.14.-2.

4.14.6 Unavoidable Adverse Impacts

None.

4.15 Impacts on Special Designations

4.15.1 Impact Assessment Methodology

The CDCA Plan serves as a guide for the management of all BLM-administered lands in three desert areas: the Mojave, the Sonoran, and a small portion of the Great Basin. The CDCA Plan covers approximately 25 million acres, of which 12 million are public lands. The primary goal of the CDCA Plan is to provide overall maintenance of the land while planning for multiple uses and balancing the needs of people with the protection of the natural environment.

The NECO Plan is a landscape-scale, multi-agency planning effort that protects and conserves natural resources while simultaneously balancing human uses of the California portion of the Sonoran Desert ecosystem (e.g., the Colorado Desert). The NECO Plan amended the CDCA Plan. The CDCA Plan/NECO Plan is the comprehensive Federal land use and planning document for BLM and other public lands in the project area.

The NECO Plan incorporated 23 wilderness areas (totaling over a million acres) established by the 1994 California Desert Protection Act in the CDCA. Since wilderness areas and ACEC's are the only special designation that could be impacted by the BSPP, this section was prepared using information from the CDCA/NECO Plans.

4.15.2 Discussion of Direct and Indirect Impacts

Proposed Action

The proposed action would have no effects on special designations, since the site is not subject to any such designation, and no new designations or amendments to existing designations are proposed; however, it could affect values in five designated wilderness areas: the Palen/McCoy, Big Maria Mountains, Little Chuckwalla Mountains, Rice Valley and Riverside Mountains wildernesses.

The proposed action would not impact the four ACECs located in the vicinity of the site (i.e., Mule Mountains, Big Marias, Chuckwalla Valley Dune Thicket, and Palen Dry Lake) as these were established to protect cultural and biological resources, and visitor use to these areas is a secondary resource benefit. The Mule Mountain and Chuck Valley Dune Thicket ACECs are located south of the I-10 corridor. Big Marias and Palen Dry Lake are located approximately eight and 14 miles respectively from the BSPP site boundary. Therefore, there would be no effects to wilderness areas or ACEC's from the implementation of the BSPP.

However, indirect short-term or long-term impacts could result from the BSPP to wilderness users' opportunities for solitude, and primitive-unconfined recreation due to construction, operations or decommission activities in any of the surrounding wilderness areas. See also, Section 4.16, *Impacts on Transportation and Public Access - Off Highway Vehicle Resource*, Section 4.18, *Impacts on Visual Resources*, and Section 4.12, *Impacts on Recreation*, which

discusses potential impacts to recreational users, including those using wilderness areas and ACECs from air quality and noise. Therefore, since this is not an indirect impact on special designations, the BSPP would have no impacts.

Alternatives

Reconfigured Alternative

For the same reasons discussed above for the proposed action, no impacts to wilderness areas or ACEC's would occur.

Reduced Acreage Alternative

For the same reasons discussed above for the proposed action, no impacts to wilderness areas or ACEC's would occur.

No Action Alternatives A and B

Under No Action Alternatives A and B, the ROW application would be denied and the ROW grant would not be authorized. Under No Action Alternative A, the CDCA Plan would not be amended; by contrast, under No Action Alternative B, the CDCA Plan would be amended to identify the application area as unsuitable for any type of solar energy development. Regardless of whether the CDCA Plan amendment occurs, neither of these alternatives would result in to special designations for the same reasons as discussed for the proposed action.

Alternative Action C

If No Action Alternative C were selected, the ROW application would be denied, the ROW grant would not be authorized, and the CDCA Plan would be amended to identify the application area as suitable for any type of solar energy development. Like the proposed action, no impacts to wilderness areas or ACEC's would occur.

4.15.3 Discussion of Cumulative Impacts

No direct impacts to designated wilderness areas and ACEC's would occur with implementation of the proposed action and alternatives. Therefore, since there are no direct impacts, no cumulative impacts to special designations would result.

4.15.4 Summary of Mitigation Measures

None required.

4.15.5 Residual Impacts after Mitigation Measures were Implemented

There would be no residual impacts.

4.15.6 Unavoidable Adverse Impacts

None.

4.16 Impacts on Transportation and Public Access – Off Highway Vehicle Resources

4.16.1 Impact Assessment Methodology

Public Access

The CDCA and NECO Plan, which includes a detailed inventory and designation of open routes in the vicinity of the BSPP, were reviewed to determine impacts to open routes.

Transportation

This analysis focuses on potential impacts related to the construction, operation and decommissioning of the BSPP on the surrounding transportation systems and roadways based on the CECs Revised Staff Assessment. For impacts to local transportation systems, the CEC evaluated impacts based on level of service (LOS) determinations, which is a generally accepted measure used by traffic engineers, planners, and decision-makers to describe and quantify the congestion level on a particular roadway or intersection in terms of *speed*, *travel time*, and *delay*.

In addition, the CEC used methodology contained in the *Highway Capacity Manual 2000* to determine potential impacts to intersections from operations of the proposed action. This methodology was used to assess delays at an unsignalized intersection for movements operating under traffic control—a stop sign, for example. For an intersection at which the only stop-sign is placed at a side street, delay would be reported for movements controlled by the stop sign. The delay then would be assigned a corresponding letter grade to represent the overall condition of the intersection or level of service. These grades range from LOS A, free-flow, to LOS F, poor progression.

The assessment of transportation-related impacts is based on evaluations and technical analyses designed to compare the pre-BSPP conditions to the post-BSPP conditions.

4.16.2 Discussion of Direct and Indirect Impacts

Proposed Action

Public Access

OHV Routes

The site has approximately seven miles of designated open routes that would be closed to off-highway vehicle (OHV) use. Designated travel routes and distances within the BSPP site boundary are described in Table 4.16-1, which includes one major route and several small spurs.

The major route, No. 661085, is a north/south link between the Interstate 10 corridor and Arlington Mine Road to the north. This route provides access for both street-legal and non-licensed OHV's

TABLE 4.16-1
DESIGNATED ROUTES WITHIN BLYTHE PROJECT AREA

NECO Designated Route Number	Distance within BSPP site (mi)	Recreational Significance
661085	2.01	High
661113	1.86	Med
660835	0.81	Med
661185	0.54	Unknown
660839	0.43	Unknown
661115	0.98	Med
Total	***6.63***	

that are not permitted to travel on the paved county maintained Midland Road. Elimination of this route would impact the ability of OHV's to travel in this area and would additionally eliminate an important link that forms a looped route around the east and west side of the Palen/McCoy and the Rice Valley Wilderness, respectively. According to the BLM Rangers from the Palm Springs Field Office, OHV use in and around the site is minimal with not more than, conservatively, a few hundred visits in a year during the cool months (September-May). Moreover, there are a number of other alternative routes that provide access to these wilderness areas from the I-10 corridor so overall access for wilderness recreation would not be impacted. In general, sightseeing and day use touring by locals is the predominant use pattern on the affected routes; therefore, removal of approximately 6,000 acres of open space within a natural desert environment could impact OHV users whom would access the site for hiking and camping from designated OHV routes.

Moreover, major route No. 661085 provides access to two private land in-holding areas north of the BSPP site. These land owners would lose their legal access as the entire site boundary is fenced.

The remaining designated routes within the project area have been evaluated in the field by BLM for potential access to historical or recreational features but do not appear to have the significance of route No. 661085.

The first minor road that would be closed exits the north-south road on private property then extends across BLM-administered land to private property that lies immediately west of the southwestern portion of BSPP and terminates at the western boundary of the private land. Although shown on maps as an "open" route, BLM has not secured an easement from the landowner that would allow public access across the private land to the BLM-administered land. Since the BLM has not secured an easement, this road would not need to be relocated, as it does not provide legal access to BLM-administered land. As part of continued plan implementation, BLM could close this road.

The second minor road exist the north-south road further north and heads west approximately one mile before terminating approximately 0.5 mile west of the BSPP site. This road does not provide access to private in-holding and/or any other special designated areas. Accordingly, this road could be closed for as long as the BSPP is operational and restored to open status once the BSPP

is removed and the land reclaimed. This would be within the purview of the BLM's continued plan implementation actions not requiring a plan amendment.

While construction of the proposed transmission line would traverse an open route and result in disruptions to motorized vehicle use along this route, as the transmission line would be strung over the route on existing structures, it would only result in a temporary disruption to the use of that portion of the route. Users of the established route could detour onto the linear ROW and travel the length of the transmission line further disturbing native plants and animals.

Construction and operation of the proposed action would introduce a new industrial feature that could attract OHV operators in the surrounding viewshed to the site boundary via designated OHV open routes or overland. This could increase the opportunities for vandalism, illegal cross-county use and other disruptive behavior.

Washes Open Zones

This project area is located in the Limited Multiple Use Class (MUC L) which allows OHV travel in open washes. The McCoy Wash, a navigable wash, would be transected by the BSPP site, which would result in closure of the wash to OHV users.

Transportation

Construction

Workforce. Construction of the BSPP would be completed over an approximately 69-month period beginning in late 2010. The construction workforce would peak during month 16 at approximately 1,000 workers per day and average approximately 600 workers over the course of construction. Construction of the transmission line is expected to require a limited crew with fewer than 25 workers during peak periods. However, the transmission line construction schedule would not coincide with the peak of plant site construction employment.

The worst-case scenario, where all workers commute in automobiles with only one occupant per vehicle, yields a peak trip generation of approximately 1,000 inbound trips during the morning peak period and another 1,000 outbound trips during the evening peak hour. In the worst-case scenario, one-way worker trips would peak at 2,000 trips per day and an average of 1,200 one-way trips per day. Construction would also generate an average of approximately 15 to 20 one-way, truck trips per day with a peak of approximately 50 to 75 truck trips per day. The peak time for truck travel would occur during the construction of the foundation for the plant site and would not coincide with the peak onsite worker commute timeframe (month 16 in early 2012).

To accommodate the worst-case scenario, a temporary parking area of approximately eight acres would be required for construction personnel parking (assuming 350 square feet per vehicle) with additional area required for the staging and laydown of equipment, materials, and supplies. The project would include onsite laydown and parking areas during construction. Those areas would be relocated around the site as construction progresses. Safety and efficiency concerns require on-site parking and laydown areas. That is, a traffic hazard could occur if workers were to park

on public roadways or if public roadways were used for the staging and laydown of equipment, materials, and supplies. Such a hazard could adversely impact the LOS on I-10 as well as the safety of the workers and drivers.

The construction workforce would be drawn from the surrounding local and regional area, including a small number from the greater Los Angeles Basin. See FEIS Section 4.13. Project construction traffic from the Los Angeles, Palm Springs, and Indio areas is expected to follow I-10 east to the site. Workers traveling from Blythe and the Arizona towns of Quartzsite, Ehrenberg, and Cibola would follow I-10 west to the site.

A large portion of the construction workforce is expected to come from or at least be temporarily housed in the Blythe and Indio areas (including Coachella, Thermal, and Mecca). These workers would also approach the site following I-10 from the west. Drivers approaching from Blythe itself would generally follow I-10 westerly to Mesa Drive where they would exit to the north and follow Blackrock Road west to the site. However, some workers are likely to follow Hobsonway west directly to Blackrock Road.

Traffic from the Brawley/ El Centro area is expected to follow State Route 78 north to I-10 and I-10 west to Mesa Drive. Traffic from the Indio/ Palm Springs area and points west would follow I-10 east to Mesa Drive and the site.

See the following Traffic and Transportation tables for information about traffic volumes for roads and intersections used to access the site:

1. Table 4.16-2, 2010 Peak Hour Roadway Traffic Volumes, Design Capacities, and Levels of Service Without Project
2. Table 4.16-3, 2012 Peak Hour Roadway Traffic Volumes, Design Capacities, and Levels of Service With Project
3. Table 4.16-4, Existing Peak Hour Intersection Levels of Service Without Project
4. Table 4.16-5, 2012 Peak Hour Intersection Levels of Service With Project (With Mitigation)

TABLE 4.16-2
2010 PEAK HOUR ROADWAY TRAFFIC VOLUMES, DESIGN CAPACITIES, AND LEVELS OF SERVICE WITHOUT PROJECT

	Existing Conditions			
Roadway/Segment	**Travel Lanes**	**Volume**	**Capacity**	**LOS**
I-10 West of Project Site	4	3,278	8,000	A
I-10 East of Project Site	4	3,278	8,000	A

NOTES: Baseline information from Caltrans 2009 data. Capacity represents approximate two-way capacity in vehicles per hour.

SOURCE: CEC RSA June 2010 Transportation and Traffic Table 1

TABLE 4.16-3
2012 PEAK HOUR ROADWAY TRAFFIC VOLUMES, DESIGN CAPACITIES, AND LEVELS OF SERVICE WITH PROJECT

Roadway/Segment	2012 Conditions			
	Travel Lanes	Volume	Capacity	LOS
I-10 West of Project Site	4	4,278	8,000	A
I-10 East of Project Site	4	4,178	8,000	A

NOTES: Baseline information from Caltrans 2009 data. Year 2009 traffic volumes expanded to Year 2012 at historical rates from year 2002 to 2007 (4.275 percent per year). Capacity represents approximate two-way capacity in vehicles per hour.

SOURCE: CEC RSA June 2010 Transportation and Traffic Table 2

TABLE 4.16-4
EXISTING PEAK HOUR INTERSECTION LEVELS OF SERVICE WITHOUT PROJECT

Intersection	Existing Conditions			
	AM Peak Hour		PM Peak Hour	
	Delay	LOS	Delay	LOS
I-10 Westbound Ramps/Mesa Drive	1.7	A	2.4	A
I-10 Eastbound Ramps/Mesa Drive	3.2	A	3.7	A
Black Rock Road/Mesa Drive/Hobson Way	2.7	A	3.4	A

NOTES: Existing conditions data from Wilson Engineering, 2009. Year 2009 traffic volumes expanded to Year 2012 at historical rates from years 2002 through 2007 or 4.275 percent per year. Average vehicle delay is in seconds. LOS pertains to intersection as a whole. LOS for intersection as a whole.

SOURCE: CEC RSA June 2010 Transportation and Traffic Table 3

TABLE 4.16-5
2012 PEAK HOUR INTERSECTION LEVELS OF SERVICE WITH PROJECT (With Mitigation)

Intersection	Year 2012 and 500 Workers			
	AM Peak Hour		PM Peak Hour	
	Delay (in seconds)	LOS	Delay (in seconds)	LOS
I-10 Westbound Ramps/Mesa Drive	5	A	1.1	A
I-10 Eastbound Ramps/Mesa Drive	8	A	6.4	A
Black Rock Road/Mesa Drive/Hobson Way	11.3	B	9.1	A

NOTES: Year 2009 traffic volumes expanded to Year 2012 at historical rates from years 2002 through 2007 or 4.275 percent per year. LOS assumes 1,000 person workforce split in two shifts of 500 employees arriving and departing one hour apart. LOS for intersection as a whole.

SOURCE: CEC RSA June 2010 Transportation and Traffic Table 4

As indicated in the Table 4.16-2 and Table 4.16-3, LOS for I-10 east and west of the site would operate at LOS A before and during peak hour construction conditions. As Indicated in Table 4.16-4 and Table 4.16-5, intersections would operate at LOS A with the implementation of Applicant-recommended staggered travel times for construction workers. Staggered travel times are important for these intersections because movement of traffic is controlled by stop signs. As a result, vehicle traffic could easily become backed-up or stacked as drivers exit I-10 to the BSPP site.

In addition, several pieces of equipment that exceed roadway load or size limits would need to be transported to the site via I-10 during construction. This equipment includes the steam turbine generator and main transformers. The equipment would be transported using multi-axle trucks. To transport this equipment, the Applicant must obtain special ministerial permits from Caltrans to move oversized or overweight materials. In addition, the Applicant must ensure proper routes are followed; proper time is scheduled for the delivery; and proper escorts, including advanced warning and trailing vehicles as well as law enforcement control are available, if necessary. These roadways could be damaged due to BSPP-related construction activities.

Parking Capacity. The BSPP would include a temporary parking area of approximately eight acres for construction workers, based on the assumption of 350 square feet per vehicle. The parking area would accompany 1,000 vehicles and would be relocated around the site as construction progresses.

An additional area would be required for staging and laydown of equipment, materials, and supplies. That area would also be relocated around the site as construction progresses.

Since the proposed construction parking area is on-site the construction phase of the project would not result in any parking spill-over to sensitive areas and would not create any adverse impacts.

Operations

As indicated in Table 4.16-6 and Table 4.16-7, surrounding roadways and intersections are projected to operate well-below capacity when BSPP is operational in 2016. Projections have taken into account continued local and regional growth as well as the completion of Palen Solar Power Project located 35 miles west of Blythe. Consequently, the addition of 221 workers arriving at the plant in staggered shifts over a 24-hour period would not alter existing or future roadway operating characteristics (LOS). Since these workers would park on-site, the operational phase of the BSPP would not result in any parking spill-over to sensitive areas and would not create any adverse impacts.

In addition, BSPP operations would require approximately 12 truck trips per day for the delivery of materials and supplies as well as for offsite shipment of wastes.

Truck travel as well as other non-employee site visits would be very small and would typically occur during non-peak periods.

TABLE 4.16-6
2016 PEAK HOUR ROADWAY TRAFFIC VOLUMES, DESIGN CAPACITIES, AND LEVELS OF SERVICE

Roadway Segment	2016 Conditions Plus Project Operations		
	Volume	Capacity	LOS
I-10 West of Project Site	3,899	8.000	A
I-10 East of Project Site	3,960	8.000	A

NOTES: Year 2009 traffic volumes expanded to Year 2016 (project completion) at historical rates from years 2002 to 2007 or 4.275 per year. Capacity is approximately two-way capacity in vehicles per hour. Completion Palen Solar Power Project north of I-10 assumed in calculations.

SOURCE: CEC RSA June 2010 Traffic and Transportation Table 5

TABLE 4.16-7
2016 PEAK HOUR INTERSECTIONS LEVELS OF SERVICE

Intersection	2016 Conditions Plus Project Operations			
	AM Peak Hour		PM Peak Hour	
	Delay	LOS	Delay	LOS
I-10 Westbound Ramps/Mesa Drive	3.5	A	2.2	A
I-10 Eastbound Ramps/Mesa Drive	4.3	A	5.1	A
Black Rock Road/Mesa Drive/Hobson Way	5.4	A	5.6	A

NOTES: Year 2009 traffic volumes expanded to Year 2016 at historical rates from years 2002 through 2007 or 4.275 percent per year Average vehicle delay is in seconds.

SOURCE: CEC RSA June 2010 Traffic and Transportation Table 6

Alternatives

Reconfigured Alternative

Public Access

Impacts to major route, No. 661085, a north/south link between the Interstate 10 corridor and Arlington Mine Road to the north would generally be the same. However, since the modified Unit 3 would be more south than the proposed Unit 3, another spur road, the southernmost spur, which accesses a private in-holding would be closed. Impacts to the other two spur routes would be the same as under the proposed action. Under the Reconfigured Alternative impacts to OHV open routes would increase to approximately 8.5 miles of open routes impacted. Impacts related to construction, operations, maintenance and decommission of this alternative would be similar to the proposed action. Moreover, OHV use access would be restricted to the west side of the Big Maria Wilderness Area and to the northeast side of the Palen/McCoy Wilderness Area by closing approximately 8.5 mile of OHV routes.

Transportation

Since implementation of the Reconfigured Alternative does not significantly affect the number of workers needed for construction and operation, impacts would be similar to the proposed action.

Reduced Acreage Alternative

Public Access

Impacts to major route, No. 661085, a north/south link between the Interstate 10 corridor and Arlington Mine Road to the north would generally be the same as the proposed action. Impacts to the two spur roads would not occur. Under the Reduced Acreage Alternative, impacts to OHV open routes would decrease to approximately one mile of open routes impacted. There would be no direct impacts to McCoy wash; however, access would still be restricted during the life of the Reduced Acreage Alternative. Impacts related to construction, operation and maintenance, and closure and decommissioning of this alternative would be similar to the proposed action. Moreover, OHV use access would be restricted to the west side of the Big Maria Wilderness Area and to the northeast side of the Palen/McCoy Wilderness Area by closing approximately one mile of OHV routes.

Transportation

Since implementation of the Reconfigured Alternative does not significantly affect the number of workers needed for construction and operation, impacts would be similar to the proposed action.

No Action Alternatives A and B

Public Access

Generally, for the two no action Alternatives A and B, there would be no direct or indirect impacts to OHV routes and values.

Transportation

If No Action Alternative A or B were selected, none of the anticipated transportation-related impacts of the proposed action would occur. Instead, the land on which the BSPP is proposed would become available to other uses consistent with CDCA Plan use opportunities, potentially including another renewable energy project. Thus, impacts of this alternative on transportation could be substantially similar to the proposed action.

No Action Alternative Action C

Public Access

For the No Action Alternative C, where the ROW for the proposed action would not be granted but the CDCA would be amended to find the proposed action area suitable for any type of solar energy development, impacts to OHV open route and associated affects could be similar to the proposed action; however, dependent on the technology and site layout, impacts to OHV designated routes could be avoided or minimized.

Transportation

For the No Action Alternative C, where the ROW for the proposed action would not be granted but the CDCA Plan would be amended to find the proposed action area suitable for any type of solar energy development, impacts to transportation could be similar to the proposed action.

4.16.3 Discussion of Cumulative Impacts

Public Access

In addition to the proposed BSPP, there are many past, present, or reasonably foreseeable future actions that contribute to impacts on OHV use. During the CDCA and NECO planning process, a detailed inventory and designation of routes was developed. This route designation system, along with other land management actions such as setting aside areas of critical environmental concern (ACECs) and the congressional designation of wilderness areas, has resulted in a significant loss of OHV recreation opportunities in the eastern Riverside County. Currently, there are no BLM-designated “open” OHV areas in Riverside County. This decrease in “open” OHV areas in Riverside County through the NECO planning process likely improved the recreational experience for some users who preferred remote camping and hiking and decreased the recreational experience for some users who prefer open OHV use areas rather than designated routes. Numerous energy-related development projects, including the proposed action, would result in the closure of OHV open routes and would have an adverse effect on the viewscape that would result in some users seeking out, legally or illegally, other areas of the desert for their activities and experiences. Therefore, the combined effect of the overall cumulative past, present, and proposed and reasonably foreseeable projects in eastern Riverside County would adversely affect OHV open route through closures, rerouting, and use restrictions.

Transportation

Construction

As depicted in Figure 9, a number of solar projects are projected to be built within approximately 100 miles of the I-10 corridor (Desert Center to Blythe). The Palen, Genesis and Desert Sunlight projects currently are proposed to be constructed on BLM land and currently are under review by BLM. These projects, as well as other projects in the vicinity of the BSPP, could affect the I-10 corridor between Desert Center and Blythe due to construction traffic.

Construction of the BSPP is scheduled to overlap with the construction schedules of three other projects in the area, two solar energy generation parabolic trough projects, the Palen Solar Power Project and Genesis Solar Energy Project as well as the Desert Sunlight Photovoltaic Project. These three projects plus the BSPP would result in approximately 3,566 workers travelling on I-10 to their work sites at the same time. The overlapping construction schedules of these projects would result in cumulatively considerable impacts to I-10 as well as to local streets, highways, and intersections in the vicinity of the BSPP site.

Operations

Truck travel as well as other non-employee site visits would be very small and typically would occur during non-peak periods. Consequently, cumulative operational impacts would not be significant and would not require mitigation.

4.16.4 Summary of Mitigation Measures

Public Access

BLM-OHV-1: No less than 60 days prior to construction, the Applicant shall coordinate with the authorized officer administering any NECO Plan-designated open routes to establish temporary closure of the routes to avoid construction area hazards, if the route is deemed unsafe to use during construction. The Applicant shall post a public notice of the temporary route closure and penalties for any off route OHV activities. The Applicant shall document its coordination efforts with the authorized officer and submit this documentation to the BLM and other agencies affected at least 30 days prior to construction.

BLM-OHV-2: The BLM may require the Applicant, in consultation with the BLM, to reestablish north/south OHV connectivity to the west side of the Big Maria Wilderness Area and to the northeast side of the Palen/McCoy Wilderness Area[1].

Transportation

The mitigation measures imposed by the Energy Commission as Conditions of Certification for the BSPP would avoid or reduce impacts on the quality of the human environment. These mitigation measures are set forth in Appendix G. The following mitigation measures would avoid or minimize impacts on Transportation:

TRANS-1,[2] TRANS-2, TRANS-3, TRANS-4, TRANS-5

Implementation of TRANS-2 also would mitigate construction-based cumulative impacts.

4.16.5 Residual Impacts after Mitigation Measures were Implemented

Public Access

OHV users would be displaced and could illegally substitute other natural, undisturbed desert areas for their riding experiences and benefits causing impacts to sensitive desert resources including biological and/or cultural resources.

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1 Implementation of a new route would required additional NEPA analysis as well as biological and cultural resources surveys to the extent an agreed upon route had not been surveyed during this PA/FEIS process.

2 Energy Commission staff note that with the implementation of TRANS-1, parking arrangements may be modified. The BLM concurs with this.

Transportation

LOS within the vicinity of the BSPP would be at LOS C, greater than existing LOS A.

4.16.6 Unavoidable Adverse Impacts

Public Access

Reflected sun from the solar troughs would produce glint and glare that could distract OHV users in the surrounding areas.

The McCoy Wash, a navigable wash, would be transected by the BSPP site which would result in closure of the wash to OHV users.

Transportation

There would be no unavoidable adverse impacts related to transportation.

