

4.0 Environmental Consequences

Introduction

The proposed action and alternatives outlined in Chapter 2 may cause, directly or indirectly, changes in the human and physical/natural environment. This Environmental Impact Statement (EIS) assesses and analyzes these potential changes and discloses the effects to decision makers and the public. This process of disclosure is one of the fundamental aims of the National Environmental Policy Act (NEPA).

The following sections define and clarify the concepts and terms used in this EIS when discussing the impacts assessment.

Effects

Effects may refer to ecological, aesthetic, historical, cultural, economic, social, or health-related phenomena that may be caused by the proposed action or alternatives. Effects may be direct, indirect, or cumulative.

Direct Effects

A direct effect occurs at the same time and place as the action. Direct and indirect effects are discussed in combination under each affected resource.

Indirect Effects

Indirect effects are reasonably foreseeable effects that occur later in time or are separated by some distance from the action. Direct and indirect effects are discussed in combination under each affected resource.

Cumulative Effects

Effects on a resource are cumulative when added to the effects (or anticipated effects) from other past, present, or future projects in the cumulative effects area for the project. The cumulative effects area may be larger than the direct effects area.

Residual Impacts

Effects are considered residual when the effect from the proposed project cannot be completely avoided or minimized and remain after or despite mitigation.

Duration

When describing the duration of effects, “temporary” refers to those effects that would occur primarily during construction. “Short-term” refers to effects lasting three years or less. Long-term” refers to effects lasting more than three years.

Significance

“Significant” has a very particular meaning when used in a NEPA document. Significance is defined by CEQ (Sec. 1508.27) as a measure of the *intensity* and *context* of the effects of a major federal action on, or the importance of that action to, the human environment.

Significance is a function of the beneficial and adverse effects of an action on the environment. Intensity refers to the severity or level of magnitude of impact. Public health and safety, proximity to sensitive areas, level of controversy, unique risks, or potentially precedent-setting effects are all factors to be considered in determining intensity of effect.

Context means that the effect(s) of an action must be analyzed within a framework or within physical or conceptual limits. Both long- and short-term effects are relevant.

Impact Indicators

Impact indicators are the consistent currency used to determine quality, intensity, and duration of change in a resource. Working from an established existing condition (i.e., the baseline conditions described in Chapter 3), this indicator would be used to predict or detect change in a resource related to causal effects of proposed actions.

Mitigation

Where applicable, mitigation measures are proposed in this document. Mitigation measures are solutions to environmental impacts that are applied in the impact analysis to reduce intensity or eliminate the impacts. To be adequate and effective, CEQ rules (40 CFR, Part 1508.20) require that mitigation measures fit into one of five categories:

- Avoiding the impact altogether by not taking a certain action or parts of an action;
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or
- Compensating for the impact by replacing or providing substitute resources or environments.

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:

- Measures that have been proposed by the applicant;
- Regulatory requirements of other federal, state, and local agencies;
- USFWS terms and conditions identified in the Biological Opinion; and
- Additional BLM-proposed mitigation measures, standard right-of-way (ROW) grant terms and conditions, and best management practices.

These requirements are generically referred to as “Mitigation Measures” throughout this FEIS. Because these Mitigation Measures are derived from a variety of sources, they also often are required, and their implementation regulated, by the various agencies. For instance, the mitigation measures proposed by the applicant have been accepted by the BLM and have been incorporated into the project description. 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 project 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 with the project applicant. For instance, mitigation land is required by the CDFG. The project applicant will be required by the Record of Decision (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.

As noted above, the BLM recognizes that other agency’s requirements are not generally within the enforcement authority of the BLM since the other agency’s requirements are requirements originating in State law and regulation. While the project applicant must comply with these measures, they are not directly enforceable by the BLM except in the general sense referred to above. For those requirements that are also within the enforcement authority of the BLM because of overlapping authorities, the BLM incorporates those requirements into its ROW grant as its own terms and conditions subject to its enforcement authority.

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.

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 this project that are needed for construction, operation, and maintenance of the project. 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 right-of-way grant 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 FEIS identifies recommended mitigation measures that would:

1. Require compliance with 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, streambed alteration, 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 right-of-way 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 right-of-way 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 project 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 right-of-way 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 right-of-way authorization will include a required “Performance and Reclamation” bond to ensure compliance with the terms and conditions of the right-of-way 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.

4.1 Air Quality and Climate

This section discusses effects on existing air quality and climate conditions that may occur with implementation of the Proposed Action or alternatives. First, the indicators used to identify and analyze effects are presented; second, potential effects are discussed, and agency (BLM, EPA, MDAQMD) recommended mitigation measures are presented; third, a discussion of residual and cumulative effects is provided.