4.17 Impacts on Vegetation Resources

4.17.1 Impact Assessment Methodology

This analysis is based, in part, upon information from the following sources: the Application for Certification (AFC) (Solar Millennium 2009a) and Supplement to the AFC (Solar Millennium 2009b); responses to staff data requests (AECOM 2010a); CEC staff workshops held on December 9 and 18, 2009, January 7, 10, 14 and 25, 2010, and April 28, 2010; site visits by CEC staff on October 7, 2009, November 3, 2009 and January 25, 2010; communications with representatives from the California Department of Fish and Game (CDFG), the Bureau of Land Management (BLM), and the U.S. Fish and Wildlife Service (USFWS); and information contained within the Northern and Eastern Colorado Desert Coordinated Management Plan (NECO). Additionally, new information was obtained between the SA/DEIS publication and development of the PA/FEIS. This information primarily relates to surveys for special status plants (AECOM 2010w) and does not change any of the conclusions made in the SA/DEIS. The BLM was integrally involved in the preparation of this analysis with the CEC and other natural resource agencies.

This section analyzes potential impacts to vegetation resources from the construction and operation of the BSPP. This analysis addresses potential impacts of the BSPP (including ancillary facilities) to special-status plant species, sensitive natural communities and other significant vegetation resources. Direct, indirect, and cumulative impacts are analyzed and quantified, if possible.

Direct impacts are those resulting from the BSPP and occur at the same time and place. Indirect impacts are caused by the BSPP, but can occur later in time or farther removed in distance while still reasonably foreseeable and related to the proposed action. The potential impacts discussed in this analysis are those most likely to be associated with construction and operation of the BSPP.

Impact analyses typically characterize effects to plant communities as temporary or permanent, with a permanent impact referring to areas that are paved or otherwise precluded from restoration to a pre-project state. In the desert ecosystems the definition of permanent impacts needs to reflect the slow recovery rates of its plant communities. Natural recovery rates from disturbance in these systems depend on the nature and severity of the impact. For example, creosote bushes can resprout a full canopy within five years after damage from heavy vehicle traffic (Gibson et al. 2004), but more severe damage involving vegetation removal and soil disturbance can take from 50 to 300 years for partial recovery; complete ecosystem recovery may require over 3,000 years (Lovich and Bainbridge 1999). In this analysis, an impact is considered temporary only if there is evidence to indicate that pre-disturbance levels of biomass, cover, density, community structure, and soil characteristics could be achieved within five years.

4.17.2 Discussion of Direct and Indirect Impacts

Proposed Action

Stabilized and Partially Stabilized Dunes and Sand Transport Corridor

The western portion of the gen-tie route are exclusively within stabilized and partially stabilized dune habitat as well as the major regional sand transport corridor. Construction of the gen-tie would directly impact sand dunes. Construction of the gen-tie would have little direct impact on the sand transport corridor. Indirect impacts include facilitating the spread of noxious weeds, including Sahara mustard. Sahara mustard increases stabilization, and therefore degrades, dune habitat.

Sonoran Creosote Bush Scrub

Direct impacts to creosote bush scrub include the permanent loss of, and fragmentation of, adjacent wildlife habitat and native plant communities. Other temporary and permanent indirect impacts from the proposed action could occur to surrounding vegetation communities from grading activities disturbing soils and creating air-born, fugitive dust, sedimentation, and erosion, which disruption of photosynthesis and other metabolic processes. The destruction of plants and soil crusts by windblown sand and dust also exacerbates the erosion of the soil and accelerates the loss of nutrients (Okin et al. 2001).

Ephemeral Drainages & Sensitive Plant Communities

Direct impacts include permanent loss of hydrological, geomorphic, and biological functions and values of desert dry wash woodland, vegetated ephemeral steams and unvegetated ephemeral dry wash. Indirect Impacts include loss of hydrological connectivity downstream of the BSPP, including desert dry wash woodland, vegetated ephemeral steams and unvegetated ephemeral dry wash. Other indirect impacts include head-cutting on drainages upslope and erosion/sedimentation downslope. The BSPP would alter the hydrology of the area by re-routing these waterways through five engineered channels thereby altering washes downstream of the BSPP.

Special-Status Plants

Direct Impacts

No Federal or State-listed plant species occur within the BSPP Study Area so none would be impacted. Permanent direct impacts to six of the seven non-listed special status species documented within the Study Area would occur as a result of construction activities. These special status plant species are expected to be permanently and directly impacted through removal during Project construction. Additionally, a large number of Harwood’s milkvetch, ribbed cryptantha and Harwood’s woollystar occurrences within the BSPP are associated with the transmission line. Direct impacts to special status plants include possible additional loss of plants from construction of perimeter channel and bank stabilization on drainages upslope; accidental impacts to plants adjacent to construction, loss of plants in BSPP footprints through blading or crushing, linear facilities routes, along Black Rock Road; and potential accidental direct impacts during construction and operation.

Indirect Impacts

The anticipated indirect impacts to special-status plants, i.e., impacts outside the BSPP Disturbance Area or that occur following construction include: introduction and spread of invasive plants; alteration of the surface hydrology and basic geomorphic processes that support rare plants and their habitat (e.g., disrupted aeolian and fluvial sand transport processes from obstructions and diversions); population fragmentation and disruption of gene flow; potential impacts to pollinators; increased risk of fire; erosion and sedimentation of disturbed soils, which render the habitat vulnerable to invasion by pest plants, disturbance of the structure and ecological functioning of biological soil crusts, which affect seed germination, reduce soil nutrition, carbon sequestration, and render the soil vulnerable to water and wind erosion (Belnap & Eldridge 2001), herbicide and other chemical drift; and disruption of photosynthesis and other metabolic processes from fugitive dust during construction and operation of the BSPP.

The impacts of stressors (such as the spread of invasive plants, hydrologic and geomorphic alterations, etc.) on special-status plants are well-documented in the literature. The benefits of restoration and enhancement to rare plant populations have been demonstrated in a variety of projects conducted by public and private land managers, including BLM, National Park Service, The Nature Conservancy, US Forest Service, California State Parks, and the California Native Plant Society.

Introduction and spread of invasive plants; erosion and sedimentation of disturbed soils; potential disruption of sand transport systems that maintain habitat below the BSPP; alteration of drainage patterns; herbicide drift; disruption of photosynthesis and other metabolic processes from dust. Head-cutting (erosion) of channels upslope containing additional plants; population fragmentation, impacts to pollinators and gene flow; risk of fire are additional indirect impacts.

Cacti, Yucca, and Native Trees

Several species of non-listed cactus and native desert trees observed within the Study Area including California barrel cactus (*Ferocactus cylindraceus var. cylindraceus*), cottontop cactus (*Echinocactus polycephalus var. polycephalus*), common fishhook cactus (*Mammillaria tetrancistra*), beavertail cactus (*Opuntia basilaris*), silver cholla (*Cylindropuntia echinocarpa*), pencil cholla (*Cylindropuntia ramosissima*), catclaw acacia (*Acacia gregii*), blue palo verde (*Cercidium floridium ssp. floridium*), ironwood (*Olneya tesota*), mesquite (*Prosopis glandulosa*), smoketree (*Psorothamnus spinosum*), and ocotillo (*Fouquieria splendens ssp. splendens*) (Solar Millennium 2009a, Volume II, Biological Technical Report) would be impacted directly or indirectly. Cottontop cactus was also mapped and documented during the spring 2010 surveys. A total of six cottontop cactus were documented in the BSPP Disturbance Area during the 2010 surveys; an additional 10 plants were found in the one-mile buffer area.

Invasive Non-Native Plants

Following construction, exotic plant species are characteristically opportunistic and could occupy disturbed soils within the BSPP Disturbance Area and spread into adjacent vegetation communities. Years of high abundance of the noxious weed Sahara mustard have shown a clear

negative impact on native flora (Barrows et al. 2009). Sahara mustard can form dense stands and potentially crowd out native annual plants. Sahara mustard plants growing early in the season may dominate available soil moisture which may adversely affect native annuals which start growing a little later in the season (Barrows et al. 2009). Barrows et al. (2009) found that native annuals growing under a canopy of Sahara mustard were often taller, and were etiolated, at the expense producing branches, flowers, and fruits. This led to a shift in the dominance of the following year's species composition from native annuals to Sahara mustard. Removal of Sahara mustard from active sand dunes had a positive impact on the endangered special-status plant Coachella Valley milk-vetch (*Astragalus lentiginosus var. coachellae*). Coachella Valley milk-vetch plants located on weeded study plots produced significantly more seed pods per plant than the control plots (Barrows et al. 2009).

Tamarisk, Russian thistle, Sahara mustard, Mediterranean grass, and red brome are already present in the BSPP area and would be expected to increase as a result of construction- and operation-related disturbance. The proliferation of these and other non-native species has dramatically increased the fuel load and frequency of fire in many desert ecosystems (Lovich & Bainbridge 1999). Unlike other ecosystems in California, fire was not an important part of the Mojave Desert ecosystems and most perennials are poorly adapted to even low-intensity fires, and the animals that coevolved are not likely to respond favorably to fire either. The potential spread or proliferation of non-native annual grasses, combined with the proximity to ignition sources could potentially increase the risk of fire, and the effects to these poor-adapted desert communities would be harmful, particularly to cacti and most native shrubs species. Burned creosote and other native shrubs are typically replaced by short-lived perennials and non-native grasses (Brown & Minnich 1986). The spread of invasive plants is a major threat to biological resources in the Colorado Desert because non-native plants can displace native plants, increase the threat of wildfire, and supplant wildlife foods that are important to herbivorous species.

Alternatives

Table 4.17-1 shows differences between alternatives for direct and indirect impacts, if quantified. For the No Action Alternatives, no impacts would be anticipated to Vegetation Communities and Special Status Plants in the short term though impacts similar to those discussed for the Proposed Action, Reconfigured Alternative, or Reduced Acreage could occur in the long term for No Action Alternative A and No Action Alternative C. Types of impacts are identical between the Proposed Action, Reconfigured Alternative, and Reduced Acreage Alternative quantities of impacts vary.

Table 4.17-2 compares the compensatory mitigation requirements for the three vegetation communities comprising ephemeral drainages associated with the Proposed Action, Reconfigured Alternative, and Reduced Acreage Alternative.

TABLE 4.17-1
COMPARISON OF DIRECT AND INDIRECT IMPACTS TO VEGETATION COMMUNITIES AND SPECIAL STATUS PLANTS FROM PROPOSED ACTION, RECONFIGURED ALTERNATIVE, REDUCED ACREAGE, AND NO ACTION ALTERNATIVES[a]

Vegetation Community	Proposed Action[b] (acres)	Reconfigured Alternative (acres)	Reduced Acreage Alternative (acres)	No Action A, B, C (acres)
Desert dry wash woodland	212.9 (137.5 indirect)	171.3 (71.2 indirect)	31	0
Unvegetated, ephemeral dry wash	8.7 (0.33 indirect)	5.0 (0.6 indirect)	3	0
Vegetated ephemeral swale (big galleta grass association)	370.8 (44.6 indirect)	237.0 (40.1 indirect)	211	0
Subtotal Ephemeral Drainages	***592.4***	***413.3***	***245***	***0***
Stabilized and partially Stabilized Dunes	58.2	37	37	0
Sonoran creosote bush scrub (including disturbed)	6,364.6	5,134.7	3,920	0
Disturbed habitat	0	0	0	0
Agriculture (including fallow and/or active)	4.4	0	0	0
Developed	4.9	0	0	0
TOTAL	**7,024.5**	**5,585**	**4,202**	**0**

Special Status Plants	Proposed Action[b] (quantity)	Reconfigured Alternative (quantity)	Reduced Acreage Alternative (quantity)	No Action A, B, C (quantity)
Species Combined	7,024.5 acres	25%fewer acres than Proposed Action	25% fewer acres than Reconfigured Alternative	100% fewer acres
CNPS List 1B and CNPS List 2 Plant Species				
Harwood's Milk-vetch	74 occurrences, 637 individuals	69 occurrences, 290 individuals	Unquantified	0 occurrences, 0 individuals
Las Animas Colubrina	15 occurrences, 55 individuals	12 occurrences, 49 individuals	Unquantified	0 occurrences, 0 individuals
Harwood's Woollystar (Eriastrum)	3 occurrences, 13 individuals	0 occurrences, 0 individuals	Unquantified	0 occurrences, 0 individuals
CNPS List 4 Plant Species				
Ribbed cryptantha	10 occurrences, 1.5 x10^6 individuals, 58.17 acres	Same as Proposed Action	Same as Proposed Action	0 occurrences, 0 individuals
Winged cryptantha	0 occurrences, 0 individuals	0 occurrences, 0 individuals	Unquantified	0 occurrences, 0 individuals
Utah milkvine	192 occurrences, 621 individuals	188 occurrences, 677 individuals	Unquantified	0 occurrences, 0 individuals
Desert uniicorn	8 occurrences, 9 individuals	11 occurrences, 21 individuals	Unquantified	0 occurrences, 0 individuals

NOTES:
[a] Acreages for the Proposed Project Disturbance Area (AECOM 2010q, AECOM 2010w) have been rounded. Acreages are approximate for the alternatives (see Section 3.0, Methods and Limitations in this report). It is assumed herein, that all of the vegetation for the alternatives would be impacted.
[b] Does not include direct impacts from the gen-tie and substation sites.

TABLE 4.17-2
COMPARISON OF COMPENSATORY MITIGATION REQUIREMENTS FOR THE PROPOSED ACTION, RECONFIGURED ALTERNATIVE, AND REDUCED ACREAGE ALTERNATIVE[a]

Vegetation Community	Mitigation Ratio	Proposed Action (acres)	Reconfigured Alternative (acres)	Reduced Acreage Alternative (acres)
Desert dry wash woodland	3:1	525	555	93
Unvegetated, ephemeral dry wash	1:1	8	4	3
Vegetated ephemeral swale (big galleta grass association)	1.5:1	550	360	317
Total ephemeral drainage compensatory mitigation Mitigation Measure BIO-22		**1083**	**919**	**413**

NOTE:
[a] Does not include impact acreage from construction of transmission line and substation.

4.17.3 Discussion of Cumulative Impacts

Cumulative impacts are analyzed in detail in Appendix H. Cumulative impacts would vary by alternative only to the degree to which direct and indirect impacts would vary by alternative.

Natural Communities

The geographic scope of the analysis of cumulative effects on plant communities and general wildlife habitat encompasses the NECO planning area and uses the NECO plant communities dataset to map and quantify cumulative effects on foraging habitat. The NECO plant communities dataset is based on the 1996 California Gap Analysis Project conducted by the Biogeography Lab at the University of California, Santa Barbara and coordinated through the USGS Biological Resources Division.

Table 4.17-3 quantifies the cumulative effects to plant communities, stratified by community type. Mojave creosote scrub refers to the creosote bush-dominant desert scrubs that occur within the Mojave Desert region of the California Desert geographic subdivision (Hickman 1993). The transition to Sonoran Desert is mapped at the Bristol Mountains near the Twenty-Nine Palms Marine Corps Base and extends east and south through the NECO planning area.

Special-Status Plants

Las Animas Colubrina

The GIS-based analysis of cumulative effects to Las Animas colubrina habitat (see Appendix H and Figure 21) used the NECO landforms dataset (BLM CDD 2002). The GIS summary of cumulative effects is misleading in this case because the 57 plants that would be destroyed by the BSPP occur just outside of the mapped range depicted in the NECO dataset. However, Las Animas colubrina in general occurs largely in steeper drainages in the mountains and

TABLE 4.17-3
CUMULATIVE IMPACTS: NATURAL COMMUNITIES

Plant Community[a]	Total Plant Communities[a] in NECO	Impacts to Habitat from Existing[b] Projects (Percent of all Community type in NECO)	Impacts to Habitat from Foreseeable Future[c] Projects (Percent of all Community type in NECO)	Contribution of BSPP to future cumulative impacts (Percent of total impacts from Future projects)
Mojave Creosote Scrub	805,832 acres	157 acres 0.02%	43,320 acres 5.4%	0 acres
Sonoran Creosote Scrub	3,829,999acres	11,871 acres 0.3%	226,954 acres 5.9%	5,850 acres 2.6%
Desert Dry Wash Woodland	682,027	2,971 acres 0.4%	47,585 acres 7.0%	101 acres 0.2%
Playa/Dry Lake	88,110 acres	11 acres 0.01%	18,634 acres 21.1%	0 acres
Sand Dunes+	62,140 acres	14 acres 0.02%	56 acres 0.09%	0 acres
Chenopod Scrub	2,113 acres	10 acres 0.1%	0 acres	0 acres
Agriculture, Developed	94,187 acres	4,856 acres 5.2%	1,017 acres 1.1%l	0 acres
Pinyon-Juniper Woodland	1,928 acres	0 acres	0 acres	0 acres

NOTES:

[a] Based on the BLM NECO Plant Communities dataset (BLM CDD 2002) conducted by the Biogeography Lab at the University of California, Santa Barbara and coordinated through the USGS Biological Resources Division UC Santa Barbara GAP Analysis (1996), updated during the NECO planning effort (see Appendix H of the NECO (BLM and CDD 2002)

[b] Includes only those existing projects between Desert Center and the Colorado River for which GIS-based spatial data was available at the time of the analysis

[c] Includes only BLM Renewables that had submitted a Plan of Development (POD) at the time of the analysis and those additional future projects.

+ Does not include impacts from the gen-tie.

foothills, which are less subject to direct and indirect cumulative effects of future renewable energy projects. Cumulatively considerable effects not reflected in the quantitative analysis include: spread of noxious weeds, which also fuel wildfires; and an increase in the potential for fire from transmission lines and increased vehicle use.

Although a larger portion of the population of Las Animas colubrina would be avoided just upstream of the BSPP boundary (117 plants avoided), the BSPP nevertheless would contribute incrementally to cumulative effects on Las Animas colubrina and its habitat. This incremental effect may be greater given the highly restricted range of this species in California, and its position near the periphery of its global range.

Harwood's Milk-vetch and Harwood's Woollystar

Approximately 677 Harwood's milk-vetch were found in the study area, including in the solar fields, the linear facilities route, and along the Black Rock Road. Many of the occurrences on the linear facilities route could be avoided, though direct impacts include potential accidental impacts

to plants identified for avoidance. Indirect impacts include: the introduction and spread of invasive plants; erosion and sedimentation of disturbed soils; potential disruption of fluvial and aeolian sand transport systems that maintain habitat; alteration of drainage patterns; herbicide drift; and disruption of photosynthesis and other metabolic processes from dust.

Approximately 2,134 Harwood's Woollystar were found in the Study Area; approximately 35 occurrences (with varying numbers of plants at each occurrence) were mapped along the gen-tie route, some of which could be avoided. However, the indirect effects of construction of the Colorado substation would cause the loss of many plants and 33 acres of dune habitat. Harwood's Woollystar is documented from less than 20 occurrences, and much of its habitat is also at risk. The cumulative impacts would be considerable, particularly when combined with the effects of introduction and spread of invasive plants; potential disruption of aeolian and fluvial sand transport systems that maintain its habitat; alteration of drainage patterns, and; herbicide drift from this and other reasonably foreseeable future actions.

Many new occurrences of Harwood's milk-vetch have been found in the I-10 corridor (Chuckwalla Valley and Palo Verde Mesa) during the surveys for renewable energy projects. Populations of Harwood's milk-vetch, like many other rare plants of the eastern California deserts, were considered relatively stable until recently, as the push for renewable energy development has placed many at risk. Although the numbers appear robust in the vicinity of the BSPP in spring 2010 (a wetter-than-normal season), there also would be impacts to these occurrences including the direct effects of habitat loss and potentially more effects from disrupted geomorphic processes that maintain habitat, i.e., disruptions of the wind-sand transport corridor and interruptions to sediment transport along the many small washes that contribute important fresh sands to the habitat. In addition, the inevitable spread of Sahara mustard along roads from the increased vehicle use prematurely would stabilize the dunes and disrupt the dune-building processes.

The BSPP impacts to Harwood's milk-vetch and to Harwood's Woollystar, and to the dunes, sand sheets, and sandy washes on which these two special-status plants depend, would be cumulatively considerable. Although the BSPP's contribution to cumulative effects for Harwood's milk-vetch and to Harwood's Woollystar would be reduced, it is possible that the residual indirect effects of all proposed future actions, even after mitigation, could combine to cause a cumulative effect. The combined effects to the sandy habitat from all other future projects (10.8 percent of all habitat in the NECO) would be considerable.

4.17.4 Summary of Mitigation Measures

The mitigation measures imposed by the Energy Commission as Conditions of Certification for the BSPP would avoid or reduce impacts on the quality of the human environment. These mitigation measures are set forth in Appendix G. The following mitigation measures would avoid or minimize impacts on vegetation resources[1]:

[1] The CEC document intertwined vegetation and wildlife resources in the mitigation measures and these have not be modified because as a whole they mitigation the impacts to vegetation and wildlife resources.

BIO-1, BIO-2, BIO-3, BIO-4, BIO-5, BIO-6, BIO-7, BIO-8, BIO-14, BIO-19, BIO-22, BIO-23, BIO-28

Moreover, to address potential impact to Climate Change, the BLM would require, in concert with BIO-7, the following:

BLM BIO-7a: The Applicant shall ensure that monitoring accomplished under BIO-7 and other mitigating measures use available climatalogical data when analyzing project effects or resource trends.

4.17.5 Residual Impacts after Mitigation Measures were Implemented

The BSPP would have major impacts to vegetation resources, eliminating all of the Sonoran creosote bush scrub and other native plant and wildlife communities within the disturbance area of each alternative. The BSPP would also directly and indirectly affect an extensive network of desert washes comprising approximately 250-600 acres of ephemeral drainages, and would alter the hydrology of the area by re-routing these waterways through five engineered channels. The Proposed Action, Reconfigured Alternative, and Reduced Acreage Alternative would all impact the vegetation resources on the more biologically diverse west side of the Study Area. Mitigating measures to avoid, minimize, or compensate for the loss would offset the many of the impacts to varying, but unquantified degrees, though net losses in vegetation resources would occur.

4.17.6 Unavoidable Adverse Impacts

Under the technology proposed in the three alternatives, the Proposed Action, Reconfigured Alternative, and Reduced Acreage Alternative, natural vegetation communities and individuals and local populations of special status plants not otherwise avoided under proposed mitigating measures would be lost from the BSPP sites, totaling 7,025 acres, 5,548 acres, and 4,165 acres, respectively. Despite mitigating measures, the chance of invasion and spread of weeds and the chance of human-caused wildfires would persist to the areas surrounding the BSPP, threatening the surrounding vegetation and special status plant species.

4.18 Impacts on Visual Resources

This section discusses effects on visual resources that would occur with implementation of the proposed action and alternatives, cumulative effects, and mitigation measures to avoid or reduce visual effects. Overall, the BSPP would result in long-term visual alteration to approximately 7025 acres of land, nearly all of which has been classified as B-Quality[1] scenery. One exception is approximately five miles of offsite linear facilities, south of I-10, which would be within land classified as C-Quality scenery. The land altered by the BSPP solar units is considered to have a moderate visual sensitivity whereas offsite linear facilities would occur on land classified as having a high visual sensitivity.

4.18.1 Impact Assessment Methodology

There are two levels of analysis associated with the proposed action. The first is the disclosure of potential effects associated with the designation of the Interim VRM Classification. This is a general analysis and discussion based on the range of land uses allowed within the CDCA.

The second tier of analysis is with respect to the proposed action. Visual resource effects are created when the physical characteristics of facilities associated with proposed actions contrast with natural characteristics of the landscape setting. Contrast is measured by a systematic evaluation of the basic design elements of form, line, color, texture and scale, in accordance with the BLM's Handbook H-8431-1 Visual Resource Contrast Rating. If the contrast rating reveals nonconformance of the proposed action with Interim VRM Class objectives, and mitigation measures are insufficient to bring the project into compliance, then the design would need to be mitigated to the greatest extent possible, and to the VRM Class objective at a minimum. If the project cannot be mitigated to meet the VRM Class objectives, then the project application may not be approved, or may be redesigned or relocated to meet the objective.

The BSPP is evaluated for conformance with the following MUC and VRM objectives:

1. *Multiple-Use Class L* (Limited Use) protects sensitive, natural, scenic, ecological, and cultural resource values. Public lands designated as Class L are managed to provide for generally lower-intensity, carefully controlled multiple use of resources, while ensuring that sensitive values are not significantly diminished.

2. *VRM Class III*: The objective of this class is to ***partially retain*** the existing character of the landscape. The level of change to characteristic landscape should be ***moderate***. Management activities may attract attention but ***should not dominate the view of the casual observer***. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape."

3. *VRM Class II*: The objective of this class is to ***retain*** the existing character of the landscape. The level of change to characteristic landscape should be ***low***. Management activities may be seen, but ***must not attract the attention of the casual observer***. Any

[1] Scenic quality is rated in three categories from A (most scenic) to C (least scenic). See Section 3.20 for a discussion of scenic quality ratings.

> change must repeat the basic elements of form, line color and texture found in the predominant natural features of the characteristic landscape."

However, since the overall VRM goal is to minimize visual impacts, mitigating measures must be prepared for all adverse contrasts that could be reduced, even if the proposed action meets VRM objectives. Further, in addition to permanent visual contrast created in the landscape, the BSPP is analyzed for adverse effects due to lighting and glare, as well as temporary construction disturbances.

4.18.1.1 Visual Contrast Rating Process

The degree to which the BSPP adversely affects the visual quality of a landscape is directly related to the amount of visual contrast between it and the existing landscape character. The degree of contrast is measured by separating the landscape into major features (land/water, vegetation, structures) then assessing the contrast introduced by the project in terms of the basic design elements of form,[2] line,[3] color, and texture. The contrast of the BSPP with landscape elements is then rated as none, weak, moderate or strong, as defined in Table 4.18-1. The purpose of this method is to reveal elements and features that cause the greatest visual impact, and to guide efforts to reduce the visual impact of a proposed action or activity. This process is described in detail in Handbook H-8431-1, Visual Resource Contrast Rating, and documented using BLM Form 8400-4 (see Appendix F).

TABLE 4.18-1
VISUAL CONTRAST RATINGS

Degree of Contrast	Criteria
None	The element contrast is not visible or perceived.
Weak	The element contrast can be seen but does not attract attention.
Moderate	The element contrast begins to attract attention and begins to dominate the characteristic landscape.
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape.

SOURCE: BLM Manual 8431

The criteria for visual contrast are aligned with the management objectives for each Interim VRM Class. For example, if a project results in a weak visual contrast, it is likely to be in conformance with Interim VRM Class II, whereas a project that results in a moderate contrast would likely be in conformance with VRM Class III objectives but would not conform to VRM Class II objectives.

[2] Contrast in form results from changes in the shape and mass of landforms or structures. The degree of change depends on how dissimilar the introduced forms are to those continuing to exist in the landscape.

[3] Contrasts in line results from changes in edge types and interruption or introduction of edges, bands, and silhouette lines. New lines may differ in their sub-elements (boldness, complexity, and orientation) from existing lines.

4.18.1.2 Selection of Key Observation Points

The contrast rating is completed from the most critical viewpoints, or Key Observation Points (KOPs). The intent of establishing KOPs is to visualize the contrast created by the proposed action from locations most representative of how the public perceives the affected landscape. The "public" may include highway travelers, travelers on local roads, residents in surrounding interspersed private lands, off-highway vehicle users, dispersed recreational users in surrounding wilderness areas, or users of BLM facilities, such as long-term visitor areas. The sensitivity of these diverse user groups to changes in the landscape are influenced by a number of factors, including how prominent the view of the proposed action is (in terms of scale, distance and angle of observation), the frequency and duration that viewers are exposed to the view, and whether the viewer groups are aware of their surroundings or expectant of high-quality views.

Based on the above factors, and in consultation with BLM staff, eight KOPs (Figure 45) were selected to evaluate the BSPP site's existing conditions and potential visual impacts. No KOPs were selected in the surrounding BLM wilderness areas because they are located in the background zone, the level of use is low, and the BSPP would be visible from only a small fraction of the wilderness lands (see Figure 23). However, KOP 8 is included to represent an elevated view of the BSPP that could be experienced by low numbers of dispersed recreational users on open trails and roads in the McCoy and Big Maria Mountains. The location and characteristics of each KOP is summarized in Table 4.18-2.

TABLE 4.18-2
KOP LOCATION AND CHARACTERISTICS

ID	Name	View of	Distance Zone/ View Direction	User Type	View Exposure*
KOP 1	Midland Long-Term Visitor Area (LTVA)	Solar Arrays/Power Block	Background/ South-southwest	Visitors/ Campers	Seasonal use of LTVA by RVs, campers.
KOP 2	LTVA Entrance Kiosk	Solar Arrays/Power Block	Middleground/ Southwest	Day-use Visitors/ Motorists	Low traffic on Midland Rd.; seasonal use of LTVA by RVs, campers.
KOP 3	Mesa Bluffs Golf Community	Solar Arrays/Power Block	Middleground/ West	Recreation/ Residential	Facility users may experience view briefly, and some residents may have views of the project area from elevated west-facing windows.
KOP 4	Palo Verde Community College	Solar Arrays/Power Block/Transmission Lines	Middleground/ West	Students/ Staff	Students and staff may experience views for moderate periods from elevated west-facing windows.
KOP 5	Blythe Airport	Solar Arrays/Power Block/Transmission Lines	Middleground/ north-northwest	General Aviation	On-ground, view would be experienced briefly. In flight, project area would be highly exposed.
KOP 6	I-10 Westbound	Transmission Lines	Foreground/ West	Motorists	Numerous travelers exposed to view for brief periods
KOP 7	I-10 Eastbound	Transmission Lines	Foreground/ East	Motorists	Numerous travelers exposed to view for brief periods
KOP 8	McCoy Mountains	Solar Arrays/Power Block/Transmission Lines	Middleground/ East	Dispersed Recreational Users	Low use by backcountry travelers who would be exposed to the view for brief to moderate periods in topographically-favored areas.

These KOPs were chosen to represent a mix of user types and viewer exposures. The visual contrast created by the BSPP is rated using simulations from each of these KOPs, and is used to represent the visual change experienced from different locations and viewer types.

4.18.1.3 Visual Simulations

KOP photos were taken with a 35mm camera and fixed 50mm lens, with a resulting horizontal field of view of approximately 40 degrees. This field of view approximates the actual field of view experienced in the field if viewed as a 10-inch wide image at a reading distance of about one foot. Computer modeling and rendering techniques were used to produce the simulated images of the views of the site as they would appear from each KOP after the completion of construction. Existing topographic and engineering (ArcGIS and AutoCAD) data were utilized to construct 3D (eye level height [5.5 feet]) digital and photographic images of the generation and linear facilities. These images were combined with the digital photography from each KOP to produce a complete computer-aided image of the power generating facility and portions of the transmission system.

4.18.2 Direct and Indirect Impacts

4.18.2.1 Proposed Action

There are no indirect impacts of the BSPP with respect to visual resources.

Project Appearance

The proposed action would convert approximately nine square miles of naturally-appearing desert plain to an industrial facility characterized by complex, geometric forms and lines and industrial surfaces that are dissimilar to the surrounding natural landscape character. An additional two square miles would be disturbed during construction. Much of the developed area would be covered with the arrays of parabolic mirrors that would be used to collect heat energy from the sun. Figure 46 presents an image of the Kramer Junction SEGS project solar troughs, which are smaller in scale than those proposed for BSPP, but provide a visual example of a solar plant using parabolic mirrors. Table 4.18-3 provides a list of the major project features that would contribute to the apparent visual change of the landscape. The arrays of parabolic mirrors would occupy most of the disturbed area, whereas the four identical power blocks would occupy smaller areas, but would contain various buildings and structures needed for electrical generation, including a 150-foot high air cooled condenser and an 80-foot high heat transfer fluid heater. These two structures represent the tallest buildings in each of the four proposed power blocks. The proposed high voltage transmission lines leading away from the main generation facility would be 140 feet high.

The BSPP has been proposed in a topographically favorable location for at least two reasons. First, the BSPP would be constructed at a somewhat higher elevation relative to I-10, the Blythe Airport, and the northwestern fringes of the City of Blythe. This would result in a greater potential for intervening topography to diminish or shield views of the project. Second, there are two subtle knolls along a southwest-trending line on to the south and east of the proposed action area. It is likely that these two topographic features would aid significantly in shielding the size and scale of the proposed action for areas at lower elevation.

TABLE 4.18-3
BSPP FACILITY/EQUIPMENT DIMENSIONS

Legend / Name	Dimensions (LxWxH) (Feet)/Capacity	Footprint (square feet)
Switch Yard	26 x 92	2,392
Overflow Vessel And Expansion Vessel	124 x 154	19,000 Ea
Ullage Coolers And Vessel	79 x 20	1,000
Nitrogen System	Incidental	800
Heat Transfer Fluid Heater	50 x 22 x 80 Stack	1,100
Steam Generators	90 x 10 x 24 Ea	900
Weather Stations are located on top of control house, and out in field	68 x 68 x 24	200
Parking	18 x 60	1,080
Balance Of Plant Electrical Building	67 x 67 x 24 (Two Level Bldg)	4,500
Reheaters	32 x 10 Ea	320
MCC Cooling Tower	33 x 40 x 32 High	1,320
Steam Turbine	111 x 50 x 40 High	5,500
Deaerator	125 x 57	7,100
Vacuum System	19 x 35 x 24 High	665
Compressed Air System	25 x 25 x 24 High	625
Generator Circuit Breaker	20 x 30 x 20	600
Warehouse	68 x 146 x 30	10,000
Chemical Injection Skid	46 x 47 x 24	2,000
Wind Fences	30 High (East and West)	
Security Chain Link Fence	8 High	
Generator Step-Up Transformers	48 x 32 x 24	1,500
Emergency Diesel Generator	40 x 10 x 20	800
Cooling Tower	33 x 40 x 32 High	1,300
Water Tank (Ro Concentrate) (Ps1 Only)	45 Dia x 24 High / 250,000 Gal	1,590
Service Water Pumps	23' x 12' x 16'	275
Take Off Tower	30' x 35' x 50'	1,000
Blowdown Tanks	28' Dia Ea	570
Auxiliary Boiler	40' x 73' x 32'	2,900
Air Cooled Condenser	245' x 296' 120' High	73,000
Sample Panel & Lab Building	84' x 48' x 24' High	1,100
Demineralized Water Tank	16' Dia x 24' High	200
Water Treatment Area	192 x 148	28,000
Administration Building	60 x 60 x 24 High	3,600
Control Building	68 x 68 x 24 High	3,900
High Voltage Line	4 Dia x 140 High Poles	
Pipe Rack	35 ft high	
Treated Water Tank (also Firewater Storage)	91 Dia x 24 High / 1 Million Gal	6,500

Construction-Phase Impacts

During the construction period, earth-moving activities and construction materials, equipment, trucks, and parked vehicles, all could be visible on the site and along the transmission line ROW. Construction would occur over a 69 month period, during which a number of activities would take place, including large-scale vegetation removal, earthwork, operation of a concrete batch plant, as well as foundation and equipment installation. These construction activities would result in a high degree of visual contrast within the landscape, which would be similar or the same as the visual contrast effects discussed in Section 4.18.2.4 below for each KOP.

However, visual effects of construction could also include the generation of large quantities of airborne dust as well as nighttime construction lighting. The affected viewers would be motorists on I-10, a moderate number of residences at the Mesa Bluffs Golf Community, visitors of the LTVA, and dispersed recreational users. Although the construction period is estimated to be close to six years, construction would be phased, so that it would not occur in any one place for the entire period. Further, construction activities would be conducted in a manner that minimizes (visible) dust emissions, as described in Mitigation Measure AQ-SC3. These measures would include limiting the speed of vehicles, surfacing construction access roads, and controlling wind erosion on soil stockpiles and exposed earth. When nighttime construction activities take place, illumination would be provided that meets state and Federal worker safety regulations. To the extent possible, the nighttime construction lighting would be directed downward or toward the area to be illuminated and would incorporate fixture hooding/shielding, as described in Mitigation Measure VIS-3. Task-specific lighting would be used to the extent practical while complying with worker safety regulations. Disturbed areas that would not be needed during operation and maintenance of the BSPP would be revegetated according to Mitigation Measure VIS-2. Finally, earthwork and vegetation manipulation strategies in Mitigation Measure VIS-4 would assist in toning down the contrast created in earth-moving and vegetation clearing.

In summary, adverse visual effects associated with generation of large quantities of airborne dust as well as nighttime lighting during the construction period activities at both the proposed plant site and along linear routes would be reduced with the implementation of Mitigation Measures AQ-SC3, VIS-2, and VIS-3. The general visual contrast created by vegetation stripping and the presence of construction materials, equipment and partially constructed facilities would contribute to the visual contrast apparent in the landscape, which is addressed in the next section from the perspective of eight KOPs.

Operation-Phase Impacts

During the operation of the project, visual effects would be caused by the visible elements of the BSPP, as described in Section 4.18.2.1. The discussion below is divided between visual effects that are not captured by visual simulations (nighttime lighting and reflected sunlight/glare), and the visual contrast ratings of the project simulated in each KOP.

Light and Glare (all KOPs)

While the potential for glint or glare, as well as nighttime lighting, is a component of visual contrast, these issues are treated separately because the simulations used in the visual contrast rating process model the daytime visual change, and do not consider the effect of temporary glare.

Operational Lighting. BSPP operations would require onsite nighttime lighting for safety and security. The BSPP would be in an area with very few existing structures, and the use of uncontrolled or excessive lighting could be noticed by nearby motorists, residents of the Mesa Bluffs Golf Community, and could affect the nighttime experience for users of the Midland LTVA. As described in Mitigation Measure VIS-3, to reduce offsite lighting impacts, lighting at the facility would be restricted to areas required for safety, security, and operation. Exterior lights would be hooded, and lights would be directed on site so that light or glare would be minimized. This would prevent facility lighting from being directed upwards such that the night sky would be affected. Low-pressure sodium lamps and fixtures of a non-glare type would be specified. Switched lighting would be provided for areas where continuous lighting would not be required for normal operation, safety, or security. The implementation of these measures would minimize the amount of lighting potentially visible off site to the extent feasible. While these measures would not totally eliminate the light visible by surrounding user groups, facility lighting would be minimized and controlled such that it would not be a nuisance and would not detract from the ability for affected viewers to enjoy their surroundings.

Glint and Glare from Parabolic Mirrors. The large fields of parabolic mirrors could produce glint[4] and glare[5] at various times of the day. Potentially affected observers would be travelers along I-10 and nearby local roads; users of nearby BLM recreational access roads; visitors to the McCoy or Big Maria Mountains; and visitors and aviators accessing Blythe Airport. It is possible that the back reflected light or light not absorbed by both the envelope and steel annulus of the Heat Collecting Element (HCE) could produce glare, particularly when the viewer is positioned in line with the sun. This glare is more apparent as the viewer increases in distance and elevation relative to the BSPP. This glare could occur in any one place for several hours (e.g. a sunny afternoon) and would be similar in brightness and reflectivity as a water body or lake. At the time of moving into or out of stow position; the troughs have the potential to produce glint, which is the product of spread reflection of the direct image of the sun. This glint would be much more intense than the glare produced by diffused reflections, but would be momentary, and limited to periods shortly after dusk and shortly before dawn. During such periods, the bright spot would move as the observer changes position relative to the sun and mirror, with the result that the bright spot appears to “follow” the observer. Figure 47 presents an image of the Kramer Junction SEGS project solar troughs, which are smaller in scale than the proposed BSPP, but provides an example of glint that could occur momentarily at certain times of the day.

4 A flash of light, also known as a specular reflection, produced as a direct reflection of the sun in the parabolic mirror surface.

5 A continuous source of excessive brightness, relative to ambient lighting, also known as diffused reflections.

The glint or glare produced by the BSPP would likely be more intense than any other natural or cultural features in the observer's perspective. Glint from the solar arrays could be distracting or nuisance-causing, even from locations relatively distant from the BSPP. Glare produced by diffuse reflections would increase the visual contrast of the BSPP in the landscape, but would not be quite as intense or distracting. The BSPP would include a 30 foot-high wind fence on the east and west borders of the solar field, substantially diminishing or eliminating glint and glare effects for viewers east and west of the BSPP at similar elevations. For all other viewers, the reflected sunlight from the parabolic mirrors would contribute to the visual contrast created by the BSPP, even if momentary, because the effect would be noticed by most, if not all affected viewers, and would begin to dominate the character and views of the surrounding landscape. Because the design and operation of the solar arrays is integral to generating power for the BSPP, the face of the parabolic mirrors cannot be color treated or dulled.

Several measures are available that would reduce the potential for and frequency of intense or distracting glare from the solar fields. Mitigation Measure TRAN-9 would require the mirrors to be (1) brought out of stowage before sunrise and aligned to catch the first rays of the morning sun; and (2) returned to stow position after sunset. This would prevent bright flashes due to movement in or out of stow position. The mitigation also requires mirror function to be continuously monitored both by operators and by system controls, and to ensure that any malfunctioning mirrors be automatically turned east in a manner that prevents reflection from the sun as the sun continues west. VIS-1 and BLM-VIS-1 would ensure that reflective surfaces be painted or treated so long as it would not impair proper function of the equipment or structure.

These mitigation measures would avoid bright spot reflection associated with moving in and out of stow position, and would reduce the extent of reflective surfaces within the solar fields. However, the mitigation measures cannot prevent or reduce spread reflection off the face of the parabolic mirrors when out of stow position. The contribution of glint and glare will be considered in the contrast discussion of each KOP below.

Glare from Power Block Buildings, Administrative Buildings, and Transmission Lines. Potential glare from power block facilities and the high-voltage transmission lines would be less intense and distracting, and would be reduced by applying mitigation measure VIS-1 and BLM-VIS-1. This would require that transmission lines be finished with non-specular and non-reflective material, and the insulators to be non-reflective and non-refractive. Building and structure paints and finishes would be selected to blend with the landscape. These measures would prevent glare or reduce glare to minimal levels that would not be noticeable to potential viewers.

Visual Contrast Ratings

To analyze the visual contrast in the landscape created by the BSPP, the proposed action is simulated in photographs of the area for each of the KOPs described in Section 4.18.1.2. Figures 48 through 55 present both the existing and simulated conditions at each of the eight KOPs. Conclusions on the visual contrast of the BSPP presented below do not take into consideration the nighttime contrast (lighting), which is discussed above. Documentation of the

visual contrast ratings (BLM Form 8400-4, Visual Contrast Rating Worksheet) is included in Appendix G. A contrast rating worksheet is not available for KOP-8 and thus the visual contrast rating is discussed fully in text.

KOP-1: Midland Long-Term Visitor Area (LTVA). This KOP represents the view for users of the Midland LTVA campground entrance (Figure 48). KOP-1 is located approximately 6.8 miles northeast of the site; approximately 7.8 miles north of the nearest power block facilities and 9.8 miles northeast of the transmission line. The distance and the low angle of view greatly diminish the dominance and scale of the BSPP in views of the landscape. This is due to perspective foreshortening, which reduces the apparent size of surfaces of areas or objects, when seen obliquely or at low viewing angles. Further, the line contrast created by the BSPP is weak because it is coincident with the flat horizon line of the valley floor. From the vantage point in Figure 48, the BSPP could appear as a distant lake, which would be out of character with the desert landscape, but would not necessarily detract from scenic quality. The color and texture of the solar fields appears in moderate contrast to the colors and textures characteristic of the surrounding landforms and vegetation. From this distance, the power block facilities and transmission lines are indistinguishable from the solar fields, or out of view, and would go unseen by most viewers. The contrast and visibility of the BSPP from KOP-1 would vary according to atmospheric conditions, but would only be seen for brief periods from the KOP as users of the Midland LTVA enter the campground.

In summary, the BSPP, as seen from KOP-1, would result in a weak visual contrast in form and texture, but a moderate contrast in line and color. Thus, the BSPP creates a weak to moderate contrast depending on the design element. The dominant landscape composition is of a panoramic desert landscape punctuated by prominent mountains in the background. The BSPP does not detract from this landscape composition due to the distance and low angle of view, and would not attract the attention of the casual observer, except during times when the solar arrays generate substantial glint (bright spot reflection). The simulation for this KOP demonstrates conformance with Class III Interim VRM objectives; however, at times when the solar fields generate glint, the BSPP would be a major focus of viewer attention, and would not conform to VRM Class III objectives. The visual contrast created by the BSPP shall be reduced by applying Mitigation Measures TRAN-9, VIS-1, VIS-2, VIS-4, and BLM-VIS-1. Mitigation Measure TRAN-9 would prevent bright flashes due to movement in or out of stow position, but would not fully mitigate the effects of glint and glare.

KOP-2: LTVA Entrance Kiosk. This KOP represents the view for motorists and day-use visitors of the Midland LTVA (Figure 49). KOP-2 is located approximately 4.4 miles northeast of the site; approximately 5.7 miles north of the nearest power block facilities and 7.5 miles northeast of the transmission line. The Midland LTVA accommodates visitors who wish to camp for as long as seven consecutive months or for short periods during the season of its operation (which runs from September 15 through April 15). Thus, while the number of users is generally low, they could experience views of the BSPP for extended periods of time.

The visual contrast created by the BSPP is largely similar as described above for KOP-1, except that KOP is located two miles closer. Perspective foreshortening still greatly diminishes the scale and dominance of the BSPP in the view, but because the proposed action is in closer proximity, individual power block buildings become distinguishable. The high voltage transmission lines, however, remain out of view. While power block structures are quite small at the distance viewed, they create a moderate contrast in form, line and color with the flat horizon line of the valley floor. The light, uniform colors of the structures are uncharacteristic of the colors and textures apparent in the natural landscape.

While seen from a distance and reduced in scale, the power block structures could possibly attract the attention of observers who are highly sensitive to changes in the landscape, such as users of the LTVA who have become accustomed to the largely unmodified landscape setting. However, it is unlikely that the contrast created by the power block structures would attract the attention of the casual observer. The simulation for this KOP demonstrates conformance with Class III Interim VRM objectives; however, at times when the solar fields generate glint, the BSPP would be a major focus of viewer attention, and would not conform to VRM Class III objectives. The visual contrast created by the BSPP shall be reduced by applying Mitigation Measures TRAN-9, VIS-1, VIS-2, VIS-4, and BLM-VIS-1. Mitigation Measure TRAN-9 would prevent bright flashes due to movement in or out of stow position, but would not fully mitigate the effects of glint and glare, resulting in non-conformance with VRM Class III objectives when glint is observed. Implementation of Mitigation Measure VIS-1 and BLM-VIS-1 would paint the buildings and the back of the parabolic mirrors in colors compatible with the surrounding landscape, reducing the color contrast of the power block buildings and solar fields. Mitigation Measure VIS-2 and VIS-4 would also aid in reducing the visual contrast of the BSPP through restoration of temporarily disturbed areas and proper design fundamentals.

KOP-3: Mesa Bluffs Golf Community. This KOP represents the view for users of the Mesa Bluffs Gold Community, which would include users of the golf course in addition to residences with views of the affected area (Figure 50). KOP-3 is located approximately four and 6.2 miles northeast of the site and transmission line, respectively, and is intended to approximate the views that could be experienced by the golf community. This community area consists of approximately 400 residential dwellings. In 2008, the course had approximately 30,000 rounds of golf. The community and golf course is described as “situated high on a bluff surrounding the Blythe Municipal Golf Course. Views from the bluff are spectacular, offering not only golf course views, but also views of the distant mountains, Colorado River, and the green patchwork of irrigated farmland below” (Mesa Bluffs Development Company, LLC, 2010). This indicates that the primary visual attraction is the elevated view of the Palo Verde Valley to the southeast, rather than the area affected by the BSPP (which is in the opposite direction). More generally, however, the golf community is likely to place value on the visual setting and could be sensitive to visual changes in the landscape caused by the BSPP. Existing cultural modifications visible in middleground views of this KOP have already detracted slightly from the natural landscape character.

The visual contrast created by the BSPP in Figure 50 is greater than the simulations for KOPs 1 and 2, because this view is located closer, and the solar fields create a greater line contrast with the surrounding landforms. Relative to KOPs 1 and 2, the visual contrast is increased in intensity, but it remains weak to moderate depending on design element. The simulation for this KOP demonstrates conformance with Class III Interim VRM objectives; however, at times when the solar fields generate glint, the BSPP would be a major focus of viewer attention, and would not conform to VRM Class III objectives. The visual contrast created by the BSPP shall be reduced by applying Mitigation Measures TRAN-9, VIS-1, VIS-2, VIS-4, and BLM-VIS-1. Mitigation Measure TRAN-9 would prevent bright flashes due to movement in or out of stow position, but would not fully mitigate the effects of glint and glare, resulting in non-conformance with VRM Class III objectives when glint and glare are observed. Implementation of Mitigation Measure VIS-1 and BLM-VIS-1 would paint the buildings and the back of the parabolic mirrors in colors compatible with the surrounding landscape, reducing the color contrast of the power block buildings and solar fields. Mitigation Measure VIS-2 and VIS-4 would also aid in reducing the visual contrast of the BSPP through restoration of temporarily disturbed areas and proper design fundamentals.

KOP-4: Palo Verde Community College. This KOP represents the view for students, teachers and visitors at the Palo Verde Community College (Figure 51). KOP-4 is located approximately three miles east of the site, 4.2 miles east of the nearest power block facilities, and five miles east of the nearest transmission line. Last academic year, the Community College served 7,735 students, dispersed between three locations (out of town, in town, and Needles Campus). Additionally, there are approximately 236 staff/faculty/maintenance personnel, dispersed between the three locations. Potential viewers at Palo Verde Community College could be exposed to views of the BSPP for moderate periods of time, but would not be as sensitive to visual changes in the landscape because the purpose of their visit is not recreation or scenic quality.

The conclusions on visual contrast, conformance with VRM objectives, and mitigation strategies are the same as discussed above for KOP-3.

KOP-5: Blythe Airport. This KOP represents the view for users on the ground at the Blythe Airport (Figure 52). KOP-5 is located approximately 2.4 miles south of the site; 3.6 miles southeast of the nearest power block facilities and 1.8 miles east of the nearest transmission line. This is a general aviation airport located to the southeast of the proposed solar facility location. There are an average of 69 operations per day (2006 data), 50 percent transient and 50 percent local.

The assessment and conclusions on visual contrast, conformance with VRM objectives, and mitigation strategies are the same as discussed above for KOP-1.

KOP-6: I-10 Westbound near the Project Transmission Line. This KOP represents the view of the transmission line for motorists traveling westbound on I-10 (Figure 53). KOP-6 is located approximately 0.2 miles east of the transmission line. The transmission line is approximately 150 feet high and would add industrial features with prominent vertical and curvilinear lines to the foreground landscape. Although the strong vertical lines of the steel poles would contrast with

the prevailing horizontal lines of the mesa and the irregular ridgelines of the mountains beyond, nearby transmission line structures do exhibit similar linear characteristics, though at a smaller and less noticeable scale. The resulting visual contrast caused by these industrial characteristics and contrasting features would be moderate to strong, and would be only briefly experienced by motorists.