4.1.1 Indicators

The project would affect air quality or climate conditions if it would:

- Conflict with or obstruct implementation of applicable air quality plans;
- Violate applicable air quality standards or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the region of the project is non-attainment under an applicable federal or state ambient air quality standard. This includes the release of emissions that exceed quantitative thresholds for ozone precursors; or
- Expose sensitive receptors to substantial pollutant concentrations.

Air District Significance Thresholds

The Mojave Desert Air Quality Management District (MDAQMD) has established emissions thresholds to evaluate air quality effects (Table 4.1-1). These values are the California Clean Air Act (CCAA) thresholds and California Environmental Quality Act significance values. For this agency, project air effects are considered major if they:

- Generate total emissions (direct and indirect) in excess of the thresholds;
- Result in a violation of any ambient air quality standard when added to the local background;
- Do not conform with the applicable attainment or maintenance plans; or
- Expose sensitive receptors to substantial pollutant concentrations.

General Federal Actions Conformity

The MDAQMD Rule 2002 implements federal requirements under 40 CFR, Part 51, Subpart W, and applies in all non-attainment and maintenance areas within the jurisdiction of the MDAQMD. According to this rule, since the site would be located in a designated federal non-attainment area for ozone and PM₁₀, the BLM as lead federal agency must make a conformity determination stating that the Proposed Action conforms to the applicable State Implementation Plan (SIP) before the action is taken.

Table 4.1-1 MDAQMD Emission Thresholds

Air Pollutant	Annual Threshold (tons per year)	Daily Threshold (pounds per day)
Carbon monoxide (CO)	100	548
Oxides of nitrogen (NO _x)	25	137
Volatile organic compounds (VOCs)	25	137
Oxides of sulfur (SO _x)	25	137
Particulate matter (PM ₁₀)	15	82
Particulate matter (PM _{2.5})	15	82
Hydrogen sulfide (H ₂ S)	10	54
Lead (Pb)	0.6	3

Source: MDAQMD 2009

Notes:

Emission thresholds are given as daily and annual values so that multi-phased projects with phases shorter than one year can be compared to the daily value.

Federal conformity requirements apply to the project because the total of direct and indirect emissions are in a non-attainment area and would exceed the PM₁₀ yearly emission rate listed in Table 4.1-2. This rule also identifies exemptions, de minimis activities, and activities presumed to conform. The requirements of this rule do not apply for those actions where the federal agency clearly demonstrates that the total of direct and indirect emissions is below the emissions levels specified in Table 4.1-2.

Table 4.1-2 General Federal Actions Conformity:
Applicable Emission Rates for Non-attainment Areas (NAAs)

Air Pollutant	Emission Rate (tons per year)
Ozone	(VOC or NO _x)
<i>Serious NAAs</i>	50
<i>Severe NAAs</i>	25
<i>Extreme NAAs</i>	10
<i>Other ozone NAAs^a</i>	100
<i>Marginal and moderate NAAs</i>	VOC: 50; NO _x : 100
Carbon Monoxide	
<i>All NAAs</i>	100
PM₁₀	
<i>Moderate NAAs</i>	100
<i>Serious NAAs</i>	70
Pb (Lead)	
<i>All NAAs</i>	25

Source: MDAQMD 1994

Note:

^a Defined as those located outside an ozone transport region

Climate Change (Greenhouse Gas)

As discussed in Section 4.1, 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. Nonetheless, at this time, there is no formal guidance on greenhouse gas (GHG) and climate change that would apply to the Proposed Action. As impact indicators, potential effects on climate change due to the increase or reduction in GHG emissions would occur if the Proposed Action would:

- Increase the consumption of energy resources, especially fossil fuels;
- Result in increased energy efficiency of and a reduction in overall GHG emissions from an existing facility;
- Generate GHG emissions, either directly or indirectly, that may have a major effect on the environment;
- Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHG;
- Affect forest resources or the capacity of desert soils for carbon storage;
- Help or hinder attainment of the state's goals of reducing GHG emissions to 1990 levels by 2020; or
- Emit annual rates that equal or exceed 25,000 metric tons of CO₂ equivalence as a result of operations (EPA Mandatory Reporting of GHG Rule).

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. For this project, this Section 4.1 considers detailed information about the potential for construction-, operation-, maintenance- and decommissioning-related activities to emit greenhouse gas emissions (GHGs) and, thereby, contribute meaningfully to global warming in light of the combined emissions of other broad-scale causes of climate change. Although it is doubtful that this individual project, standing alone, could result in significant climate change effects, the FEIS considers the "incremental impact" of 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.