The high voltage power line in KOP-6 has a moderate to strong contrast, and is quite prominent in the view, and thus may momentarily attract the attention of some highway travelers as the power line comes into view. Due to the straight and flat nature of I-10, the transmission structure could be in motorists' view for several minutes. I-10 is a utility corridor, is paralleled by an existing transmission line, and contains scattered structures similar to the right side of the road in Figure 53. The transmission line is thus not wholly out of character with the visual features of the highway corridor. However, because of the strong line contrast generated by the transmission line, and because galvanized towers may often generate glare (if not properly treated), the structure would not be in conformance with Class III objectives (for the area along and south of I-10) or with Class II objectives (for the area north of I-10). Mitigation measure VIS-1 would ensure that transmission line conductors shall be non-specular and non-reflective, and the insulators shall be non-reflective and non-refractive. The surface treatment would reduce glare, but the strong line contrast created by the structure would remain, and thus the transmission line would remain in non-conformance with Class II and Class III objectives.

KOP-7: I-10 Eastbound near the Project Transmission Line. This KOP represents the view of the transmission line for motorists traveling eastbound on I-10 (Figure 54). KOP-7 is located approximately 0.2 miles west of the transmission line. The proposed transmission line would add industrial features with prominent vertical and curvilinear lines to the foreground landscape. Such characteristics are not prominently visible in the existing landscape in the vicinity of the span. Although nearby transmission line structures south of I-10 do exhibit similar linear characteristics, the strong vertical lines of the steel poles would contrast with the prevailing horizontal lines of the mesa and the irregular ridgelines of the mountains beyond. The resulting visual contrast caused by these industrial characteristics and contrasting features would also be moderate, and would be only briefly experienced by motorists.

For the same reason described in KOP-6, the BSPP transmission line, as seen from KOP-7, would not be in conformance with Class III objectives for areas north of I-10, but would conform to Class III objectives for areas along and south of I-10.). Mitigation measure VIS-1 would ensure that transmission line conductors shall be non-specular and non-reflective, and the insulators shall be non-reflective and non-refractive. The surface treatment would reduce glare, but the strong line contrast created by the structure would remain, and thus the transmission line would remain in non-conformance with Class II objectives for areas north of I-10.

KOP 8: McCoy Mountains. This KOP represents the view of the BSPP for dispersed recreational users in the McCoy Mountains (Figure 55). KOP-8 is located approximately two miles from the nearest portion of the BSPP. While the number of viewers who could experience the exact perspective presented in Figure 55 is low, this KOP is included to represent the

appearance of the BSPP from elevated viewpoints, where the scale and extent of the BSPP is not so greatly diminished by the low angle of view. Elevated views of the affected area would also be available from the Big Maria and Little Maria Mountains, which can be accessed from several open NECO routes. Because dispersed recreational users in the mountains could experience the views for long periods of time, and value the visual quality of the surroundings, they are considered a user group with a high sensitivity level.

From this elevated perspective, the scale and dominance of the BSPP begins to become apparent. The contrast in form is weak, because the BSPP continues the flat shape of the valley floor and does not impair the forms displayed by the surrounding mountains. However, the contrast in line, color and texture is strong. In the context of the landscape unit (SQRU No. 19 - Chuckwalla Valley), the straight lines created by the outer edges of the solar fields contrast sharply with the curvilinear lines imparted by the numerous desert washes emanating from the mountains. The light, reflective color of the solar panels would be in sharp contrast with the brown and tan hues of the valley; and the repeated lines of parabolic troughs would be in contrast with the scattered patchworks of vegetation on the valley floor. The contrast in color would increase when glare is produced (during times of the day when the viewer, the sun and the solar arrays are in line).

The BSPP would attract the attention of even a casual observer of the landscape from this perspective. The level of change to the landscape would be strong, and the existing character would be significantly altered. For these reasons, the BSPP would not be in conformance with the Interim VRM Class III objective, which is to retain the existing character of the landscape. Several mitigation strategies are available to aid in reducing the adverse effects, including VIS-1 through VIS-4, BLM-VIS 1 and TRAN-9, but they cannot feasibly reduce the scale and contrast created by the BSPP with respect to the design elements of line, color and texture. For this reason the effect on the BSPP from KOP-8 is considered adverse and unavoidable.

Impacts to Special Designations (Wilderness Areas)

Figure 23 shows designated wilderness areas overlain on a viewshed map of the proposed action. While views of the BSPP would generally be from elevated viewpoints similar to KOP 8, the areas of designated wilderness from which the BSPP could be seen would be located much farther away, greatly diminishing the portion of views occupied by the BSPP.

The Palen/McCoy Wilderness is approximately four miles northwest of the BSPP site boundary. Approximately 1,020 acres of the Palen/McCoy Wilderness is within the BSPP viewshed. These areas are generally elevated with a favorable topographic orientation. Visitors to this wilderness area would have views of the BSPP as they travel through areas within the BSPP viewshed. However, the BSPP is unseen from the vast majority of wilderness land due to intervening mountain ranges (such as the McCoy and Little Maria Mountains). For these reasons, impacts would be minor.

The Big Maria Mountains Wilderness and Rice Wilderness are located approximately seven miles to the northeast, and 13 miles to the north of the BSPP site boundary, respectively. Approximately 4515 acres of the Palen/McCoy Wilderness and about 696 acres of the Rice

Wilderness are within the BSPP viewshed. Users of these areas would be able to view the BSPP, but opportunities for solitude and unconfined recreation would not be greatly impacted due to the small fraction of the wilderness area from which the BSPP could be seen and the distance of the BSPP from the wilderness area. Where visible, the BSPP area would constitute a small portion of the views, which would be open, unobstructed, and dominated by natural landscape features (e.g. mountain ranges, broad valleys, open sky). For these reasons, impacts would be minor.

The Little Chuckwalla Mountains Wilderness is located 14 miles to the southwest from the BSPP site boundary. Because of intervening topography, only the offsite linear facilities of the BSPP would be visible from the Little Chuckwalla Mountains Wilderness. At such great distances, the linear alignment would be barely noticeable and would only be visible from a small fraction of the total wilderness area. For these reasons, adverse effects would be minor.

Decommissioning

The purpose of decommissioning is to remove BSPP-related structures and infrastructure so that affected lands could naturalize. However, until vegetative restoration is achieved, adverse visual impacts would be similar to those described in the operation-phase impacts, because large areas would be devoid of desert scrub vegetation. Visual effects from the proposed transmission lines would be likely to remain, however, since it seems likely that, once in use, such lines would remain in use regardless of whether the energy they transfer is generated by the BSPP or another project. The impacts of decommissioning would be somewhat reduced in intensity, however, as compared to construction, because the contrast in color created by the power block structures and solar arrays would be removed. The contrast in the design elements of form and line would remain. Implementation of VIS-2 and VIS-4 would aid greatly in reducing the visual effects of decommissioning. VIS-2 would require the Closure, Revegetation and Rehabilitation Plan to include reclamation of the area of disturbed soils used for laydown, project construction, and siting of the other ancillary operation and support structures. Further, VIS-4 would reduce the amount of disturbed area and blend the disturbed areas into the characteristic landscape. It would require replacement of soil, brush, rocks, and natural debris over disturbed areas. Newly introduce plant species would be of a form, color, and texture that blends with the landscape. These measures would ensure the visual impacts of decommissioning are minor and short-term.

4.18.2.2 Alternatives

Reconfigured Alternative

The Reconfigured Alternative would not substantially reduce the visual effects of the BSPP. In fact, the same number of solar fields would be scattered over a greater land area, thereby potentially increasing the portion of the horizon occupied by the BSPP in KOPs 1 though 5. However, the increased portion of the horizon line occupied by the BSPP would not be substantial enough to change the contrast determinations. The Reconfigured Alternative would result in no change to the conclusions drawn in the analysis of the proposed action.

Reduced Acreage Alternative

This alternative would not substantially reduce the visual effects of the BSPP. From the perspectives presented in KOPs 1 through 5, the portion of the horizon line occupied by the BSPP would not change in any visually apparent way, due to the geometry of the Reduced Acreage Alternative. For KOPs 6 and 7, there would be no change because the transmission lines would remain under this alternative. For KOP 8, the area occupied by the BSPP would be reduced, thereby reducing the size and scale of the project; however, the degree of visual contrast created in the landscape, in terms of color, line and texture, would remain the same. Thus, the conclusions on visual contrast for the reduced acreage alternatives would be the same as the proposed action.

No Action Alternative A

Because there would be no amendment to the CDCA Plan and no solar project approved for the site under this alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site. As a result, none of the construction- or operation-related visual resources impacts from the proposed action would occur.

No Action Alternative B

Because the CDCA Plan would be amended to make the area unavailable for future solar development, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site. As a result, the visual resources of the site would not be expected to change noticeably from existing conditions and, as such, No Action Alternative B would not result in visual resources impacts.

No Action Alternative C

Under No Action Alternative C, future solar energy development could be expected to affect visual resources to the same degree and extent as referenced in the proposed action. For example, if the acreage of the solar energy developed is 50 percent less than the proposed action, then impacts to visual resources would be 50 percent less intense.

4.18.3 Discussion of Cumulative Impacts

Impacts resulting from construction, operation, maintenance and decommissioning of the BSPP could result in a cumulative effect on visual resources with other past, present, or reasonably foreseeable future actions. The geographic scope of the cumulative effects analysis for visual resources consists of the I-10 corridor (where visual impacts could be synergistic), and locations from which a viewer could see the proposed action along with views of other projects (where visual impacts could be additive). This geographic scope of cumulative impacts analysis was established based on the natural boundaries of the affected resource, i.e., potential shared viewsheds, and not on jurisdictional boundaries. Potential cumulative effects on visual resources could occur during the BSPP’s proposed 69-month construction period (e.g., from cumulative

construction disturbances), during the projected 30-40 year lifespan of the proposed action (e.g., project contrast with the landscape, glint and glare), or result from closure and decommissioning (e.g., until restoration efforts return the landscape to its original condition).

Existing conditions within the area of cumulative effects analysis reflect a combination of the natural condition and the effects of past actions and are described in FEIS chapter 3. Direct and indirect effects of the BSPP are analyzed above. Past, present and reasonably foreseeable future actions making up the cumulative scenario are identified in Section 4.1. Among them, projects such as the Genesis, Rice, Palen and Desert Sunlight solar power projects are expected to result in synergistic visual impacts for travelers along I-10, as well as visual impacts to dispersed recreational users in the surrounding mountains.

4.18.3.1 Motorists on I-10

Visual changes as a result of other projects in the cumulative scenario would not be within the line of sight for travelers along I-10 viewing the BSPP. However, the combined effect of large-scale landscape alterations that would be visible along the length of I-10 within the CDCA Plan area could substantially degrade the visual character and the general scenic appeal of the landscape.

Numerous existing cultural modifications are visible from the I-10 corridor, including transmission lines, pipelines, 4-wheel drive tracks, and widely scattered facilities and structures; however, the general character is of an unimpaired, isolated desert landscape. The cumulative scenario includes many large-scale solar plants whose scale, potential glare, and pervasiveness would have adverse cumulative effects. If all the cumulative projects included in Section 4.1 were to be implemented (which is considered unlikely), they would convert about 123,592 acres along the I-10 corridor between roughly Desert Center and Blythe (approximately 50 miles) from an undeveloped desert viewshed to a more industrialized appearance (mostly with large solar array fields using both thermal and photovoltaic technologies).

In many cases, the apparent scale of the projects from motorists' perspective would be diminished greatly by favorable topographic relationships. The cumulative projects are at the same or similar elevation as the highway, and are reduced in prominence due to their distance from the highway and low angle of view. In many cases, the other projects in the cumulative scenario would blend in with the horizon line of the valley floor, and the rugged mountains would remain the dominant visual features in the landscape. In spite of this, because the landscape is currently undeveloped and valued by visitors for its isolated and unspoiled condition, the addition of numerous new large-scale solar projects would substantially degrade the scenic experience for many travelers along I-10, due to the projects' industrial character and visual contrast. Mitigation measures are available that reduce the color contrast of structures, or the line contrast of vegetation clearing; but the measures reduce the contrast of certain features of the projects at various distances. No mitigation measure is available that would be sufficient to address features of the project that result in the most contrast in the landscape: the large-scale, color and reflectivity of the BSPP's solar fields. Thus, the cumulative scenario would present an unavoidable and adverse impact for travelers along I-10.

4.18.3.2 Dispersed Recreational Users in Surrounding Mountains

Dispersed recreational users in the Palen-McCoy and Big Maria Mountains Wilderness surrounding the BSPP—due to their elevated position and access to unencumbered, panoramic views of the valley below—could experience both additive and synergistic impacts in the cumulative scenario. The BSPP, along with other projects in the cumulative scenario, would not result in direct visual alteration to BLM wilderness areas; but the scale and contrast created by numerous renewable energy projects would greatly alter views of the valley floor experienced by wilderness users. Existing cultural modifications on the valley floor are largely limited to linear alignments (e.g., roads and transmission lines), or other structures that are diminished in importance due to the considerable distance from which they are viewed. However, the cumulative scenario presents numerous large-scale renewable energy projects that would be readily apparent to most wilderness users. The BSPP, in combination with other projects, would make the valleys surrounding the Palen-McCoy and Big Maria Mountains Wilderness appear increasingly industrialized, and could substantially diminish the remote and isolated character of the landscape. While use levels in the mountains and wilderness surrounding the BSPP are generally low, the remote and isolated character of the landscape is highly valued by its users, and could represent the primary attraction.

Available mitigation measures could not feasibly reduce the scale and contrast created by the projects in the cumulative scenario, especially from elevated viewpoints. Thus, the cumulative scenario presents an unavoidable and adverse impact for dispersed recreational users in surrounding, higher-elevation wilderness areas.

4.18.3.3 Alternatives

Cumulative impacts would vary by alternative to the BSPP only to the degree to which direct and indirect impacts would vary by alternative.

4.18.4 Summary of Mitigation Measures

The implementation of mitigation measures imposed by the Energy Commission as Conditions of Certification for the BSPP also would avoid or reduce impacts on the quality of the human environment. These mitigation measures are set forth in Appendix G. The following address impacts on visual resources.

VIS-1, VIS-2, VIS-3, VIS-4, TRAN-9, AQ-SC3

In addition, the following mitigation measure would be imposed by the BLM to avoid or reduce impacts on the quality of the human environment. The following mitigation measures would avoid or minimize impacts on visual resources:

BLM-VIS-1: The project owner shall paint power blocks structures and other vertical construction shadow gray as shown on the BLM Color Chart. The backs of solar troughs shall also be color treated to minimize color contrasts.

4.18.5 Residual Impacts after Mitigation Measures were Implemented

Residual impacts of the BSPP after implementation of mitigation measures would come from effects on the size and scale of the project. While mitigation measures VIS-1 through VIS-4 and BLM-VIS-1 would be helpful in reducing the level of contrast in form, line, color and texture for individual project features; the ability of these measures to reduce visual impacts decreases as the size and scale of the project increases. Thus, very few of the identified impacts are altogether eliminated through application of the proposed measures; however, the contrast in color and texture would be substantially reduced from several of the KOPs, with application of VIS-1 and BLM-VIS-1. Further, the impact of lighting, while not eliminated, also would be reduced substantially by implementation of VIS-3. The impact of glare is not fully mitigated with implementation of measure TRAN-9, but it is effective at preventing glint in the mornings and evenings due to movement of the mirrors in and out of stow position. Generally however, as the angle of view increases, the size and scale of the BSPP solar arrays would become the dominant contrasting factor because the surface of the parabolic mirrors could not be treated or painted to blend in with the landscape.

4.18.6 Unavoidable Adverse Impacts

The BSPP would cause three adverse impacts that cannot be mitigated; as such, these impacts would be unavoidable. These are discussed under the analysis of the proposed action, and summarized below:

1. Visual impacts to surrounding viewer groups (all KOPs) from sunlight reflected off of the parabolic mirrors (glare).

2. Visual impacts to dispersed recreational users in the McCoy, Big Maria, and Little Maria Mountains due to the size and scale of the BSPP. Non-conformance with VRM Class II objectives from KOP No. 8.

3. Unavoidable and adverse cumulative impacts for travelers along I-10 and dispersed recreational users in the McCoy, Big Maria, and Little Maria Mountains and wilderness.

4.19 Impacts on Water Resources

4.19.1 Impact Assessment Methodology

This analysis is based, in part, upon information from the following sources: the Application for Certification (AFC) (Solar Millennium 2009a), Supplement to the AFC (Solar Millennium 2009b); the Staff Assessment and Draft Environmental Impact Statement (CEC/BLM 2010) and the Revised Staff Assessment (CEC 2010). Additionally, technical reports and studies associated with these documents were also reviewed and considered in the preparation of this analysis.

4.19.2 Discussion of Direct and Indirect Impacts

Proposed Action

The flowing text provides an overview of groundwater supply and groundwater levels as relevant to both construction and operation of the BSPP, followed by a discussion of specific construction-period impacts, and finally specific operation-period impacts.

Groundwater Supply

The BSPP proposes to utilize underlying groundwater to supply water needs during construction. There is a concern that the water demand of the BSPP would exceed the groundwater basin budget and lead to overdraft conditions. The Palo Verde Mesa Groundwater Basin (PVMGB) lies in an area that is influenced by the Colorado River system. Currently, the PVMGB is in balance whereby inflow (approximately 6,700 acre-feet per year (ac-ft/yr)) to the basin equals outflow. As discussed in Section 3.19, inflow into the PVMGB occurs from the Palo Verde Valley Groundwater Basin, the Colorado River, and the Coachella Valley Groundwater Basin. It is anticipated that groundwater extraction during construction (about 820 ac-ft/yr) and operation (600 ac-ft/yr) would exceed the subsurface inflow from these sources and could thus place the basin into overdraft conditions if not balanced via increased subsurface inflow from the Colorado River. Total groundwater expected to be extracted from the PVMGB by the BSPP from construction through operation is approximately 22,100 ac-ft. The PVMGB has approximately 5,000,000 acre-feet in storage. The total amount extracted equates to approximately 0.44 percent of the available water in storage. This impact to the basin groundwater storage is minor. However, the BSPP's pumping would have an effect on the Colorado River by inducing subsurface flow from the river into the PVMGB.

The Applicant did not provide an analysis of the proportion of water originating from storage, from natural recharge, and/or from Colorado River underflow. The Applicant did provide analysis that demonstrates that the PVMGB is in dynamic contact with the Colorado River and its aquifer. Sufficient analysis was also provided to determine that McCoy Wash and all ephemeral streams within the PVMGB are tributary to the Colorado River. Therefore, it should be noted that the water in the Colorado River is fully appropriated, according to the Consolidated Decree of the Supreme Court of the United States in the case of *Arizona v. California, et al*. entered Match 27, 2006, (547 U.S. 150 (2006)), which states, "Consumptive use from the mainstream within a State shall include

all consumptive uses of water of the mainstream, including water drawn from the mainstream by underground pumping." The mainstream was indicated as "the mainstream of the Colorado River downstream from Lee Ferry within the United States, including the reservoirs thereon." "Tributaries" are defined in the Consolidated Decree to "mean all stream systems the waters of which naturally drain into the mainstream of the Colorado River Below Lee Ferry." The Colorado River Compact, 1922, upheld by this decree, defines the "Colorado River System" to mean "that portion of the Colorado River and its tributaries within the United States of America." The Colorado River Compact, 1922, further defines the "Colorado River Basin" to mean "all of the drainage area of the Colorado River System and all other territory within the United States of America to which the waters of the Colorado River System shall be beneficially applied." The Consolidated Decree goes on to state that the State of California is enjoined "from diverting or purporting to authorize the diversion of water from the mainstream the diversion of which has not been authorized by the United States for use in the respective States; provided, however, that no party named in this Article and no other user of water in said States shall divert or purport to authorize the diversion of water from the mainstream the diversion of which has not been authorized by the United States for its particular use."

The U.S. Geological Survey has indicated that the PVMGB lies within a basin tributary to the Colorado River and wells drawing groundwater will be considered withdrawing water from the Colorado River (Wilson et al., 1994). The USGS developed an accounting surface for determination of whether water was being drawn from the mainstream of the Colorado River. The accounting surface for the BSPP site ranged from 248 to 252 feet above mean sea level (amsl). Groundwater levels at the BSPP site were reported in 2009 at approximately 253 feet amsl (AECOM, 2010) and are anticipated to drop below the accounting surface during BSPP operations by between 4-15 feet. Correspondingly, all or a portion of the groundwater production at the site will be considered Colorado River water. Consequently, the BSPP has the potential to divert Colorado River water and that part, if not all of the water, would come from the Colorado River Basin. At least one current owner of water rights has proposed selling Colorado River water for use on this project.

Groundwater Levels

An existing numerical groundwater model developed by the US Geologic Survey (Leake et al., 2008) was used by AECOM (2010) to evaluate potential impacts from proposed BSPP pumping. The basis for use of the model included that:

1. The model included the BSPP site and was of sufficient detail and complexity to adequately evaluate impacts from the modest pumping proposed for the BSPP.

2. It had undergone review by the USGS and USBR. As such, the model had undergone significant peer review prior to being published.

The regional model used by AECOM (2010) is a two-dimensional superposition model developed using MODFLOW code (Harbaugh, 2000) for the Parker-Palo Verde-Cibola area, which includes the PVMGB and the BSPP site. The model employed a simple vertical geometry and a large grid spacing to evaluate the impacts from groundwater pumping on the Colorado River. Major features of the model include:

1. Two statistically derived low (conservative) and average transmissivity values (6,300 feet squared per day [(ft^2/d)] and 26,000 ft^2/d, respectively).

2. A constant storage coefficient or specific yield (0.2).

3. A uniform saturated thickness of the aquifer (500 feet).

4. Non-uniform grid spacing:

    a. Near-pumping-well grid spacing of 30 feet within 300 feet of well;

    b. 100 feet grid spacing within 1 mile of well;

    c. Gradually increasing grid spacing, from 100 feet to 1,320 feet, for the remainder of the model domain.

The existing USGS model was customized by AECOM (2010) using the site specific data from an aquifer test conducted during onsite investigations. Two newly constructed pumping wells were assumed to be located within the BSPP site, with both wells located on site. The area of the impact zone from the pumping well was determined based on results from sensitivity model runs. The entire model domain was divided into two zones: one that represented the well impact area and the other that represented the remainder of the model area. For Zone 1, both site specific and existing hydraulic parameters were used for simulations; for Zone 2, however, only existing hydraulic parameters were used because there are no additional data available at the time of this investigation.

The USGS model employed to evaluate impacts in the August 2009 AFC assumes a homogeneous aquifer in which aquifer parameters (i.e., transmissivity and specific yield) are uniformly applied across the model domain. In the evaluation conducted in the AFC, the model was used to conduct an analysis of the potential impacts from proposed groundwater pumping to supply water for the BSPP. At the time, no site specific aquifer data were available, so the aquifer property values determined by USGS were used across the model domain.

Subsequent to the submission of the AFC, additional site investigation was conducted and a pumping test completed on the BSPP site by the Applicant (AECOM 2010). In addition, information was provided through the BLM on the proposed activities within the PVMGB such that the cumulative impacts assessment provided in the AFC could be refined using the numerical groundwater model. To reflect these additional data, the USGS model was updated in response to the data requests providing:

1. An update to BSPP-only pumping impacts using site specific and regional aquifer characteristics;

2. An update to an assessment of cumulative impacts from other proposed activities within the Chuckwalla Valley Groundwater Basin using recent information provided by BLM on proposed water supply; and

3. A sensitivity analysis expanding beyond what was provided in the AFC to include additional transient simulations varying the transmissivity and storativity.

The aquifer test used a former water supply well onsite and two observation wells to assess aquifer characteristics below the BSPP site. The values from the testing tended to be well within the range of prior values reported by others and those used by the USGS. The transmissivity values were estimated to be between 10,000 square feet per day (ft^2/d) and 28,000 ft^2/d. Some of the storage estimates were within the range reported by Leake et al. (2008), though some were well outside the range used by the USGS in their model (0.05 to 0.2). The variation in some of the estimates could be a function of the partial penetration of the observation wells and variation beyond some of the bounding assumptions for application of the equations to estimate storage.

To incorporate the aquifer testing data, the model domain was portioned into zones, with the zone incorporating the pumping well inclusive of the range of aquifer characteristics from the testing and the zone outside this area incorporating those transmissivity and storage values used by the USGS in their modeling. Zone 1 is delineated based on the most conservative radius of influence obtained from sensitivity analysis. In doing so, the more conservative impact can be assessed. For example, in the analysis conducted for the AFC, the lowest transmissivity value (i.e., 10,000 ft^2/d) applied near the BSPP site test well is identical with the other areas of the model domain. Using the aquifer testing data in this update, two of three additional simulations were conducted using lower transmissivity value from the recent aquifer test (i.e., 10,000 ft^2/d) around the well. The zone established using the lower transmissivity value to the distance of a drawdown of one foot was used to set the extent of Zone 1 in all model runs.

Zone 1 is bounded by an area that centers at the BSPP well with a radius of about 26,000 feet, the large radius of influence at one-foot drawdown from the sensitivity analysis (see Table 4.19-1, *Results of Numerical Modeling for Proposed BSPP*, Model Runs 17 through 19, below). As discussed in Chapter 3.20, Water Resources, no springs or other surface water features are located in the vicinity of the BSPP site. McCoy Spring is located on the other side of the McCoy Mountains, to the west of the BSPP site. However, the intervening McCoy Mountains are expected to function as an impermeable barrier to groundwater movement, and therefore the BSPP would not affect any seeps or springs on the opposite side of the mountains. There are 15 surface water sites that are located in the PVVGB, within 10 miles to the east of the BSPP site. According to the National Water Information System Database of Water Resources of the United States, these features are likely canals or streams that collect agricultural runoff from adjacent farmlands. However, due to their relative distance from BSPP wells, and because they are likely supplied primarily by agricultural water return flows, these sites are expected to be only minimally affected by BSPP related groundwater pumping.

The modeling results suggest that during the life of the BSPP, groundwater level declines of five feet or more would be located at a distance of less than 1,100 feet from the proposed production well. The closest existing well is located a distance of 9,000 feet from this well.

Construction

Surface Water Drainage and Water Quality

Construction of the BSPP would require the use of heavy machinery for vegetation grubbing, grading, and installation of roads, pipelines, generation facilities, transmission facilities,

TABLE 4.19-1
RESULTS OF NUMERICAL MODELING FOR PROPOSED BSPP

Model Scenario	Objective	Zone 1		Zone 2		Year[a]	Maximum Draw-down (feet)[b]	Distance (in feet) from Production Well Field to one-foot Contour[c]	Distance (in feet) from Production Well Field to five-ft Contour[c]	Storage Change (acft)	Storage Change (percent of Recover-able)[d]
		Trans-missivity (ft^2/d)	Storativity (unitless)	Trans-missivity (ft^2/d)	Storativity (unitless)						
Run 1	BSPP only impacts assessment using only the single well on the BSPP site.	10,000	0.2	6,300	0.2	2015	7.9	10,000	<2,500	5,000	0.10%
						2029	4.4	---	---	13,400	0.30%
						2043	5.2	20,000-24,000	<2,500	22,200	0.49%
Run 2	BSPP only impacts assessment using only the single well on the BSPP site.	28,000	0.2	26,000	0.2	2015	3.3	~6,000	0	5,000	0.11%
						2029	1.7	---	0	12,600	0.28%
						2043	1.9	14,000-20,000	0	19,500	0.43%
Run 17	Determines relative sensitivity of the aquifer parameters and a conservative radius of influence for Zone 1 delineation	28,000	0.02			2015	7.08	42,839	95	3,100	0.06%
						2029	4.82	69,295	0	5,200	0.10%
						2043	4.91	69,295	0	6,300	0.13%
Run 18	Determines relative sensitivity of the aquifer parameters and a conservative radius of influence for Zone 1 delineation	28,000	0.2			2015	5.83	5,005	15	3,900	0.08%
						2029	3.83	7,227	0	11,500	0.23%
						2043	4.02	18,424	0	17,700	0.35%
Run 19	Determine relative sensitivity of the aquifer parameters and a conservative radius of influence for Zone 1 delineation	10,000	0.2			2015	15.19	8,133	903	4,000	0.08%
						2029	9.83	21,234	408	12,300	0.25%
						2043	10.24	26,136	595	20,200	0.40%

NOTES:

a Plan of Development assumes 69 month (5.75 years) construction period with total water usage during construction to be 4,100 acft and 600 ac-ft/yr usage during operational phase. Construction water usage averaged over a period of five years starting in 2011 (proposed construction start is 4th quarter 2011). Year 2029 represents 14 years into operation. Year 2043 represents the end of operational life of the BSPP.

b Three wells are proposed to supply water needs during construction and four wells (up to a maximum of 10 wells) during operations. The value represents the maximum drawdown observed at any one well.

c See Appendix J of the Palo Verde Solar I AFC August 2009– Numerical Groundwater Modeling: Assessment of Impacts from a revision in the well configuration for the proposed construction water supply.

d The storage change is based on a recoverable storage of 5,000,000 acre-feet as reported by the DWR (2004)

SOURCE: Derived from AECOM, 2010.

administration buildings, the solar field, and other facilities as discussed previously. Construction of these facilities would involve the use of bulldozers, graders, semi-trucks, and various other heavy machinery, and would involve changes to on site topography. These activities would potentially loosen existing surface soils and sediments, increasing the potential for erosion during storm events. Additionally, the use of construction equipment may involve the accidental release of fuel, oils, brake dust, lubricants, antifreeze, HTF, and other potentially hazardous substances at the construction site. These water quality pollutants could become entrained in surface water during storm events, and/or be infiltrated into groundwater and the underlying aquifer, resulting in the degradation of water quality. However, compliance with the requirements of an NPDES General Permit for Construction Activities would be required during BSPP construction, and would include implementation of best management practices (BMPs) and other measures for retaining or otherwise minimizing the release of potential water quality pollutants.

Groundwater Quality

There is a potential that significant groundwater quality impacts could occur during construction if contaminated or hazardous materials used during construction were to be released and migrate to the groundwater table. However, given proposed implementation of a hazardous material management plan during construction, along with adherence to the conditions of an NPDES General Permit for Construction Activities (see above), the potential for such impacts to groundwater quality appears low.

Operation

Surface Water Hydrology

The impacts of the BSPP on the local surface water hydrology would be directly related to proposed onsite grading and the construction and operation of a network of engineered collector/conveyance channels. These channels would be designed for the purpose of protecting the BSPP from flooding and erosion related to the conveyance of runoff from watersheds outside the BSPP. Onsite runoff would be controlled through appropriate grading and a network of engineered channels designed to collect and convey flow through the BSPP for discharge to one of the larger peripheral channels, which ultimately would discharge offsite. The BSPP would change both the extent and physical characteristics of the existing floodplain within the BSPP site and downstream of the BSPP site, as well as change the sediment transport and depositional characteristics of the BSPP site.

The Project Drainage Report (AECOM, 2010a) provides a summary of discharges at the downstream property boundary, which compares existing total outflows with post-development outflows at the BSPP boundary. There is a large disparity reported between the two conditions as summarized in Table 4.19-2. The differences between the pre- and post-development peak discharges appear too great to be accounted for by changes in on-site flow conditions. In addition, the total runoff volumes reported in the Drainage Report for pre- and post-development conditions do not seem to be well-correlated. Detailed explanation and documentation of this disparity has not been provided in the Project Drainage Report (AECOM, 2010a). Additionally,

TABLE 4.19-2
SUMMARY OF EXISTING AND PROPOSED PEAK FLOW RATES AT DOWNSTREAM BSPP BOUNDARY

Channel ID	Existing Flowrate at Outlet of Site (cfs)			Proposed Flowrate at Outlet of Site (cfs)		
	Q_{10}	Q_{25}	Q_{100}	Q_{10}	Q_{25}	Q_{100}
North	2,269	3,487	5,665	1,431	2,458	4,547
Central	1,960	3,257	5,661	60	118	973
West	2,076	3,190	5,192	1,165	1,823	2,049
Southeast	136	251	503	121	219	1,147
South	93	184	398	229	392	706

SOURCE: CEC RSA June 2010Soil and Water Table 18

figures clearly documenting the HEC-HMS analysis were not provided in the drainage report and digital HEC-HMS input files were not provided as requested in the BSPP data request. As a result, it is presumed that the existing Drainage Report is insufficient for final design. Discussion of additional requirements for a revised and updated drainage report is included below. The magnitude of the combined onsite and rerouted offsite discharges exiting the downstream property boundary would have a direct impact on the adequacy of the proposed drainage design to prevent erosion at the points of discharge.

Engineered drainage channels would be constructed along the BSPP boundary wherever the potential for the interception of offsite surface flows exists. These channels would intercept offsite flows and convey them around and through the BSPP for discharge at four discreet locations along the downstream BSPP boundary. Onsite flows would be discharged into these channels at discreet locations. Discharge of flow along the downstream BSPP boundary would be through the use of what the preliminary Grading and Drainage Plans for the BSPP refer to as “end diffuser” structures. The intent of these structures would be to reduce flow velocities and allow flow to spread out in a manner that mimics existing sheet flow conditions downstream of the BSPP.

Releasing flow back to native ground in a manner similar to existing conditions would be of concern for two primary reasons. The first is that flow collected from a large area and discharged in a more concentrated area could result in the potential for increased erosion. The second potential concern is that the significant change in flow patterns could essentially “dry-up” discreet areas downstream of the BSPP and, thereby, could affect existing biological resources beyond the BSPP boundary.

During decommissioning, the BSPP site would be restored to its existing condition. Flood control structures surrounding the site would be removed, and on site drainage facilities would be removed. The site would be graded so as to be as consistent as possible with adjacent natural drainage areas. Washes and channels that currently exist on site would not be restored precisely to their current shapes and locations, but would be allowed to naturally re-form following completion of the decommissioning process.

Onsite Drainage

All existing washes and floodplains within the BSPP boundary would be completely eliminated by the grading of approximately 7,000 acres to provide flat, uniform and vegetation-free topography required for the construction and operation of the solar mirror array. The existing natural drainage system would be replaced with a system of constructed swales and channels designed to collect and convey onsite flows to designated points of discharge from the BSPP. Onsite stormwater from the BSPP would be discharged directly offsite without the use of detention basins or any other means to capture, control, or retain onsite flows. The BSPP site would contain areas of compacted soils (access roads), pavement, mirrors, and other surfaces that would be impervious or would have reduced infiltration capacity as compared to undisturbed native soils. Therefore, it is expected that implementation of the BSPP could result in a net increase in the generation of stormwater flows on site. These flows would be discharged from the site during storm events into the peripheral flood control channels, possibly resulting in an increase in water downstream during major storm events.

As noted previously, it is presumed that the existing Drainage Report is insufficient for final design. The existing Drainage Report indicates reduced flows following BSPP construction, but does not disclose methodology, and does not indicate how directly discharging water from the BSPP site could result in a reduction in flows during a storm event. Therefore, additional revisions to the drainage report and associated documentation have been required as mitigation.

Along the transmission line corridor, there would likely be localized grading at the drainages that cross the transmission line corridor alignment to allow vehicular access during construction and operation of the facility. Localized grading along linear facilities could impact offsite portions of the existing drainages if not properly stabilized. Diversion and/or channelization of existing drainages should not occur along this corridor.

Offsite Drainage

The BSPP does not include any plans for alteration of the existing natural drainage system upstream of the BSPP boundary - there are no plans for any diversions, basins, dams or other surface water controls beyond the upstream limits of the BSPP. However, there is potential for erosion upstream of the BSPP due to the formation of headcuts, which could migrate laterally from the engineered channels if they are not stabilized and protected. Headcuts could result from improperly designed or maintained drainage facilities which, during a substantial storm event, could result in substantial erosion lateral to the improperly stabilized facility.

At the BSPP site, existing drainages would be routed around or across the BSPP site, along channelized floodways that would convey stormwater and flood waters across or around the BSPP site, and release those waters along the downstream edge of the BSPP site. Thus, natural flows would be concentrated into channels on the upstream side of the BSPP, conveyed across or around the BSPP in engineered channels, and released downstream of the BSPP along an engineered diffuser structure. Physical modifications downstream of the engineered diffuser structures are not proposed.

However, there would be changes to both the existing drainage patterns and sediment transport characteristics as the result of the upstream diversion of flows and the subsequent release of those flows at discreet locations on the downstream side of the BSPP. Additionally, potentially increased discharges from on the BSPP site (as discussed above, due to a net increase in on site impervious surfaces) could also result in increased stormwater flows being released to downstream areas. Certain downstream areas would receive more flow than under existing conditions, while other areas may no longer receive any surface flow beyond what may be the result of direct precipitation. The concentration of flows at the proposed diffuser structures could increase erosion up to half a mile downslope of those locations, based on erosion patterns downstream of I-10 bridges and culverts in the area.

The assessment of the impacts to the existing surface flow patterns requires a detailed analysis utilizing FLO-2D or a similar model to clearly delineate the pre- and post-BSPP conditions. The Applicant has provided the graphical results of a pre-development FLO-2D analysis, as well as a Technical Memorandum for the post-development FLO-2D analysis. The methodology and results of these analyses were sufficient to allow for assessment of the order and magnitude of potential drainage and flood related impacts. However, the methodology and results of these analyses were not well documented, and as presented, did not allow for a thorough, fine scale review of the changes in existing flow characteristics downstream of the BSPP. Therefore, an updated FLO-2D analysis needs to be prepared as identified under mitigation measure WATER-11.

Flood Hazards

The BSPP would be protected from flooding from offsite sources through the construction of engineered channels along upstream BSPP boundaries. These channels would capture and convey up to the 100-year flow through and around the BSPP and discharge it at four discreet locations on the downstream (east) BSPP boundary. The Drainage Report (AECOM, 2010a) and Preliminary Grading and Drainage Plans (AECOM, 2010a) for the BSPP provide information on the design and performance of the proposed collector and conveyance channels, including preliminary plan and profile layout and hydraulic analysis using the HEC-RAS computer program. In general, the preliminary plans were incomplete and inconsistent between the plan view, profiles, and typical sections. The plans as provided did not present a fully developed conceptual drainage design based on site specific conditions. Of particular concern were the channel profiles and typical sections which did not adequately reflect how the engineered collector channels would tie into existing grade. Therefore, Mitigation Measure WATER-10 would be required, which would require completion and adherence to a revised and updated drainage report.

A summary of the proposed channel geometry and hydraulic characteristics as provided in the preliminary Grading and Drainage Plans and Drainage Report (AECOM, 2010a) is provided in Table 4.19-3 below. The data provided indicate that portions of several of the channels do not meet established guidelines for allowable channel velocities and Froude number, which may result in erosion of unprotected banks due to a critical (turbulent) flow regime along discreet channel reaches.

TABLE 4.19-3
SUMMARY OF COLLECTOR AND CONVEYANCE CHANNEL HYDRAULIC CHARACTERISTICS

Channel ID	Length (ft)	Bottom Width (ft)	Channel Depth (ft)	Side Slopes (H:V)	10-Year Velocity Range (ft/s)	10-Year Froude No.
North	29,256	100-150	3' to 21'	3:1	0.3 to 11.4	0.1 to 2.5
Central	22,780	50	3' to 23'	3:1	0.1 to 1.5	0.1 to 1.1
West	26,885	170	5' to 15'	3:1	1.5 to 9.2	0.2 to 2.0
Southeast	9,310	40	5' to 10'	3:1	1.5 to 2.4	0.3 to 0.4
South	5,436	30	10' to 20'	3:1	2.0 to 7.4	0.2 to 1.4

* Does not include velocity and Froude numbers at the proposed drop structures which are not representative of general channel conditions.

SOURCE: CEC RSA June 2010Soil and Water Table 19.

Protection of the facility from flooding and erosion related to onsite runoff would be accomplished through appropriate grading and the construction of engineered swales and channels. The preliminary Grading and Drainage Plans (AECOM, 2010a) indicate finished grades within the solar array ranging from 0.4-1.0 percent.

The relatively flat slopes and grading would prevent runoff from concentrating, resulting in shallow sheet flow that would minimize the potential for surface erosion and sediment transport. Drainage swales would be placed approximately every 289 feet to collect the onsite flows. These swales would be constructed at a slope of approximately 0.10 percent, which should result in non-erosive velocities. Swales would discharge into onsite collector channels, which subsequently would discharge into the major channels on the periphery of the BSPP that disperse flow back to the existing ground. The preliminary Drainage Report provided hydraulic analysis for the onsite collector channels that indicated 100-year flow velocities below 5.0 feet per second (ft/s) would occur in all channels—and in most cases would be significantly lower, indicating that flows would be non-erosive in a 100-year design event. A conceptual onsite post-development drainage plan was provided in the preliminary Drainage Report (AECOM, 2010a).

During operation, the proposed collector and conveyance channels around the periphery of the BSPP would be exposed to incoming side flows along much of their extents. This would be of most significance concern along the North, West and South channels. These inflows would include concentrated runoff at the more defined drainages, shallow sheet flow across much of the BSPP boundary, and smaller localized flows. All of these elements would have the ability to cause significant erosion of unprotected channel banks as well as create headcutting, which would extend roughly perpendicular from the outer channel bank into the adjacent floodplain. These headcut features could achieve the same depth as the main collector channel and could extend upstream for several hundred feet over time due to numerous smaller flow events, or could occur very quickly from a single large event depending on the magnitude of flow at a given location.

Impacts to areas beyond the BSPP boundaries could occur due to these erosional features. Appropriate bank stabilization measures would need to be implemented to ensure that headcutting

is prevented at all locations where flow enters the engineered channels. The preliminary Grading and Drainage Plans (AECOM, 2010a) for the BSPP do not provide any provisions for the protection of the collector channel banks from incoming flows and potential erosion. The Project Drainage Report (AECOM, 2010a) refers to protection of the outside bank on the North Channel but does not provide specifics or address the West and South channels, which would actually collect most of the offsite flows.

Along portions of the North Channel, flow appears to occur in a direction primarily parallel to the channel alignment. Full lining of the north bank with soil cement or other approved method may not be required along this reach as it would be if flow is more perpendicular to the channel. It could be acceptable along this reach to discharge into the North Channel at discrete locations, with the remainder of the north bank remaining earthen. This approach would require the use of compacted earthen berms located parallel to the North Channel to guide flow to discrete and stabilized openings and spillways. Preliminary analysis indicates that the use of berms and spillways would adequately mitigate potential erosion impacts. However, this preliminary investigation needs to be supported by a FLO-2D analysis during final design that demonstrates flow patterns, peak discharges and flow velocities are appropriate for the use of earthen berms. Armoring of the outside of the berms could be required to ensure stability.

Operation of the proposed offsite and onsite channels would require significant inspection and maintenance over the life of the facility to ensure that the channels are operating as intended and that potential and observed erosion issues are addressed promptly to minimize damage to the facility and areas beyond the BSPP boundary. Relatively small problems and erosional features which develop during smaller more frequent events could become the focal point for problems during larger events. The Applicant has prepared a Draft Channel Maintenance Plan, which addresses some of the potential issues associated with long term operation of the channels. However, the plan does not adequately address the issue of the collection of offsite flows or the use of soil cement along areas subject to inflows from offsite watersheds. The document also references the use of riprap for erosion mitigation; however, riprap would not be allowed on the BSPP site due to its incompatibility with biological resources in the area.

Channel Maintenance Program

The Applicant shall develop and implement a Channel Maintenance Program that provides long term guidance to implement routine channel maintenance projects in a feasible and environmentally-sensitive manner. The Channel Maintenance Program would be a process and policy document prepared by the Applicant and reviewed by the Compliance Project Manager (CPM). The main goals of the Channel Maintenance Program would be to maintain the diversion channels to meet their original design intent to provide onsite and offsite flood protection, support the BSPP mitigation, and maintain groundwater recharge.

Surface Water and Groundwater Quality

Potential threats to surface water and groundwater quality related to operations include: potential accidental releases from the evaporation ponds that include auxiliary equipment cooling

blowdown and RO reject water, accidental releases of HTF from treatment areas, leaching of treated wastewater from the proposed septic fields, potential increases in sediment loads to adjacent washes; and accidental spills of hydrocarbon fuels and greases (including HTF fluid) associated with operations equipment.

Each 250 MW unit would have two evaporation ponds, which would be double-lined to protect against leaks, which could otherwise affect groundwater quality. Each pond would have a minimum evaporative surface area of 3.5 acres resulting in a total of seven acres of evaporation ponds for each unit or a total of 28 acres of ponds for the entire BSPP.

The ponds would be designed and permitted as Class II Surface Impoundments in accordance with CRBWQCB 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 that a pond needs to be taken out of service for some reason (*e.g.*, needed maintenance). Each pond would have enough surface area so that the evaporation rate would exceed the input rate at maximum design conditions and annual average conditions. However, this proposed design may not sufficiently account for storm events, which would result in additional water entering the ponds via rainfall. Therefore, BLM would require implementation of an additional mitigation measure, measure WATER-18, which would require that the evaporation ponds be sized to accommodate project flows plus a 25-year storm event, with at least 1 foot of freeboard. Implementation of this mitigation measure would minimize risk of spillage of water from the evaporation ponds onto adjacent areas during major storm events.

The pond liner system would consist of a 60-mil high-density polyethylene (HDPE) primary liner and a secondary 40-mil HDPE liner. Between the liners would be a synthetic drainage geonet and collection piping to be used as part of the leachate detection system (LDS), which would be directed back to the pond. There would be a hard surface protective layer on top of the 60 mil HPDE that would consist of a hard surface such as roller-compacted concrete. The hard surface would provide protection against accidental damage to the HDPE from falling objects, varying climatic conditions, and worker activities during cleanout and maintenance. Monitoring of the evaporation ponds would be required to detect the presence of liquid and/or constituents of concern. It is expected the constituents of concern for this monitoring would include chloride, sodium, sulfate, TDS, biphenyl, boron, diphenyl oxide, fluoride, potassium, selenium, and phosphate. Due to the aforementioned construction and operational procedures of the surface impoundments, combined with the groundwater monitoring prescribed under Mitigation Measure WATER-16, groundwater quality is not anticipated to be affected as a result of disposal of this waste stream.

The average pond depth would be five feet and residual precipitated solids would be removed at the end of operations (approximately 30 years) or as needed to maintain function of the evaporation ponds. The precipitated solids would be sampled and analyzed to meet the characterization requirements of the receiving disposal facility. The characteristics of the precipitated solids would determine the transportation and disposal methodology. It is anticipated the pond solids and other non-hazardous wastes would be classified as Class II Designated Waste,

a non-hazardous industrial waste. The Applicant would test the pond solids using appropriate test methods in advance of removal from the evaporation ponds to confirm this determination. A total estimated amount of solids accumulated is 23,000 tons over 30 years.

The Land Treatment Unit (LTU) would be located on the BSPP site near the power blocks and associated facilities. The material that would be placed in the LTU would consist of soil contaminated with Therminol® VP1 HTF as a result of minor leaks or spills occurring during the course of daily operational or maintenance activities. At ambient temperatures, HTF is a highly viscous material that is virtually insoluble in water. Therefore, operation of an LTU is not expected to impact surface water downslope or groundwater quality beneath the site. The LTU would be surrounded on all four sides by berms that would protect the LTU from upslope 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 constructed with a two-foot-thick clay layer on the floor (underlain by three-feet of native soil that has been compacted to 95 percent compaction) that would serve as a protective barrier to the downward movement of contaminants from the LTU. Moreover, should any contaminants escape the LTU, the water table is approximately 195 feet beneath the LTU. In summary, because of the viscosity of HTF at ambient temperatures, the low solubility of HTF, the depth of the water table, and the placement of protective berms around the LTUs, it is expected that surface water and groundwater quality beneath the site would not be impacted by LTU operation. The LTU would be operated under the requirements of 23 CCR Division 3, Chapter 15; 27 CCR 2000 et seq.; and 23 CCR 2510 et seq.

The use and application of septic fields is a long established practice as a method of wastewater treatment. The closest septic field to the privately owned parcel of land is in excess of one-half mile from the parcel. The septic systems would have no affect on the surface water in or around the BSPP site. The septic systems would be installed approximately five to six feet deep. These types of systems result in wastewater constituents being non-detectable within three feet of the bottom of the leach field. In addition, the Riverside County Department of Environmental Health has a Technical Guidance manual for Onsite Wastewater Treatment Systems, which requires a setback of 100 feet between this type of system and the nearest groundwater well. There is no groundwater well within this distance, and the nearest property is in excess of 0.5 mile away.

Individual septic systems and leach fields are planned for each of the four power blocks and the BSPP's maintenance facility for a total of five septic systems and leach fields. The septic systems and leach fields for the maintenance facility and Solar Units #1 and #4 (the northeastern and southeastern power blocks of the BSPP) would be hydraulically cross gradient from the southernmost privately owned parcel. Therefore, operation of the septic systems and leach fields from these three areas is not expected to impact surface and groundwater quality at the privately-owned parcel where (according to USGS topographic map), a well may exist (this well was not listed on USGS or DWR databases of wells).

In contrast, Solar Units #2 and #3 (the northwestern and southwestern power blocks) would be located hydraulically up-gradient from the privately-owned parcel. The leach field at Solar Unit #3 would be the closest leach field to the privately-owned parcel. The time it would take for effluent from the leach field to infiltrate through the soil to the water table below can be estimated using the vertical permeability of the soil (at Solar Unit #3) that was measured as part of the geotechnical investigation of BSPP site soils (Kleinfelder 2009).

The septic system and leach fields for the BSPP would be constructed in accordance with the requirements of Riverside County:

1. Ordinance 650.5 (the Riverside County that amends Ordinance 650 that regulates the discharge of sewage in unincorporated areas of the County of Riverside and incorporates by reference Ordinance 725);

2. Title 15 Section 15.24.010 (the Uniform Plumbing Code) Appendix K for Private Sewage Disposal – General and Disposal Fields; and

3. Title 8 Section 8.124.030 (Approval and Construction Permit for Sewage Discharge) and Section 8.124.050 (Operation Permit for Sewage Disposal).

Table 4.19-4 below lists septic system and leach field minimum setbacks as required by the County of Riverside and the setbacks for the BSPP site.

TABLE 4.19-4
SANITARY FACILITY SET-BACKS REQUIREMENTS

County of Riverside Requirement	Minimum Set Back	BSPP Set Back	Reference
Minimum Distance Between Groundwater and Leach Lines	5 feet	175 feet	Riverside County Ordinance 650.5 (& OWTS Guidance Manual)
Minimum Horizontal Distance From Water Supply Wells	50 feet	250 feet	2007 California Plumbing Code (adopted by Reference as Riverside County Title 15, Chapter 15)

SOURCE: AECOM, 2010.

The Applicant proposes to implement operation period BMPs for managing potentially harmful stormwater to protect water quality. Water quality impacts could occur during operations if contaminated or hazardous materials (oils, greases, fuels, HTF, etc.) used during operations were to contact stormwater and drain offsite. The BSPP would alter natural stormwater drainages and use BMPs to reduce potentially significant impacts related to concentrated drainage and ensuing soil erosion and sediment transport offsite. A Drainage Erosion and Sedimentation Control Plan would be required prior to onsite operations and would reduce the potential for increased sediment loads. Potential spills would be managed through hazardous materials management.