4.1.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. Effects on existing air quality and climate conditions may arise from construction, operation and maintenance, or decommissioning (including equipment and vehicles), as well as from the introduction of traffic associated with the project on local roads.

4.1.2.1 Alternative 1: No Action/No Plan Amendment

Under NEPA, the BLM must consider an alternative that assesses effects that would occur if the project were not approved and the application were rejected. The No Action Alternative assumes that the ROW application is denied and the CDCA Plan is not amended. Under this alternative, the project would not be constructed, and there would be no adverse effect on air quality and climate.

4.1.2.2 Alternative 2: Land Use Plan Amendment

Alternative 2 would deny the ROW application, but the CDCA Plan would be amended to classify the site as either suitable or unsuitable for large-scale solar development. Under this alternative, the project would not be constructed, and there would be no adverse effect on air quality and climate.

4.1.2.3 Alternative 3: Proposed Action

The BLM ROW grant would consist of the authorization to construct, operate, maintain, and decommission a 45-MW PV solar power plant on the site (516 acres). The Proposed Action would be built in two phases. Phase I would have an electrical generation capacity of 20 MW; would occupy approximately 180 acres (approximately 35 percent of the ROW), and would be operational in mid-2011. A new 33-kV overhead distribution line, T1 data line, and power poles would be installed within the project ROW during Phase I.

Phase II would have an electrical generation capacity of 25 MW; would occupy approximately 240 acres (approximately 50 percent of the ROW). Phase II could begin construction as early 2011. The site disturbance associated with Alternative 3 is presented on Table 2-1. Impacts that could result from the implementation of Alternative 3 during construction, operations and maintenance, or decommissioning activities associated with Phase I and/or II are analyzed in this section.

Construction (Phases I and II)

Effect AQ-1: Short-term, adverse cumulative effect on air quality conditions resulting from construction

Construction of Phases I and II components would comprise the following sequence of activities over a period of 240 days: site clearing and preparation (including access roads), assembly and installation of facilities, and cleanup and reclamation of temporary areas. Each of these phases would generate air pollutant emissions, such as equipment and vehicle exhaust and fugitive dust. These emissions would include criteria pollutants (VOCs, NO_x, CO, SO₂, PM₁₀, and PM_{2.5}) and hazardous air pollutants, such as diesel particulate matter (PM). Diesel engines emit a complex mix of pollutants, the most visible of which are very small carbon particles or “soot,” known as diesel PM, which are a subset of PM_{2.5} emissions. In addition, the Proposed Action would directly generate GHG emissions. CO₂ and methane (CH₄) would be emitted from on-road vehicles and non-road equipment during construction. A list of equipment proposed for construction of both phases is presented in Table 4.1-3.

Table 4.1-3 Alternative 3 (Proposed Action) Construction Equipment List for Both Phases

Equipment List	Equipment Engine Size (horsepower)	Total Hourly Usage
Vibratory post driver	100-175	4,050
Crawler tractors/dozer	100-175	500
Dump, concrete, and tender trucks	on-road vehicle	120
Excavators	175-300	200
Forklifts/aerial lifts/booms	50-100	6,000
Generator/compressor	5-15	4,000

Table 4.1-3 Alternative 3 (Proposed Action) Construction Equipment List for Both Phases

Equipment List	Equipment Engine Size (horsepower)	Total Hourly Usage
Graders	175-300	80
Rollers/compactors	100-175	500
Scrapers	175-300	40
Tractors/loaders/backhoes	100-175	160
Vibratory plate (handheld)	10-15	40
Highway tractor	On-road vehicle	80
Flatbed truck	On-road vehicle	1,000
Water truck	On-road vehicle	1,000

Source: Chevron Energy Solutions data. Complete equipment information is listed in Appendix B.

Only 433 acres of the proposed site would be developed. During construction of Phase I, 192 acres would be disturbed as part of the site preparation. However, additional grading would be required in Phase II. During Phase II, 240 acres would be developed with installation of the solar PV arrays and ancillary facilities.

During construction, emissions would be generated within the boundaries of the site. Combustion products would be emitted from diesel- and gasoline-powered construction equipment. Fugitive dust would be generated from equipment movement, drilling and trenching, clearing, grading, and backfilling activities. Beyond the boundaries of the ROW, air pollutant emissions would also be generated by delivery trucks and worker vehicles on local roads. Combustion products would be emitted from on-road vehicles, and fugitive dust would be released from paved and unpaved roads. GHG emissions from construction are discussed separately at the end of this section.

Maximum daily and total air pollutant emissions were calculated for each construction phase and are presented in Table 4.1-4. This table also includes a comparison of daily emissions to applicable MDAQMD daily impact thresholds. These projected emissions are based on Table 4.1-3 and additional project design information provided by the Applicant in its ROW application.