Alternatives

Reconfigured Alternative

Soil Erosion

Soil erosion at the Reconfigured Alternative site could be impacted as a result of the construction and operation of the Reconfigured Alternative. Impacts related to implementation of mitigation measures to minimize soil erosion from wind and surface water are anticipated to be similar to those associated with the BSPP. Reconfigured Alternative construction activities would disturb site soils at the site and along the linear facilities route(s). It is at the time of this disturbance that there would be the highest potential for erosion, as well as associated effects including soil loss and increased sediment yields downstream from disturbed areas.

Groundwater Basin Balance

Groundwater basin storage in the vicinity of the Reconfigured Alternative site could be impacted as a result of the construction and operational water use. The potential impact would be similar to that of the proposed BSPP.

Groundwater Levels

Groundwater levels in the vicinity of the Reconfigured Alternative site could be impacted as a result of the construction and operational water use. The potential impact would be similar to that of the proposed BSPP.

Groundwater Quality

Groundwater quality in the vicinity of the Reconfigured Alternative site could be impacted as a result of the operation of the LTU and septic fields. The potential impact would be similar to that of the proposed BSPP.

Surface Water Hydrology

The impacts and mitigation measures of the Reconfigured Alternative would be similar to the proposed BSPP, except that flow from a significantly larger watershed would need to be collected and conveyed around the Reconfigured Alternative site. All existing washes within the smaller developed portion of the site would be eliminated by onsite grading and replaced with a system of engineered swales and channels. Mitigation of potential channel erosion and headcutting would still be required. The changes to the floodplain downstream of the site resulting from the Reconfigured Alternative would impact a larger area due to the shifting of Unit 3 to the south.

Surface Water Quality

Surface water quality in the vicinity of the Reconfigured Alternative site could be impacted as a result of surface grading. In addition, potentially significant water quality impacts could occur during operations if contaminated or hazardous materials used during operations were to contact stormwater and drain offsite. Moreover, the Reconfigured Alternative would alter a larger number of natural stormwater drainages than in the proposed action, and would impact surface water quality accordingly.

Reduced Acreage Alternative

Soil Erosion

Soil erosion could be impacted as a result of the construction and operation of the BSPP. Impacts related to implementation of mitigation measures would minimize soil erosion from wind and surface water. As a result, soil erosion impacts under this alternative are anticipated to be similar to but somewhat less than those associated with the proposed action.

Groundwater Basin Balance

Groundwater basin storage in the vicinity of the BSPP site could be impacted as a result of the construction and operational water use. The potential impact would be approximately 25 percent less than in the proposed action, since this alternative would use approximately 25 percent less water than the proposed action.

Groundwater Levels

Groundwater levels in the vicinity of the BSPP site would be impacted as a result of construction and operational water use. The potential impact is expected to be approximately 25 percent less than the proposed action, as this alternative would use approximately 25 percent less water than the proposed action.

Groundwater Quality

Groundwater quality in the vicinity of the BSPP site could be impacted as a result of the operation of the LTU and septic fields. The potential impact would be similar to, though somewhat less than, that of the proposed BSPP.

Surface Water Hydrology

The impacts and mitigation measures of this alternative would be similar to the proposed BSPP, except proportionately smaller in scale with regards to overall natural area lost to mass grading. All existing washes within the smaller developed portion of the site would be eliminated by onsite grading and replaced with a system of engineered swales and channels. Mitigation of potential channel erosion and headcutting would still be required and the volume of offsite flow that would need to be collected and conveyed around the BSPP would be essentially the same due to fact that Units 1, 2,and 3 would remain in place. The changes to the floodplain downstream of the reduced acreage alternative would be essentially the same as for the proposed action.

Surface Water Quality

Surface water quality in the vicinity of the BSPP site could be impacted as a result of surface grading. In addition, water quality impacts could occur during operations if contaminated or hazardous materials used during operations were to contact stormwater and drain offsite. Moreover, the BSPP would alter natural stormwater drainages and significantly impact surface water quality. Impacts for this Alternative are anticipated to be similar to those for the proposed action.

No Action Alternative A

Because there would be no amendment to the CDCA Plan and no solar project approved for the site under this alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site. As a result, the impacts to soils and water from the construction and operation of the proposed BSPP would not occur. However, the land on which the BSPP is proposed would become available to other uses that are consistent with BLM's land use plan, including another solar project requiring a land use plan amendment. In addition, in the absence of this BSPP, other renewable energy projects may be constructed to meet State and Federal mandates, and those projects would have similar impacts in other locations.

No Action Alternative B

Because the CDCA Plan would be amended to make the area unavailable for future solar development, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site and no soil erosion impacts or impacts to jurisdictional waters. As a result, this No Action Alternative would not result in the impacts to soils and water under the proposed action. However, in the absence of this BSPP, other renewable energy projects could be constructed to meet State and Federal mandates, and would have similar impacts in other locations.

No Action Alternative C

Because the CDCA Plan would be amended, it is possible that the site would be developed with the same or a different solar technology. As a result, impacts to soils and waters would result from the construction and operation of the solar technology and resulting ground disturbance, and would likely be similar to the impacts to soils and waters from the proposed action--including groundwater extraction, erosion impacts, and impacts to jurisdictional waters. Different solar technologies require different amounts of grading; however, it is expected that all solar technologies would require grading and maintenance. As such, this No Action Alternative could result in impacts to soils and waters similar to the impacts of the proposed action.

4.19.3 Discussion of Cumulative Impacts

Impacts resulting from construction, operation, maintenance and decommissioning of the BSPP could result in a cumulative effect on water resources with other past, present, or reasonably foreseeable future actions. The geographic scope of the cumulative effects analysis for water resources consists of the PVMGB and the PVVGB. Potential cumulative effects on water resources could occur at any point during the lifespan of the proposed BSPP's lifespan, i.e., from the initiation of construction through and including completion of decommissioning activities.

Water usage rates that comprise the cumulative scenario are identified in Table 4.19-5. The cumulative scenario includes the proposed Genesis Solar Energy Project, even though it primarily overlies the Chuckwalla Groundwater Basin, because it appears that pumping associated with the Genesis project could reduce groundwater inflow to the PVMGB by between 71 ac-ft/yr and 320 ac-ft/yr as of 2043.

TABLE 4.19-5
FORESEEABLE PROJECTS AND ANTICIPATED WATER USE

Project	Proponent	BLM Serial ID	Technology	Source	Use	Water Use – Solar and Other Renewable Projects (ac-ft)							Comments
						2010	2011	2012	2013	2014	2015	2015-2043	
Palo Verde Mesa Groundwater Basin													
Big Maria Vista Solar Project	Bullfrog Green Energy, LLC	CA 49702	Photovoltaic (500MW)	Groundwater	Construction	--	8	7	7	--	--	--	No construction water use provided in POD; assume total 22 ac-ft over three years construction.
					Operation	--	--	--	--	0.22	0.22	0.22	
Blythe Airport Solar 1	US Solar	--	Photovoltaic (100MW)	Groundwater	Construction	--	1.6	1.6	--	--	--	--	No water usage given in POD. Assume water usage to be 20% of water usage for similar PV Operation
					Operation	--	--	--	0.04	0.04	0.04	0.04	
Blythe Energy Project II	Blythe Energy, LLC	--	Combined Cycle (520MW)	Groundwater	Construction	--	60	60	--	--	--	--	ACFTC (2004) indicates construction to last up to 22 months (76 acres) - no volume specified; Operational usage of 3,300 ac-ft/yr. Assume construction water usage 60 gal/cubic yard (cy). Further, assume grading encompasses entire site (76 acres) to an average depth of five feet (~620,000 cy).
					Operation	--	--	--	3,300	3,300	3,300	3,300	
Blythe PV Project	First Solar	--	Photovoltaic (7.5 MW)	Groundwater	Construction	--	0.1	0.1	--	--	--	--	Assumes 24 month construction period. No water amount specified. Given small output, assume minimal water usage for construction and operational use.
					Operation	--	--	--	0.01	0.01	0.01	0.01	
Desert Quartzite Solar Farm	First Solar (formerly OptiSolar)	CA 49377	Photovoltaic (601MW)	Groundwater	Construction	2	7	7	7	4	--	--	POD assumes construction period beginning mid-2010 with facility startup in 2013 or 2014. Assumes 27 acft total water for construction and 3.8 ac-ft/yr for operational use thereafter.
					Operation	--	--	--	--	3	3.8	3.8	
McCoy Soleil Project	enXco	CA 49490	Photo Tower (136MW)	Groundwater	Construction	--	1,000	150	75	--	--	--	POD assumes 30-month construction period with facility startup at end of 2013. Assumes water use of 1,225 ac-ft over total construction period and 600 ac-ft/yr for operational use thereafter.
					Operation	--	--	--	75	600	600	600	

TABLE 4.19-5 (Continued)
FORESEEABLE PROJECTS AND ANTICIPATED WATER USE

Project	Proponent	BLM Serial ID	Technology	Source	Use	Water Use – Solar and Other Renewable Projects (acft)							Comments
						2010	2011	2012	2013	2014	2015	2015-2043	
Palo Verde Mesa Groundwater Basin (cont.)													
Blythe Solar Power Project	Palo Verde Solar I, LLC	CA 48811	Parabolic Trough (484MW)	Groundwater	Construction	--	820	820	820	820	820	--	POD assumes 69 month (5.75 years) construction period with total water usage during construction to be 4,100 ac-ft and 600 ac-ft/yr usage during operational phase. Construction water usage averaged over a period of five years starting in 2011 (proposed construction start is 4th quarter 2011).
					Operation	--	--	--	150	300	450	600	
Total						***2***	***1,897***	***1,046***	***4,434***	***5,027***	***5,174***	***4,504***	
Chuckwalla Valley Groundwater Basin													
Genesis Solar Energy Project	Genesis Solar LLC	CACA 48880	Parabolic Trough (250MW)	Groundwater	Construction	--	1,368	616	616	--	--	--	Based on Application to Energy Commission
					Operation	--	--	--	--	1,644	1,644	1,644	

SOURCE: Derived from AECOM 2010.

Groundwater Basin Balance

Existing conditions for groundwater basin balance, including inflow and recharge from the Colorado River and adjacent groundwater basins reflect a combination of the natural condition and the effects of past actions, and are described in detail in FEIS Chapter 3.20. Briefly summarized, groundwater resources in the region supported a variety of agricultural ventures in the 1980's. As previously stated, the groundwater levels in the PVMGB have generally remained stable over recent history. The relatively stable groundwater levels that have been measured over the decades-long period of time suggest that groundwater withdrawal from the underlying aquifer has not significantly changed the water balance within the PVMGB. This is probably in large part due to recharge of groundwater from the Colorado River (AECOM, 2009). The majority of the agricultural ventures that were present in the 1980s-1990s were abandoned in the 1990's, returning groundwater resources to a balanced inflow and outflow.

It is anticipated that extraction of groundwater from the PVMGB during construction of the proposed BSPP would be approximately 4,100 ac-ft over 69 months, dropping to approximately 600 ac-ft/yr during the operation phase. Total groundwater use for the foreseeable future projects within the region is anticipated to be 17,580 ac-ft (Table 4.19-5, including the proposed BSPP) for the projected construction period of the proposed BSPP. The storage capacity of the PVMGB is approximately 5,000,000 ac-ft. The amount of cumulative groundwater extraction anticipated for construction of the proposed BSPP and the future/foreseeable projects amounts to 0.35 percent of the total stored groundwater within the PVMGB. Taken alone, the proposed BSPP would be expected to account for 0.08 percent of the total stored groundwater. These reductions in basin storage could result in locally reduced groundwater levels. However, in terms of the overall basin storage capacity, these depletion volumes are minor.

As discussed previously, groundwater flows readily across the boundary between the PVVGB and the PVMGB, and groundwater extraction in the PVMGB can result in water being drawn directly from the Colorado River and into the underlying aquifer. Therefore, the indicated reductions in groundwater in storage discussed above would likely be offset, at least partially, by increased subsurface inflow from the Colorado River into the PVVGB and the PVMGB.

When groundwater levels are reduced as a result of groundwater pumping, compaction of aquifer sediments can occur, which can result in a long term degradation in water storage capacity for the aquifer. Within the PVMGB, historic agricultural pumping drew the aquifer down substantially below its present levels, and compaction of aquifer sediments was not observed. Therefore, the PVMGB does not appear to be substantially susceptible to storage capacity loss or subsidence, and the proposed rates of groundwater extraction are not expected to result in aquifer storage capacity loss.

Extracted groundwater to support operation of the proposed BSPP and the construction and operation of the foreseeable projects defined in Table 4.19-5 is expected to approach 5,000 ac-ft/yr. Total groundwater expected to be extracted from the PVMGB over the life of all these projects would be approximately 143,000 ac-ft, or approximately 3 percent of the total estimated groundwater in storage in the PVMGB. The foreseeable projects, however, would likely induce

additional subsurface inflow from the Colorado River. As previously stated, the Colorado River Basin is fully appropriated and any groundwater production from the PVMGB will come from the mainstream of the Colorado River, the Colorado River aquifer, or tributary waters of the Colorado River. Operation of any of the foreseeable projects would have an impact on inflows to the PVVGB.

Groundwater Levels

The regional model used by AECOM (2010) is a two-dimensional superposition model developed using MODFLOW code (Harbaugh, 2000) for the Parker-Palo Verde-Cibola area, which includes the PVMGB and the BSPP site. The model employed a simple vertical geometry and a large grid spacing to evaluate the impacts from groundwater pumping on the Colorado River.

The modeling results (see Table 4.19-6) suggest that during the life of all of the foreseeable projects, groundwater level declines of five feet or more would be located at a distance of more than 22,000 feet from the BSPP site. The closest known existing well is located at a distance of 9,000 feet. Operation of all of the foreseeable projects would have an impact on groundwater levels throughout the PVMGB and the PVVGB. As discussed previously, the BSPP is not expected to result in direct effects on spring and other regional surface water features. However, operation of all of the foreseeable projects would also have an impact on springs and other surface water features.

Groundwater Quality

There is potential for cumulative groundwater quality impacts to occur during construction if contaminated or hazardous materials used during construction or operation were to be released and migrate to the groundwater table. However, as described previously for direct impacts to groundwater quality, compliance with applicable regulations, implementation of proposed BSPP elements such lined evaporation ponds, and application of the applicant proposed and prescribed mitigation (would minimize this risk. Therefore, the BSPP is expected to contribute only minimally to possible cumulative impacts related to groundwater quality.

Other projects included in the cumulative assessment would be expected to result in similar minor effects on groundwater quality, and would also be expected to implement similar mitigation measures and project design criteria as compared to the BSPP, thereby minimizing potential effects on groundwater quality. Therefore, cumulative groundwater quality impacts are anticipated to be minor, and degradation of groundwater quality from the BSPP is not expected to substantially contribute to cumulative groundwater quality reduction.

Surface Water Hydrology

The cumulative impacts of the BSPP on the local surface water hydrology would be directly related to onsite grading and the construction and operation of a network of engineered collector/conveyance channels designed for the purpose of protecting the various projects from flooding. The cumulative projects would potentially change both the extent and physical

TABLE 4.19-6
RESULTS OF NUMERICAL MODELING FOR PROPOSED BSPP AND FORESEEABLE PROJECTS

Model Scenario[a]	Objective	Zone 1		Zone 2		Year	Drawdown (feet)	Distance from Production Well to 1-foot Contour	Distance from Production Well to 5-foot Contour	Storage Change (acre-feet)	Storage Change (percent of Recoverable)[b]
		Transmis-sivity	Storativity	Transmis-sivity	Storativity						
Run 9	Cumulative impacts assessment following the projects listed on Table 4.01-1	10,000	0.2	6,300	0.2	2015	15.44	17,402	1,015	16,570	0.33%
						2029	12.37	35,745	5,845	79,253	1.59%
						2043	15.16	54,204	22,545	139,540	2.79%
Run 10	Cumulative impacts assessment following the projects listed on Water Table 19-5	28,000	0.2	26,000	0.2	2015	6.19	11,701	30	16,473	0.33%
						2029	6	58,245	60	71,606	1.43%
						2043	7.31	59,802	2,645	114,751	2.30%
Run 17	Determine relative sensitivity of the aquifer parameters and a conservative radius of influence for Zone 1 delineation	28,000	0.02	---	---	2015	7.08	42,839	95	3,123	0.06%
						2029	4.82	69,295	0	5,233	0.10%
						2043	4.91	69,295	0	6,280	0.13%
Run 18	Determine relative sensitivity of the aquifer parameters and a conservative radius of influence for Zone 1 delineation	28,000	0.2	---	---	2015	5.83	5,005	15	3,948	0.08%
						2029	3.83	7,227	0	11,503	0.23%
						2043	4.02	18,424	0	17,735	0.35%
Run 19	Determine relative sensitivity of the aquifer parameters and a conservative radius of influence for Zone 1 delineation	10,000	0.2	---	---	2015	15.19	8,133	903	3,986	0.08%
						2029	9.83	21,234	408	12,279	0.25%
						2043	10.24	26,136	595	20,227	0.40%

NOTES:
[a] The pumping schedule for the water supply well onsite and those used for the cumulative impacts analysis are provided in Water Table 21 (FEIS Section 3.21)
[b] The storage change is based on a recoverable storage of 5,000,000 acre-feet as reported by the DWR (2004)

SOURCE: AECOM, 2010.

characteristics of the existing floodplain within each project site as well as downstream of each project site, as well as change the sediment transport and depositional characteristics of each project sites. Grading/construction plans and collector/conveyance channel designs have not been finalized for any of the renewable energy projects listed. The impacts of the cumulative projects on the local surface water hydrology would be directly related to proposed operation of networks of engineered collector/conveyance channels designed for the purpose of protecting the various projects from flooding. The projects would change both the extent and physical characteristics of the existing floodplain within each project site as well as downstream of each project site, and would change the sediment transport and depositional characteristics of each of the project sites. Similarly, operation of the BSPP would result in permanent changes at the BSPP site related to stormwater runoff, including sedimentation. However, implementation of Mitigation Measures WATER-10 through WATER-14, which would be required as conditions of certification for the BSPP (see Appendix F), would ensure that flows generated on site are retained or otherwise maintained on site. Therefore, the BSPP would not cumulatively contribute to long term operational cumulative impacts associated with changes in drainage, sedimentation, or flooding/hydrology within the PVMGB, the PVVGB, or other downstream areas.

Surface Water Quality

Stormwater generated during construction or operation on the various project sites, including the BSPP, could encounter soil or chemicals that are deleterious to aquatic and terrestrial plant and wildlife. Potential water quality pollutants could include oils, greases, antifreeze, HTF, and other potential fluids and pollutants that could be accidentally released during BSPP construction and operation. It is expected that all of the projects would be required to implement BMPs for managing potentially harmful stormwater and protect water quality.

Potential water quality impacts could occur during operations if contaminated or hazardous materials used during operations were to come into contact with stormwater and drain offsite. All of the projects are expected to have Hazardous Material Management Plans to reduce this potential impact. All of the proposed projects would alter natural stormwater drainages, though the expected use of BMPs would reduce potential impacts related to concentrated drainage and ensuing soil erosion and sediment transport offsite. As discussed previously, the proposed BSPP would include similar measures for the protection of water quality. Therefore, it is not expected to measurably contribute to possible short-term or long term cumulative impacts to water quality.

Decommissioning

The decommissioning of the proposed BSPP is expected to result in impacts related to water resources similar to construction impacts. It is unlikely that the construction or decommissioning of any of the cumulative projects would occur concurrently with the decommissioning of this BSPP, because the decommissioning is not expected to occur for approximately 30-40 years. As a result, there may not be cumulative impacts on water resources during decommissioning of the proposed BSPP generated by the cumulative projects. Therefore, the BSPP is not expected to contribute to cumulative impacts related to water resources.

4.19.4 Summary of Mitigation Measures

The implementation of mitigation measures imposed by the Energy Commission as Conditions of Certification for the BSPP also would avoid or reduce impacts on the quality of the human environment. These mitigation measures are set forth in Appendix G. The following address impacts on water resources:

> WATER-1, WATER-2, WATER-3, WATER-4, WATER-5, WATER-6, WATER-7, WATER-8, WATER-9, WATER-10, WATER-11, WATER-12, WATER-13, WATER-14, WATER-15, WATER-16, and WATER-17

Additionally, BLM would require implementation of the following mitigation measure, which is in addition to the mitigation measures set forth in Appendix G:

> **BLM-WATER-18:** The proposed evaporation ponds shall be sized so as to maintain no less than one foot of freeboard during storm conditions. Specifically, the ponds shall be sized to accommodate operational discharges plus a 25-year storm event, with no less than one foot of freeboard.

4.19.5 Residual Impacts after Mitigation Measures are Implemented

Implementation of the mitigation measures identified above would address potential BSPP-related impacts on water resources. However, a small degree of residual impacts could remain even following implementation of the proposed mitigation measures. The following text reviews the efficacy of the proposed mitigation measures, and discusses potential for residual impacts, as relevant.

Colorado River Effects (WATER-1 and WATER-15): Implementation of the proposed mitigations would ensure that either (1) potential effects on the Colorado River hydrology are avoided entirely, or (2) the applicant applies for and receives an allocation of water from the Colorado River. No residual impact would occur.

Groundwater Level Mitigation (WATER-2, WATER-3, WATER-4, WATER-5, WATER-8): Implementation of these mitigation measures would ensure that wells are properly sited and installed; ensure that no more than 22,100 acre-feet of water is pumped over the BSPP lifetime; ensure implementation of a groundwater level monitoring, mitigation, and reporting plan during construction and operation; provide monetary or other reimbursement for potential impacts to wells; and provide for groundwater production reporting. These measures would ensure that potential reductions in groundwater levels are minimized. However, a relatively minor degree of residual groundwater level reduction would occur as a result of BSPP implementation, as discussed previously.

Water Quality (WATER-6, WATER-7, WATER-16, WATER-17, WATER-18): These mitigation measures ensure compliance with applicable laws and other requirements related to on-site stormwater discharges, design and operational requirements for the proposed septic

system and leach field, and drinking water standards. WATER-16 requires documentation of groundwater quality during operations. Compliance with these measures would ensure that levels of construction-related sediment loading, erosion, and other water quality pollutants would be minimized, and that potential degradation of groundwater quality associated with the proposed septic system would be minimized. Although residual surface and groundwater quality impacts are not considered significant, a very small degree of residual surface and groundwater quality reduction is expected, in comparison to the No Project Alternative, due primarily to the introduction of treated leachates from the proposed septic system.

Drainage and Flooding (WATER-10, WATER-11, WATER-12, WATER-13, WATER-14, WATER-18): These mitigation measures ensure that potential BSPP drainage and flooding related impacts would be minimized. They include completion of a revised and updated Drainage Report that would include updated analysis and considerations for climate change related updates to the current Drainage Report, an updated hydraulic analysis, compliance with Riverside County guidelines for conveyance channels, revisions to preliminary grading and drainage plans, and implementation of a channel maintenance program during BSPP operations. These mitigation measures would ensure that potential impacts related to drainage and flooding are reduced to insignificant levels. Residual effects would be minor, but could include minor fluctuations in sediment transport along washes adjacent to and downstream of the BSPP.

4.19.6 Unavoidable Adverse Impacts

As discussed previously, implementation of the BSPP and associated permit requirements and mitigation strategies would result in minor adverse impacts for the following categories: (1) surface water quality: minor reduction in water quality during construction, operation, and decommissioning; (2) groundwater quality: minor reduction in groundwater quality during construction, operation, and decommissioning; (3) groundwater level: relatively minor degree of reduction in water levels is expected during construction and operation; (4) drainage and flooding: minor changes during construction, operation, and decommissioning.

4.20 Impacts on Wildland Fire Ecology

4.20.1 Impact Assessment Methodology

Impacts of fire on the wildlands in the vicinity of the BSPP would be related to the changes to the footprint size of the proposed action. The incidence of human-vehicle-caused wildfire would be related to the numbers of vehicles accessing the site for construction, operations, and maintenance activities, as section 3.23 documents the primary causes of fire in the area are lightning and vehicles. For the No Action Alternatives, Proposed Action, Reconfigured Alternative, and Reduced Acreage Alternative, differences in fire incidence and therefore impacts in the BSPP Area would also vary by the relative ability and relative numbers of vehicles accessing the BSPP Area in the short and long term. These estimates come from Section 4.18, *Transportation and Public Access*.

4.20.2 Discussion of Direct and Indirect Impacts

Proposed Project

Direct impacts of wildfire would include mortality of plants and wildlife and loss of forage and cover. Annual plants and burrowing wildlife would be less affected in the short term because seeds in the soil and animals under the soil would not likely be consumed. Indirect impacts would result in changes to the vegetation communities and the wildlife supported by the communities. The spread of invasive plants, especially annual grasses, creates an increased potential for wildfires which can result in disastrous ecological change. Historically in the planning area, the occurrence of wildfires has been low. Repeated fires are known to decrease the perennial plant cover and to aid some invasive annual plants. In turn, where they gain widespread propagation, these invasive plants would provide fuel to carry flames, potentially resulting in larger fires in the future. Surface disturbing activities and vehicle use that promotes the introduction of invasive plants would increase the likelihood of larger fires in the future. Fires have not been common or large in the NECO planning area in the past, but could increase as the invasive, non-native grass cover increases.

Wildfires (caused by construction or downed transmission lines) are rare but the increase in daily vehicle use in the area from an anticipated 200 new jobs during operation and up to 1000 jobs during construction could increase the risk of ignition. Climate change would result in a small but general increase in temperature, and could also result in an increase in the frequency of extreme weather events that could generate wildfires, such as increased frequency of drought and heat waves, during operation and maintenance of the BSPP.

Brooks (1998) performed the most in-depth analyses of the correlations between invasive annual plants and environmental impacts. He found that, despite comprising only five percent of the annual plant species in the desert, two invasive annual grasses--red brome (*Bromus madritensis ssp. rubens*) and Mediterranean split grass (*Schismus spp.*)--and one invasive forb--fileree (*Erodium cicutarium*)--accounted for 66 percent of total plant biomass during a high rainfall year.

Biomasses of each were positively correlated with disturbances from off-highway vehicles and sheep grazing combined. He concluded that invasive annual grasses out-competed native species. Invasive annual grasses contributed greatly to fire fuels, and combustion of dry red brome produced flame lengths and temperatures sufficient to ignite perennial shrubs. He cited other literature (e.g., pp. 11-12) showing that around the world plant invasions are promoted by human disturbances. He also showed that soil nutrients played a significant role and that nitrogen deposition may enhance the rate of invasion.

Wildfire suppression efforts would result in reduced particulate (PM10) production and visibility impairment from smoke and wild-blown dust. Short term impacts from fire suppression potentially would increase levels of particulate from surface disturbance of fire fighting equipment and operations. Fire fighting efforts would use minimal ground distributing techniques such as aerial fire suppression and ground crews with hand tools. Successful fire suppression efforts minimize the number of acres burned, and result in less vegetative loss, and thereby, less wind erosion of particulate matter.

Alternatives

Although the Proposed Action, Reconfigured Alternative, and Reduced Acreage Alternative would involve different acreages and configurations, the generating capacity and construction, operations, and maintenance vehicle use would be the same between these three alternatives. Long term operations and maintenance phases of these three alternatives would tend to decrease recreation-related vehicle access to and through the BSPP Area, resulting in a reduced incidence of fire compared to No Action Alternative B.

With No Action Alternatives A and C, vehicle access to and through the BSPP Area would be similar and, therefore, fire incidence and size would be similar in the short and long term, because future solar development would not necessarily be precluded. No Action Alternative B would result in potentially greater recreation-related vehicle access in the long term as solar energy development projects would be precluded from the BSPP Area. Such vehicle access in the long term would increase along present trends and increase the incidence of vehicle-related wildfires compared to No Action Alternatives A or C.

The chance for exotic annual weeds to establish and change the fire regime in the BSPP Area would vary with the slightly different footprint size of the Proposed Action, Reconfigured Alternative, and Reduced Acreage Alternatives; 7,233 acres, 7,383 acres, and 4,750 acres, respectively.

4.20.3 Discussion of Cumulative Impacts

Incremental impacts of the BSPP could result in a cumulative effect on wildland fire risk in combination with other past, present, or reasonably foreseeable future actions. For purposes of this analysis, the geographic scope of the cumulative effects analysis for fire resources consists of eastern Riverside County, which includes about 2,800 square miles (about 1,792,000 acres). Although potential fires would not be constrained by political boundaries, the natural conditions

and existing fire response infrastructure are such that it would be reasonable to assume that a fire could be contained within this area. This boundary also is consistent with the California Department of Forestry and Fire Protection's Fire Hazard Severity Zone boundaries. (CDF 2010; CDF 2007). Potential cumulative wildfire effects could occur over the course of 40 or more years, encompassing the entire lifespan of the BSPP, from construction and operation and maintenance, through closure and decommissioning.

Existing conditions within the cumulative impacts area reflect a combination of the natural condition and the effects of past actions and are described in FEIS chapter 3. Direct and indirect effects of the BSPP are analyzed above. Past, present and reasonably foreseeable future actions making up the cumulative scenario are identified in Section 4.1. The installation and operation of transmission lines (such as the existing Devers-Palo Verde Transmission Line and lines proposed as part of the BSPP) and the use of equipment (including motor vehicles) that could spark or otherwise provide an ignition source could combine to cause or create a cumulative impact. Further, renewable energy projects that use or would use solar trough technology (such as the BSPP, Palen and the NextEra McCoy project) are expected to use heat transfer fluid (HTF) that would be heated to a high temperature (about 750 degrees Fahrenheit); management of this and other hazardous materials on site could complicate any necessary firefighting efforts. For example, in 1999, a 900,000 gallon HTF storage tank exploded at a solar power plant in the Mojave Desert, causing fire and related concerns about adjacent containers that held sulfuric acid and caustic soda. Additionally, the increased human presence and disturbance caused by the construction, operation and overall development that would occur under cumulative scenario could advance the rate of invasion by non-native vegetation and, thereby, contribute to fire fuel-loading that would burn with higher flames and hotter temperatures. Cumulative impacts would vary by alternative only to the degree to which direct and indirect impacts would vary by alternative. In this case, the incremental impact of the action alternatives is not expected to vary materially from the proposed action, because similar types of construction, operation and maintenance and closure and decommissioning activities would occur. However, to the extent that development of the site for utility-scale power generation would preclude some OHV use, wildfire risks associated with recreational uses would diminish. Solar energy development of the site also could occur under No Action Alternative B; therefore, the incremental impact of this alternative is not expected to be materially different than the proposed action. For No Action Alternatives A and C, wildfire risks would continue to be associated with OHV and other recreational use of the area.

4.20.4 Summary of Mitigation Measures

No additional mitigation measures would be needed because fire protection, vegetation treatment and weed management plans are incorporated into the Proposed Action, Reconfigured Alternative, and Reduced Acreage Alternative. The Applicant would be required install a fire protection/control system on site in including a fire water supply system and associated infrastructure, and to comply with State and Federal regulations regarding worker safety and training. Additionally, under Mitigation Measure WORKER SAFETY-7, the Applicant would be required to provide funding to the Riverside County Fire Department to ensure available

resources to fight potential fires on site. Although the risk of wildfire that could affect the BSPP could increase as a result of climate change, these potential increases in risk are expected to be offset by ongoing compliance with the worker safety and fire protection regulations and mitigation measures. Mitigation Measures BIO-6, 7, 8, 14 (a weed management plan), 19, and 23, which reduce exotic weeds, would reduce the incidence and size of wildfires and would tend to maintain the natural vegetation communities.

4.20.5 Residual Impacts after Mitigation Measures were Implemented

Despite the Fire and Weed Control Programs that would be incorporated into any of the Action alternatives, the changes in vehicle use accessing the area for construction, operation, and maintenance and recreational vehicle access would increase the likelihood of wildfires in the BSPP Area to a slight, but unknown degree.

4.20.6 Unavoidable Adverse Impacts

The residual impacts described above would be unavoidable consequences of development.

4.21 Impacts on Wildlife Resources

4.21.1 Impact Assessment Methodology

This analysis is based, in part, upon information from the following sources: the Application for Certification (AFC) (Solar Millennium 2009a) and Supplement to the AFC (Solar Millennium 2009b); responses to CEC staff data requests (AECOM 2010a); CEC staff workshops held on December 9 and 18, 2009, January 7, 10, 14 and 25, 2010, and April 28, 2010; site visits by CEC staff on October 7, 2009, November 3, 2009 and January 25, 2010; communications with representatives from the California Department of Fish and Game (CDFG), the Bureau of Land Management (BLM), and the U.S. Fish and Wildlife Service (USFWS); and information contained within the Northern and Eastern Colorado Desert Coordinated Management Plan (NECO). Additionally, new information was obtained between the SA/DEIS publication and development of the PA/FEIS. This information primarily relates to Nelson's bighorn sheep, western burrowing owl, and golden eagles (AECOM 2010v, AECOM 2010w, and AECOM 2010x); this information does not affect any of the conclusions made in the PA/FEIS. The BLM was integrally involved in the preparation of this analysis with the CEC and other natural resource agencies.

This section analyzes potential impacts to wildlife resources from the construction and operation of the BSPP. This analysis addresses potential impacts of the BSPP (including ancillary facilities) to special-status wildlife species and other significant wildlife resources. Direct, indirect, and cumulative impacts are analyzed and quantified, if possible. See Appendix H for a more detailed cumulative analysis.

Direct impacts are those resulting from the BSPP and occur at the same time and place. Indirect impacts are caused by the BSPP, but can occur later in time or farther removed in distance while still reasonably foreseeable and related to the proposed action. The potential impacts discussed in this analysis are those most likely to be associated with construction and operation of the BSPP.

Impact analyses typically characterize effects to plant communities as temporary or permanent, with a permanent impact referring to areas that are paved or otherwise precluded from restoration to a pre-BSPP state. In the desert ecosystems the definition of permanent impacts to wildlife habitat needs to reflect the slow recovery rates of its plant communities. Natural recovery rates from disturbance in these systems depend on the nature and severity of the impact. For example, creosote bushes can resprout a full canopy within five years after damage from heavy vehicle traffic (Gibson et al. 2004), but more severe damage involving vegetation removal and soil disturbance can take from 50 to 300 years for partial recovery; complete ecosystem recovery could require over 3,000 years (Lovich and Bainbridge 1999). In this analysis, an impact is considered temporary only if there is evidence to indicate that pre-disturbance levels of biomass, cover, density, community structure, and soil characteristics could be achieved within five years.

4.21.2 Discussion of Direct and Indirect Impacts

Proposed Action

Desert Tortoise

Direct Impacts

The BSPP would cause permanent loss of low to moderate desert tortoise habitat acreage would occur by blading and development of the BSPP footprint. During construction of the BSPP desert tortoises could be harmed during clearing, grading, and trenching activities or could become entrapped within open trenches and pipes. Construction activities could also result in direct mortality, injury, or harassment of individuals as a result of encounters with vehicles or heavy equipment. Other direct effects could include individual tortoises being crushed or entombed in their burrows, collection or vandalism, disruption of tortoise behavior during construction or operation of facilities, disturbance by noise or vibrations from the heavy equipment, and injury or mortality from encounters with workers' or visitors' pets. Desert tortoises also could be attracted to the construction area by application of water to control dust, placing them at higher risk of injury or mortality. Increased human activity and vehicle travel would occur from the construction and improvement of access roads, which could disturb, injure, or kill individual tortoises. Also, tortoises could seek shade and thermal cover by taking shelter under parked vehicles and be killed, injured, or harassed when the vehicle is moved.

Impacts of Relocation/Translocation. Capturing, handling, and relocating desert tortoises from the proposed site after the installation of exclusion fencing could result in harassment and possibly death or injury. Tortoises could die or become injured by capture and relocation if these methods are performed improperly, particularly during extreme temperatures, or if they void their bladders. Averill-Murray (2001) determined that tortoises that voided their bladders during handling had significantly lower overall survival rates (0.81-0.88) than those that did not void (0.96). If multiple desert tortoises are handled by biologists without the use of appropriate protective measures, pathogens could be spread among the tortoises, both resident and relocated or translocated animals. For those tortoise near but not within the BSPP Disturbance Area, removal of habitat within a tortoise's home range or segregating individuals from their home range with a fence would likely result in displacement stress that could result in loss of health, exposure, increased risk of predation, increased intraspecific competition, and death. Tortoises moved outside their home ranges would likely attempt to return to the area from which they were moved, therefore making it difficult to isolate them from the potential adverse effects associated with BSPP construction.

The risks and uncertainties of translocation to desert tortoise are well recognized in the desert tortoise scientific community. The Desert Tortoise Recovery Office (DTRO) Science Advisory Committee (SAC) has made the following observation regarding desert tortoise translocations (DTRO 2009, p. 2):

> "As such, consensus (if not unanimity) exists among the SAC and other meeting participants that translocation is fraught with long-term uncertainties, notwithstanding recent research showing short-term successes, and should not be considered lightly as a

management option. When considered, translocation should be part of a strategic population augmentation program, targeted toward depleted populations in areas containing "good" habitat. The SAC recognizes that quantitative measures of habitat quality relative to desert tortoise demographics or population status currently do not exist, and a specific measure of "depleted" (e.g., ratio of dead to live tortoises in surveys of the potential translocation area) was not identified. Augmentations may also be useful to increase less depleted populations if the goal is to obtain a better demographic structure for long-term population persistence. Therefore, any translocations should be accompanied by specific monitoring or research to study the effectiveness or success of the translocation relative to changes in land use, management, or environmental condition."

Indirect Impacts

Indirect Impacts include increased risk of predation from ravens, coyotes, feral dogs; disturbance from increased noise and lighting; introduction and spread of weeds; increased road kill hazard. Development would also fragment surrounding habitat.

Ravens, Coyotes, and Other Predators. Construction and operations activities associated with the BSPP could provide food or other attractants in the form of trash, road-killed animals, and water, which would draw unnaturally high numbers of desert tortoise predators such as the common raven, kit fox, and coyote to the BSPP area. BSPP structures would also provide new nesting and perching sites for ravens, increasing their presence in the vicinity of the BSPP and eventually increasing their population. Common raven populations in some areas of the Mojave Desert have increased 1,500 percent from 1968 to 1988 in response to expanding human use of the desert (Boarman 2002). Since ravens were scarce in this area prior to 1940, the current level of raven predation on juvenile desert tortoises is considered to be an unnatural occurrence (BLM 1990, USFWS 2008a) and one of many anthropogenic contributors to desert tortoise population declines.

In addition to ravens, feral dogs have emerged as major predators of the tortoise. Dogs could range several miles into the desert and have been found digging up and killing desert tortoises (USFWS 1994; Evans 2001). Dogs brought to the BSPP site with visitors could harass, injure, or kill desert tortoises, particularly if allowed off leash to roam freely in occupied desert tortoise habitat. The worker environmental awareness training (BIO-6) and restrictions on pets being brought to the site required of all personnel (BIO-8) would reduce or eliminate the potential for these impacts.

Construction and operation of the BSPP would increase raven and coyote presence in the BSPP area. Ravens capitalize on human encroachment and expand into areas where they were previously absent or in low abundance. Ravens habituate to human activities and are subsidized by the food and water, as well as roosting and nesting resources that are introduced or augmented by human encroachment. The City of Blythe and the nearby airport provide food, water features, and roosting/nesting substrates (buildings, signs, lamps, and utility poles) that otherwise would be unavailable. This development adjacent to the proposed BSPP provides year-round water and trash subsidies for the raven as well as nesting opportunities.

Small mammal, fox, coyote, rabbit, lizard, snake, and tortoise road kill along I-10 provides an additional attractant and subsidy for opportunistic predators/scavengers such as ravens. Road kills would mount with increased BSPP construction and operations traffic, further exacerbating the raven/predator attractions and increasing desert tortoise predation levels.

Increased Risk from Roads/Traffic. Vehicle traffic would increase as a result of construction and improvement of access roads, increasing the risk of injuring or killing desert tortoise. The potential for increased traffic-related tortoise mortality is greatest along paved roads where vehicle frequency and speed is greatest though tortoises on dirt roads also could be affected depending on vehicle frequency and speed. Census data indicate that desert tortoise numbers decline as vehicle use increases and that tortoise sign increases with increased distance from roads (Nicholson 1978; Hoff and Marlow 2002). Additional unauthorized impacts that could occur from casual use of the access roads in the BSPP area include unauthorized trail creation.

Impacts from Noxious Weeds. Sahara mustard (Brassica tournefortii) is regarded as one of the most invasive wildland pest plants in the Colorado and Mojave deserts, one of the most common invasive plants in desert tortoise habitat, and capable of dominating entire desert landscapes if no control actions are taken. Left uncontrolled, it out-competes and ultimately replaces native wildflowers that provide valuable forage for the desert tortoise. It forms dense thickets that can increase the frequency, intensity, and size of desert fires, increasing the threat to native plant communities, the desert tortoise, and other wildlife (Brooks 2010 as cited in the CEC RSA June 2010). In areas where Sahara mustard is particularly dense it also could impede desert tortoise movement (Berry pers. comm. as cited in CEC RSA June 2010). In the Colorado and Mojave Deserts, a single tortoise was necropsied that had died from renal failure, related to renal oxalosis, and the crystals present in the kidneys were identified as oxalates (Jacobson et al. 2009). One additional tortoise was later necropsied that died of oxalosis in the same region (Berry pers. comm. 2010). Many native plants in the Mojave and Colorado deserts contain oxalates; however, the oxalate-containing weed Sahara mustard is one of the most common invasives in desert tortoise habitat and is a suspected cause of the renal failure (Berry pers. comm.).

Sahara mustard spreads explosively during wet years but even during a 12-year drought in Riverside County (1989-1991), the population of Sahara mustard increased by nearly 35 times. Densities equivalent to as high as three million plants per acre have been recorded at Lake Mead National Recreation Area (Graham et al. 2003 as cited in the CEC RSA June 2010).

Mojave Fringe-toed Lizard

Direct impacts to Mojave fringe-toed lizards during construction of the transmission line and associated access road would result from a permanent loss of occupied habitat, accidental disturbance to protected habitat adjacent to the BSPP site, and mortality from vehicle strikes. Indirect impacts include the introduction and spread of invasive plants; erosion and sedimentation of disturbed soils; fragmentation and degradation of remaining habitat; increased road kill hazard from operations traffic; harm from accidental spraying or drift of herbicides and dust suppression chemicals, and; an increase in access for avian predators (such as loggerhead shrikes) due to new perching structures.

Sahara mustard, in particular, is a noxious weed of high concern in the Colorado Desert. Sahara mustard could affect wildlife by altering the availability of forage plants and characteristics of their habitat structure. The Coachella Valley fringe-toed lizard (Uma inornata) is a dune-dependent species that requires fine, loose, windblown sand for survival (Zeiner et al. 1990). Barrows et al. (2009) found the Coachella Valley fringe-toed lizard to be the only animal species of five vertebrates evaluated to demonstrate a negative response to Sahara mustard abundance. Coachella Valley fringe-toed lizard abundance on weeded plots showed an increase in while lizard abundance on the control plots showed a decrease (Barrows et al 2009). This negative impact was short-lived and declined no more than a year after the mustard's dominance waned. This indicates that Sahara mustard removal would improve habitat quality for fringe-toed lizards. An indirect effect of Sahara mustard on fringe-toed lizard is that it could increase sand compaction within aeolian sand (active dune) communities (Barrows et al 2009). Over time sand compaction could lead to a change in habitat from an aeolian sand community to a stabilized sand community.

Permanent loss of occupied Mojave fringe-toed lizard habitat is considered a major impact since this habitat is declining in availability in the region. In addition, indirect impacts that degrade habitat and increase the risk of mortality are also considered major impacts to this species.

Couch's Spadefoot Toad

Direct effects to Couch's spadefoot toads could include loss of breeding habitat and direct mortality during grading or construction. Disturbance to breeding ponds, including to new ponds incidentally created during construction activities, could also impact this species. In addition, construction, maintenance, and operation traffic could result in direct mortality on BSPP area roads, particularly Black Rock Road, where the three ponds are located. Indirect impacts could result from hydrology changes that reduce flow to breeding areas. In addition, construction noise could trigger emergence when conditions are not favorable.

Three ponds potentially suitable for Couch's spadefoot toads occur within the BSPP site, and nine more ponds, also suitable, exist within a mile of the site (AECOM 2010u). This species requires aquatic habitat for breeding and upland habitat for burrowing. Because the species does not breed every year, potential breeding habitat does not necessarily need to sustain surface water for an extended period of time (minimum approximately nine days) every year. Burrowing habitat is considered any area with friable soil within the dispersal distance for this species. The dispersal distance is largely unknown, though there is one record from Mayhew (1965) of a juvenile 0.25 miles from the closest breeding pond, and other observations place them at least one mile from ponds (Dimmitt, pers. comm.). Therefore, in the absence of more conclusive information, upland Couch's spadefoot toad habitat is considered to be all areas with friable soils within 0.25 miles of a potential breeding pond. While little is known about the location and proximity of subterranean refuge sites, there is some indication that they are widely distributed and that breeding pond habitat is the limiting factor in the species distribution (Dimmitt, pers. comm.).

Without species-specific survey results and with limited occurrence information, it is difficult to assess the potential for direct and indirect impacts to Couch's spadefoot toads. However, based on

known occurrence information along I-10 to the east and west of the BSPP area (Dimmit 1977), and because the BSPP is within an area NECO mapped as Couch's spadefoot toad habitat, we conclude that the three ponds are potential breeding habitat for Couch's spadefoot toad.

Migratory Birds

The Applicant proposes to build eight 4-acre evaporation ponds, which pose a risk to waterfowl, shorebirds, and other resident or migratory birds that drink or forage at the ponds because they could be harmed by selenium or hyper-saline conditions resulting from high total-dissolved-solids concentrations in the water.

Direct impacts include permanent loss of breeding and foraging habitat, including loss of Sonoran creosote bush scrub and of desert dry wash woodland; potential loss of eggs and young; disturbance of nesting and foraging activities for populations on and near the plant site and linear facilities; degradation and fragmentation of remaining adjacent habitat from edge effects; hazards from evaporation ponds

Indirect Impacts would include increased road kill hazard from operations traffic and collision with mirrors; increased predation from ravens; disturbance from operations.

The BSPP area does not provide breeding habitat for Swainson's hawks, northern harriers, ferruginous hawks, or yellow warblers but these species could occur there during migration or in the winter. The BSPP impacts to Sonoron creosote bush scrub and desert dry wash woodland would contribute to loss of foraging habitat, cover, and roost sites for these species on their migratory or wintering grounds, but would not contribute to loss of breeding habitat. The BSPP would have more substantial adverse effects to the resident breeding birds at the site, which include loggerhead shrike, California horned lark, and black-tailed gnatcatcher among others. These species would be adversely affected by the loss of desert dry wash woodland, vegetated ephemeral swales, and Sonoran creosote bush scrub. Black-tailed gnatcatchers, loggerhead shrikes and other wash-dependent species would in particular be affected by the loss of the cover, foraging and nesting opportunities provided by the structurally diverse and relatively lush desert dry wash woodland. Dry washes contain less than 5 percent of the Sonoran Desert's area, but are estimated to support 90 percent of Sonoran Desert birdlife (CalPIF 2006).

The loss of active bird nests or young is regulated by the federal Migratory Bird Treaty Act and California Fish and Game Code section 3503, which protects active nests or eggs of California birds.

Golden Eagle

Direct and indirect impacts include loss of foraging habitat; potential disturbance to nesting golden eagles during construction if active nests occur within 1 mile of BSPP boundaries. Golden eagles can be extremely susceptible to disturbance during the breeding season (Anderson et al. 1990; USFWS 2009b), and adverse effects are possible from various human activities up to (and in some cases exceeding) one mile from a nest site (Whitfield et al. 2008). While golden eagles are known to occur in the region, there are no known active nests within 10 miles of the BSPP

site (BLM 1999) and this species was not incidentally observed during field surveys conducted for other plant and wildlife species (Solar Millennium 2009a). The 2010 surveys also found no active golden eagle nests within 10 miles of the BSPP (AECOM 2010x).

BSPP construction activities could injure or disturb golden eagles if nests were established sufficiently close to BSPP boundaries to be affected by the sights and sounds of construction. These potential impacts are unlikely, however, because suitable nesting substrate (i.e., cliff ledges, rocky outcrops, or large trees) do not occur within one mile of the proposed BSPP area. In the remote possibility golden eagles were to reoccupy the old nest three miles away, this is sufficient distance to prevent agitation behavior (displacement, avoidance, and defense) at the nest; increased vigilance behavior at the nest; or nest site abandonment. A reasonable buffer to adequately minimize potential indirect impacts from construction disturbance for the golden eagle is one mile and a range has been presented for energy projects of 0.25 to 2 miles (AECOM 2010x). Because there is no nesting habitat within at least one mile, and no existing nests (active or inactive) are present closer than three miles, no impacts are anticipated to golden eagle nesting as a result of project construction or operation activities. Due to the distance between the project boundary and the closest active territories, the project area is not expected to be used for foraging by any active golden eagle pairs. However, the BSPP may affect golden eagle foraging habitat at a regional level.

Record of Decision, Decision Record, and Notice to Proceed:

The BLM must consult with the USFWS to determine if the Service considers the proposed action likely to take eagles. If take is anticipated, further consultation with USFWS would be required to determine if an Avian Protection Plan (APP) would sufficiently minimize impacts to eagles. If the USFWS indicates that an APP is not sufficient to avoid or minimize likely take resulting from the proposed action, the BLM authorized officer would not issue a Record of Decision or Decision Record approving the project. If the applicant wishes to proceed, the applicant must then identify an alternative project design to reduce the likely take to a level that is compatible with the preservation of eagles, and receive USFWS concurrence for the revised APP. If, after coordination with the USFWS, an APP is deemed appropriate and needed to sufficiently avoid and minimize take by the proposed action, the BLM authorized officer may issue a Record of Decision or Decision Record approving the project; however, the BLM authorized officer would not issue a Notice to Proceed until the USFWS letter of concurrence for the APP is received for the project.

Western Burrowing Owl

Burrowing owls and their active burrows within the BSPP Disturbance Area could be crushed during construction activities. The potential for direct impacts to burrowing owls include the loss of nest sites, eggs, and/or young; permanent loss of breeding and foraging habitat; and disturbance of nesting and foraging activities for burrowing owl pairs within the site, buffer, or immediately surrounding area. Indirect impacts to burrowing owls during construction and operation could include increased road kill hazards, modifications to foraging and breeding activities, and loss of prey items and food sources due to a decreased number of fossorial mammals.

American Badger and Desert Kit Fox

American badgers and desert kit fox occur throughout the BSPP area, and construction activities could crush or entomb kit fox and American badger.

Direct Impacts include permanent loss of occupied habitat; fragmentation and degradation of remaining habitat, loss of foraging grounds, death or injury of American badgers by crushing with heavy equipment or entombing them within a den; increased risk of road kill hazard, harassment, or injury from construction traffic. Indirect impacts include disturbance from increased noise and lighting; introduction and spread of weeds; increased risk of road kill from operations traffic.

Construction of the BSPP could kill or injure desert kit fox by crushing with heavy equipment, or could entomb them within a den if avoidance measures are not implemented. Construction activities could also result in disturbance or harassment of individuals.

The BSPP would permanently remove foraging and denning habitat for American badgers and kit fox and would fragment and reduce the value of foraging and denning habitat adjacent to the BSPP site. This habitat loss and degradation could adversely affect American badger and kit fox populations within the NECO planning area.

Nelson's Bighorn Sheep

The intermountain valley floor within the BSPP site could serve as an important movement corridor for bighorn sheep attempting to move from one mountain range to another during seasonal migration or dispersal (AECOM 2010a). The proposed BSPP would not present a complete barrier to movement between mountain ranges as they still could disperse around the site to the west, north, and south. There would be sufficient open space in the valley floor for wildlife movement to the north of the project area and a corridor would be maintained at the base of the McCoy Mountains to the west of the site. The areas to the west and north of the site, which abut mountain ranges, would be avoided by the BSPP and would have a higher probability of being utilized based on higher quality forage. Cumulative impacts of other projects could eventually make movements much more difficult. Corridors described in the NECO (BLM CDD 2002) identify potential for bighorn sheep movement from the McCoy Mountains northeast to the Little Maria Mountains and west to the Palen Mountains. Further, the BSPP site, due to the width of the valley in which the solar facility would be located, has limited value as a movement corridor.

Extirpation of the McCoy Mountain Nelson's bighorn sheep deme (a local population of organisms of one species that actively interbreed with one another and share a distinct gene pool) does not preclude future occupancy. Repopulation in the McCoy Mountains could happen naturally or it could happen deliberately via translocation and development of new water sources. The CDFG has successfully re-established bighorn in some ranges in the past. The Applicant has indicated it believes the BSPP area has the potential to be used by bighorn sheep as seasonal foraging habitat (AECOM 2010a) and, if reestablished, bighorn sheep could use areas near the BSPP site as spring foraging habitat. The BSPP would result in the loss of 922 acres of spring foraging habitat (desert dry wash woodland, vegetated swales, and unvegetated washes), and have

a minor impact on a regional connectivity corridor for the bighorn sheep because the corridor is maintained to the west, north, and east of the BSPP.

Additional Operation Impacts to Wildlife

Nighttime Lighting and Nocturnal Collisions

Lighting plays a substantial role in collision risk because lights can attract nocturnal migrant songbirds and major bird kill events have been reported at lighted communications towers (Manville 2001) with most kills from towers higher than 300 to 500 feet (Kerlinger 2004). Many of the avian fatalities at communications towers and other tall structures have been associated with steady-burning, red incandescent L-810 lights used at communications towers that seem to attract birds (Gehring et al. 2006). Longcore et al. (2008) concluded that use of strobe or flashing lights on towers resulted in less bird aggregation, and, by extension, lower bird mortality, than use of steady-burning lights. BSPP operations would require onsite nighttime lighting for safety and security and the effects on visual condition during nighttime lighting would be moderate to high. Due to the lack of man-made structures and lack of artificial light sources in the BSPP area, the overall change in ambient lighting conditions following BSPP construction could be substantial. Night lighting close to the ground at the BSPP site could also attract bats and disturb wildlife that occurs adjacent to the BSPP site (e.g., nesting birds, foraging mammals, and flying insects). Security lighting in the BSPP power block and solar fields would operate during non-operating, non-sunlight hours, approximately 3,600 hours per year (AECOM 2010a).

The BSPP would result in the construction of four power blocks each with its own solar array field and other associated structures of varying heights. When the parabolic trough collector loop is at its lowest point of the day (trough is perpendicular to the ground) the entire structure would be 25 feet tall. The BSPP's tallest structures would be the air cooled condenser (approximately 120 feet in height) and would be located centrally within the power block. Other tall structures associated with the BSPP are heat transfer fluid heaters (80 feet in height), cooling towers (32 feet in height), take-off towers (50 feet in height) and auxiliary boilers (32 feet in height) (Solar Millennium 2009a). Additionally, the BSPP would result in the construction of a three-phase 500-kV, a bundled double circuit 230 kV gen-tie transmission line consisting of a high-voltage line with monopoles that would range in height from 90 to 145 feet, which would pose a collision and electrocution hazard to perching raptors, migrating birds, and possibly bats described in further detail in the following section. The transmission line insulators would be made of a non-refractive material and of a neutral color, and the conductors would be non-specular (i.e., their surfaces would have a dulled finish so that they do not reflect sunlight).

To reduce lighting impacts, lighting at the facility would be restricted to areas required for safety, security, and operation. Exterior lights would be hooded and lights would be directed on site so that light or glare would be minimized. Low-pressure sodium lamps and fixtures of a non-glare type would be specified. Switched lighting would be provided for areas where continuous lighting is not required for normal operation, safety, or security; this would allow these areas to remain un-illuminated (dark) most of the time and thereby minimizing the amount of lighting potentially visible off site. Structure heights and corresponding span lengths would be selected to meet

Federal Aviation Administration (FAA) requirements for the nearby Blythe Airport located to the southeast of the BSPP facility. Along parts of the north-south run of the transmission line, pole heights would be no taller than 90 feet in accordance with FAA guidelines. Bird collisions with structures would be a minor impact since the tallest BSPP structure would be120 feet tall and major nocturnally migrating bird strikes occur with structures that are from 300 to 500 feet tall.

Daytime Lighting (Glare) and Collisions

The proposed solar mirrors and heat collection elements (HCEs or receiver tubes) are sources of bright light caused from the diffuse reflection of the sun. The diffuse light and spread reflection coming off the parabolic mirror troughs from most visible angles during most hours of the day would reflect the global irradiation of the sky including clouds. This leads to a lower intensity of light with respect to the sun itself. It is estimated that the diffuse reflections could vary from 200,000 candela per square meter in the morning and afternoon to as much as 700,000 depending on scattering due to cloud patterns. For a human observer, this would be in all cases less intense then staring it to the sky and not directly at the sun (AECOM 2010a).

It is possible that the back-reflected light or light not absorbed by both the envelope and steel annulus of Heat Collecting Element (HCE) can be seen in the reflection of the parabolic mirror at certain angles above the horizon, i.e. not viewable to a human observer on the ground, but visible by birds and bats in flight. The intensity 11 feet or farther from the front of the vertex of the collector would be fully diverged direct (not diffuse) incidence luminance of the sun, but with a worst-case intensity approximately 20 percent less than the direct luminance of the sun; this would be similar to a human observer viewing a body of water from the sky (AECOM 2010a).

However, glint and glare studies of solar trough technology found that pedestrians standing within 60 feet of the perimeter fence when the mirrors rotate from the stowed position to a vertical position could see a light intensity equal or greater to levels considered safe for the human retina (URS 2008). Any wildlife on the ground at a distance of 60 feet or closer could experience similar hazards from unsafe light intensity. Slatted fencing has been required in the Visual Resources section of this analysis to mitigate the problem of bright spots on motorists.

Bird collisions with structures typically result when the structures are invisible (e.g., bare power lines or guy wires at night), deceptive (e.g., glazing and reflective glare), or confusing (e.g., light refraction or reflection from mist) (Jaroslow 1979). Collision rates generally increase in low light conditions, during inclement weather (e.g., fog, which is rare in the desert), during strong winds, and during panic flushes when birds are startled by a disturbance or are fleeing from danger.

Solar facilities present a new and relatively unresearched risk for bird collisions and other injuries. The solar collectors would be oriented in a northern-southern fashion and would track the sun’s movement across the sky focusing the sun’s rays on the parabolic trough collector and thus would not produce significant lighting impacts during the day. Bird response to glare from the proposed solar trough technology is not well understood. Although the proposed BSPP facilities are significantly shorter than 350 feet (the height above which is considered a collision danger for migrating birds), there is concern that the mirrors could appear to a bird as a no-hazard

flight area. The mirrors reflect light and take on the color of the image being reflected. When viewed from an angle near the current direction of the sun, at a distance or an elevated position, the solar field at its most reflective would mirror the sky and could appear like a lake at hours of the day when the mirrors are oriented toward the viewer (e.g., looking from the south with the sun behind the viewer on a sunny afternoon) (Solar Millennium 2009a). Diurnal birds could also be at risk of injury and fatality from burns if they flew into the reflected sunlight between parabolic troughs or landed on the collector tubes of heat transfer fluid.

The risk of such impacts is probably low, although very little research has been conducted on the risks of bird collisions at solar facilities. The only such research available is the bird fatality studies at the Solar One facility near Daggett, San Bernardino County (McCrary 1986). Results of that study indicated that much of the bird mortality consisted predominantly of collisions with mirrors, in large part resulting from increased numbers of birds attracted to the adjacent evaporation ponds and agricultural fields. For the BSPP, without such a nearby attractant bird numbers, and hence the likelihood of bird collisions would be low. The barren nature of the lands in the immediate vicinity of the mirrors would discourage bird use of the area, as would the 30-foot tall wind fence running the length of the eastern and western perimeter of each solar field.

Electrocution

Large raptors like golden eagles can be electrocuted by transmission lines when a bird's wings simultaneously contact two conductors of different phases, or a conductor and a ground. This happens most frequently when a bird attempts to perch on a structure with insufficient clearance between these elements. In addition, distribution lines that are less than 69 kV but greater than 1 kV pose an electrocution hazard for raptor species attempting to perch on the structure. Configurations less than 1 kV or greater than 69 kV typically do not present an electrocution potential, based on conductor placement and orientation (APLIC 1996). The proposed transmission lines would be 550 kV and would be fitted on top of monopole structures are expected to range in height from 90 feet to a maximum height of 145 feet and an average span length of in the range of 400 to 1,200 feet between poles (Solar Millennium 2009a). The transmission line and pole fitting would be constructed in accordance with the guidelines of Institute of Electrical and Electronics Engineers (IEEE) Guide 524 "Guide to the Installation of Overhead Transmission Line Conductors" and would also follow the Suggested Practices for Avian Protection on Power Lines (APLIC 2006). To minimize risk of electrocution, the BSPP should impose a "raptor-friendly" construction design for the transmission line with conductor wire spacing greater than the wingspans of large birds to help prevent electrocution as described in Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006 (APLIC 2006).

Evaporation Ponds

The Applicant has proposed various modifications to the BSPP (Galati & Blek 2010), including the addition of eight double-lined four-acre evaporation ponds to receive industrial waste streams that would primarily come from the BSPP's auxiliary cooling tower and boiler.

A variety of waterfowl and shorebirds could seasonally use evaporation ponds as resting, foraging, and nesting areas. Evaporation ponds in the Sonoran Desert pose several threats to wildlife. First, creation of a new water source to an area where water is scarce would attract ravens to the BSPP, potentially increasing predation rates on juvenile desert tortoise in adjacent habitat. Second, waterfowl, shorebirds, and other resident or migratory birds that drink or forage at the ponds or Couch's spadefoot toads and their eggs could be harmed by selenium or hyper-saline conditions resulting from high total-dissolved-solids concentrations (EPTC 1999; Lemly 1996; Windingstad et al. 1987). Biologists and agencies such as CDFG, and USFWS are concerned about these threats to wildlife posed by evaporation ponds.

Alternatives

Differences between alternatives are quantified, when possible, by the acreage that would be impacted for special status species in Table 4.21-1. Since indirect impacts are include effects such as fragmentation and inhibition of movement across the area, indirect effects often could be quantified as the remaining acreage in the study area for a given species minus the area of direct impacts.

4.21.3 Discussion of Cumulative Impacts

Appendix H includes an extensive analysis of cumulative impacts from other past, present, and reasonably foreseeable future actions to special status wildlife, plants, and movement corridors (Figure 56). Cumulative impacts from the BSPP are detailed below. Cumulative impacts would not vary greatly by alternative. Cumulative impacts would vary by alternative only to the degree to which direct and indirect impacts would vary by alternative.

Special-Status Wildlife

Desert Tortoise	**Cumulative Impacts**: Contributes to cumulative loss of low to moderate value desert tortoise habitat (2.7 percent to 0.1 habitat value, 3.8 percent to 0.2 habitat value, 6.1 percent to 0.3 habitat value, and 2 percent to 0.4 to 0.5 habitat value from future actions in the NECO planning area
Mojave Fringe-Toed Lizard	**Cumulative Impacts**** Contributes only nominally to the permanent loss of stabilized and partially stabilized dunes (<4 ac)
Western Burrowing Owl	**Cumulative Impacts**: Contributes 1.9 percent to cumulative loss from future actions within the NECO planning area
Golden Eagle	**Cumulative Impacts**: Contributes 1.8 percent to cumulative loss of foraging habitat from future actions within the NECO planning area
American Badger & Desert Kit Fox	**Cumulative Impacts**: Contributes 1.9 percent to cumulative loss of habitat from future actions within the NECO planning area.
Nelson's Bighorn Sheep	**Cumulative Impacts**: No impacts to WHMA or connectivity corridors
Burro Deer	**Cumulative Impacts:** Contributes 0.2 percent to cumulative loss of habitat from future actions within the NECO planning area.
Couch's spadefoot toad	**Cumulative Impacts:** Contributes 5.3 percent to cumulative loss of habitat from future actions within the NECO planning area

TABLE 4.21-1
COMPARISON OF DIRECT AND INDIRECT IMPACTS TO WILDLIFE FROM PROPOSED ACTION, RECONFIGURED ALTERNATIVE, REDUCED ACREAGE ALTERNATIVE, AND NO ACTION ALTERNATIVES[a]

Wildlife Species or Species Group	Proposed Action[b] (acres or #)		Reconfigured Alternative (acres or #)		Reduced Acreage Alternative (acres or #)		No Action A, B, C (acres or #)	
	Direct	Indirect	Direct	Indirect	Direct	Indirect	Direct	Indirect
Desert Tortoise	7,027 More habitat than other alternatives but of lower quality than Reconfigured or Reduced Acreage Alternatives	13,850	Approximately 23 percent less habitat than Proposed action but higher quality/ density than Proposed Action	Similar to Proposed Action	Approximately 40 percent less habitat than Proposed Action but higher quality/ density than	Similar to Proposed Action	0	0
Mojave fringe-toed lizard	4 acres of stabilized and partially stabilized dunes	650	Similar to Proposed Action	Similar to Proposed Action	Similar to Proposed Action	Similar to Proposed Action	0	0
Couch's spadefoot toad	3 ponds	9 other ponds	Similar to Proposed Action	Similar to Proposed Action	Similar to Proposed Action	Similar to Proposed Action	0	0
Migratory Birds	7,027 Impacts to ephemeral drainages similar to Reconfigured	13,850	Approximately 23 percent less acreage than Proposed Action. Impacts to ephemeral drainages similar to Proposed Action	Similar to Proposed Action	Approximately 40 percent less acreage than Proposed Action. Impacts to ephemeral drainages half of the Proposed Action	Similar to Proposed	0	0
Golden Eagle	7,027 Foraging habitat	13,850 Remaining foraging habitat in study area	Approximately 23 percent less acreage than Proposed Action	Similar to Proposed Action	Approximately 40 percent less acreage than Proposed Action	Similar to Proposed Action	0	0
Western Burrowing Owl	7,027	13,250	Approximately 23percent less acreage than Proposed Action	Similar to Proposed Action	Approximately 40 percent less acreage than Proposed Action and avoids best habitat	Similar to Proposed Action	0	0
Desert Kit Fox & American Badger	7,027	Similar to Proposed Action	Approximately 23 percent less acreage than Proposed Action	Similar to Proposed Action	Approximately 40 percent less acreage than Proposed Action	Similar to Proposed Action	0	0
Nelson's Bighorn Sheep	Slight impact to future use as migration corridor in future; loss of 922 acres of spring foraging habitat	Unknown	Slight impact to future use as migration corridor in future; loss of 644 acres of spring foraging habitat	Unknown	Slight impact to future use as migration corridor in future; loss of 382 acres of spring foraging habitat	Unknown	0	0
Burro Deer	550	600	Impacts to ephemeral drainages similar to Proposed Action	Similar to Proposed Action	Impacts to ephemeral drainages half of the Proposed Action	Similar to Proposed Action	0	0

[a] Acreages for the Proposed Action Disturbance Area (AECOM 2010q) have been rounded. Acreages are approximate for the alternatives. It is assumed herein, that all of the vegetation for the alternatives would be impacted. Either No Action Alternative A or C could have similar impacts to Proposed Action, Reconfigured, or Reduced Acreage in the long term if a project is approved.
[b] Does not include direct impacts from the transmission line and substation sites.

Wildlife Movement and Connectivity

Connectivity refers to the degree to which organisms can move among habitat patches and populations. Individuals must be able to move between patches to meet their resource needs, while populations must be connected to allow for dispersion, gene flow, and re-colonization. The site does not overlap with designated Areas of Critical Environmental Concern (ACECs), WHMAs, or DWMAs, nor has it been proposed by the public for designation as wilderness. In addition, the eastern portion of the BSPP site was included in the Solar Programmatic EIS recommendations for the Riverside East Solar Energy Study Areas (SESA) by the Wilderness Society and Natural Resources Defense Council because of its low potential for substantial resource conflicts, relative to other project sitings.

The cumulative effects of all proposed future actions are likely to remain substantial after mitigation, even after action-specific mitigation is considered. The substantial cumulative impact is due to the residual effects of fragmentation, impaired connectivity, degradation of the function and values of remaining habitat from predators, invasive plants, fire, and disease. Ongoing collaborative efforts by federal and state agencies to develop a Desert Renewable Energy Conservation Plan and BLM's Solar Energy Development Programmatic EIS provide an appropriate vehicle for mitigation for the substantial cumulative effects of all proposed future actions on general wildlife movement and connectivity between WHMAs and DWMAs.

This analysis utilized the NECO Plant Communities and Landforms datasets to describe the type of habitat affected within each separate WHMA. In all three WHMAs, the BSPP does not contribute to the cumulative effects of existing and future projects on habitat loss within the WHMAs, and is located well outside the WHMA boundaries. It is located approximately one to two miles southwest of the nearest WHMA—the Big Maria Mountains WHMA—between the WHMA and the Palen-McCoy Wilderness to the west. The BSPP, when combined with other proposed solar projects in the McCoy Wash valley, could obstruct movement for any wildlife movement across the valley floor. Movement along the mountain slopes between the two site would remain unimpeded; however, movement along the toe slopes of the McCoy Mountains could be disrupted by the effects of operation (noise, lighting, human disturbance, and an increase in avian predators from new structural perching sites. The contribution of the BSPP to future cumulative impacts on the Palen-Ford WHMA, Big Maria Mountains WHMA, and the DWMA Continuity WHMAs would be nil.

Table 4.21-2 compares the desert tortoise habitat compensation required under the differing action alternatives for the BSPP.

TABLE 4.21-2
COMPARISON OF COMPENSATORY MITIGATION REQUIREMENTS FOR PROPOSED ACTION, RECONFIGURED ALTERNATIVE, AND REDUCED ACREAGE ALTERNATIVES[a]

Habitat	Mitigation Ratio	Proposed Action (acres)	Reconfigured Alternative (acres)	Reduced Acreage Alternative (acres)
Desert tortoise habitat (state waters and Sonoran creosote bush scrub)	1:1	7,027	5,439	4,165
Total desert tortoise compensatory mitigation Mitigation Measure BIO-12		***7,02***	***5,439***	***4,165***

[a] Does not include impact acreage from construction of transmission line and substation.

SOURCE: CEC RSA June 2010 Biological Resources Table 8

4.21.4 Summary of Mitigation Measures

The mitigation measures imposed by the Energy Commission as Conditions of Certification for the BSPP would avoid or reduce impacts on the quality of the human environment. Moreover compensation would be required as well. These mitigation measures are set forth in Appendix G. The following mitigation measures would avoid or minimize impacts on wildlife resources[1]:

> BIO-1, BIO-2, BIO-3, BIO-4, BIO-5, BIO-6, BIO-7, BIO-8, BIO-9, BIO-10, BIO-11, BIO-12, BIO-13, BIO-15, BIO-16, BIO-17, BIO-18, BIO-20, BIO-21, BIO-23, BIO-24, BIO-25, BIO-26, BIO-27, BIO-28

To address potential impact to Climate Change, the BLM would require, as discussed in Section 4.17 Vegetation, in concert with BIO-7, the following:

> **BLM BIO-7a:** The Applicant shall ensure that monitoring accomplished under BIO-7 and other mitigating measures use available climatalogical data when analyzing project effects or resource trends.

To address potential impacts to Nelson's Big Horn Sheep, the BLM would require, in concert with BIO-21, the following:

> **BLM BIO-21:** The Project owner shall be responsible for providing adequate funding to install a water source, complete with an environmental assessment analyzing the impacts of the guzzler installation and operation, monitor and manage the water source for the life of the project. $100,000 is required to fulfill the terms of this condition; the excess shall be refunded to the Project owner. The Project owner shall provide financial assurances to the CDFG with copies of the document(s) to BLM, to guarantee that an adequate level of funding is available to implement the mitigation measures described in this condition. Security shall be in the amount of the initial estimate of $100,000.

[1] The CEC document intertwined vegetation and wildlife resources in the mitigation measures and these have not be modified because as a whole they mitigation the impacts to vegetation and wildlife resources.

4.21.5 Residual Impacts after Mitigation Measures were Implemented

The BSPP would eliminate all habitat for wildlife within the BSPP site. The BSPP would also directly and indirectly affect an extensive network of desert washes in the disturbance area, and would alter the hydrology of the area by re-routing these waterways through five engineered channels. Mitigating measures to avoid, minimize, or compensate for the loss would lessen the impacts to varying, but unquantified degrees but would not completely offset those losses. Routes of wildlife movement along washes would be cut off and wildlife movement from the mountainous southwest to the northeast would be severely curtailed due to perimeter fencing and the impacted washes. Wildlife trailing along the fence to find a suitable route would be subject to increased vulnerability to predation. Gaps in fencing, if not maintained to standards could trap desert tortoises, badgers, kit foxes, burro deer, or Nelson's bighorn sheep.

In addition to direct loss of habitat, the BSPP would fragment and degrade adjacent native wildlife communities, and could promote the spread of invasive non-native plants and increase the presence of desert tortoise predators such as ravens. These habitats provide foraging, cover, and/or breeding habitat for a variety of resident wildlife, including the state and federally-listed desert tortoise, American badger, desert kit fox, golden eagle, migratory birds, burrowing owl, Nelson's bighorn sheep, burro deer, and Mojave fringe-toed lizard.

4.21.6 Unavoidable Adverse Impacts

Under the technology proposed in the three BSPP alternatives, the Proposed Action, Reconfigured Alternative, and Reduced Acreage Alternative, the native wildlife communities would be lost, totaling 7,027 acres, 5,439 acres, and 4,165 acres respectively. Habitat types impacted by the proposed BSPP include upland habitat types such as Sonoran creosote bush scrub and stabilized and partially stabilized sand dunes, as well as desert dry wash woodlands and vegetated ephemeral swales. The BSPP would result in loss of habitat for desert tortoise, of spring foraging habitat for Nelson's bighorn sheep, and would degrade and fragment adjacent wildlife communities, decreasing regional connectivity and dispersal of resident wildlife. Additionally, the BSPP is likely to promote the spread of invasive non-native plants, and subsidize desert tortoise predators such as common raven, coyotes, and feral dogs. Construction, operations, or maintenance activities could result in some death, harm, harassment, removal, or capture of wildlife, including eggs and nests which would constitute unavoidable loss of individual animals.

4.22 Irreversible and Irretrievable Commitment of Resources

The National Environmental Policy Act (NEPA) requires an analysis of the significant irreversible effects of a proposed action. Resources irreversibly or irretrievably committed to a proposed action are those used on a long-term or permanent basis. This includes the use of nonrenewable resources such as metal, wood, fuel, paper, and other natural or cultural resources. These resources are considered nonretrievable in that they would be used for a proposed action when they could have been conserved or used for other purposes. Another impact that falls under the category of irreversible and irretrievable commitment of resources is the unavoidable destruction of natural resources that could limit the range of potential uses of that particular environment.

The BSPP would irretrievably commit resources over the 30-40 year life of the project. After 30-40 years, the BSPP is planned to be decommissioned and the land returned to its pre-project state. This would indicate that potentially some of the resources on site could be retrieved. However, 30-40 years is a long time and many variables could affect the project over that period. In addition, it is debatable as to how well the site can recover to its pre-project state. Open desert lands and sensitive desert habitats can take a long time to recover from disturbances such as development. The BSPP site is not currently entirely undisturbed due to the presence of off-highway vehicle use.

The BSPP is a renewable energy project intended to generate solar energy to reduce reliance on fossil fuels. Over the 30-40 year life of the BSPP, this renewable energy project would contribute incrementally to the reduction in demand for fossil fuel use for electricity-generating purposes. Therefore, this incremental reduction in expending fossil fuels would be a positive effect of the commitment of nonrenewable resources to the BSPP.

4.23 Short-term vs. Long-term Productivity of the Environment

The short-term uses of the environment as a result of the BSPP and its built alternatives include those typically found with solar energy development. Short-term impacts associated with construction activities described elsewhere in Chapter 4, Environmental Consequences, include effects to the natural environment, cultural resources, and recreation resources. These can be compared to the long-term benefits of the proposed action and its built alternatives all of which would provide for the production of clean, renewable energy consistent with Federal and State goals to increase production of renewable energy to help reduce dependence on fossil fuels.

As discussed earlier in Section 4.22, Irreversible and Irretrievable Commitment of Resources, the proposed action and alternative could permanently damage sensitive desert habitats, which in turn could adversely affect the long-term productivity of the area. However, these built alternatives would all also provide a long-term benefit by providing electric power without any increase in the use of non-renewable resources such as fossil fuels, which would result in a benefit to air quality and a reduction in carbon-based emissions.