Table 4.1-4 Alternative 3 (Proposed Action) Construction Emissions

Emission Type	Source	Emissions (pounds per day)					
		ROG	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}
<i>Phase I: 20 MW</i>							
Exhaust	Non-road equipment	7.8	30.2	63.0	0.1	3.5	3.5
	On-road vehicles	0.8	3.0	9.7	0.0	0.5	0.4
Fugitive dust emissions	Construction activities	-	-	-	-	124	17
	Roads (on-site and off-site)	-	-	-	-	48	5
Subtotal Phase I		9	33	73	0	176	27
MDAQMD daily impact threshold		137	137	548	82	82	137
Exceed impact threshold?		No	No	No	No	Yes	No
<i>Phase II: Expansion to 45 MW</i>							

Table 4.1-4 Alternative 3 (Proposed Action) Construction Emissions

Emission Type	Source	Emissions (pounds per day)					
		ROG	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}
Exhaust emissions	Non-road equipment	7.8	30.2	63.0	0.1	3.5	3.5
	On-road vehicles	0.8	3.0	9.7	0.0	0.5	0.4
Fugitive dust emissions	Construction activities	-	-	-	-	34	5
	Roads (on-site and off-site)	-	-	-	-	48	5
Subtotal Phase II		9	33	73	0	86	14
MDAQMD daily impact threshold		137	137	548	82	82	137
Exceed impact threshold?		No	No	No	No	Yes	No

Total emissions values are based on results presented in Appendix B, on a full decimal-based format. Results displayed on this table may not add up exactly due to rounding errors. These are unmitigated emissions, and mitigation measures discussed in Section 4.1.2.3 would likely reduce PM₁₀ emissions below the daily threshold.

The estimated maximum daily emissions of PM₁₀ during the construction of both phases are predicted to exceed corresponding MDAQMD daily impact thresholds. The vast majority of particulate matter would be emitted as fugitive dust during site preparation as well as from vehicle traffic on local and access roads. This disturbance in the existing air quality would be short-term (240 days per phase or 480 days for both phases). The estimated emissions in Table 4.1-4 represent peak values without mitigation and would likely occur only during a small fraction of the entire construction timeframe for each phase.

However, since the site is located in federal and state non-attainment areas for PM₁₀, the projected total construction emissions for both phases would result in a short-term effect on the existing air quality conditions (Effect AQ-1). Implementation of MM AQ-1 would reduce construction related particulate matter emissions.

In addition, emissions of non-attainment/maintenance pollutants from construction activities are potentially subject to General Conformity Rule requirements. Under this rule, applicable emissions that are not addressed in current SIPs may need to be offset Total annual emissions for each phase (Table 4.1-5) were estimated based on the total duration of the construction period (240 days) and compared with the federal action applicability criteria presented in Table 4.1-2. Emissions in each phase are below the applicable criteria. However, total annual emissions of PM₁₀, if both phases occur in the same year, would be above the CCAA threshold of 15 tons per year with a value of 16.82 tons per year.

Table 4.1-5 Alternative 3 (Proposed Action) General Federal Action Conformity Analysis (First year of operations)

Emission Type	Source	Emissions (tons per year)					
		VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}
<i>Phase I: 20 MW</i>							
Construction exhaust emissions	Non-road equipment	0.57	2.29	4.90	0.01	0.25	0.25
	On-road vehicles	0.09	0.36	1.17	0.00	0.06	0.05
Construction fugitive dust emissions	Construction activities	-	-	-	-	1.55	0.22
	Roads (on-site and off-site)	-	-	-	-	5.80	0.64
Subtotal construction emissions		0.66	2.65	6.06	0.01	7.65	1.16

Table 4.1-5 Alternative 3 (Proposed Action) General Federal Action Conformity Analysis (First year of operations)

Emission Type	Source	Emissions (tons per year)					
		VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}
Operational exhaust emissions	Heavy-duty diesel truck	0.01	0.04	0.14	0.00	0.01	0.01
	ATVs	0.05	1.14	0.01	0.00	0.00	0.00
Operational fugitive dust emissions	Roads	-	-	-	-	1.31	0.13
Subtotal operational emissions		0.06	1.19	0.15	0.00	1.31	0.14
Subtotal emissions Phase I first year		0.72	3.84	6.22	0.01	8.97	1.30
Federal action applicability criteria		100	100	100	n/a	100	n/a
Exceed federal action applicability criteria?		No	No	No	No	No	No
Phase II: Expansion to 45 MW							
Exhaust emissions	Non-road equipment	0.57	2.29	4.90	0.01	0.25	0.25
	On-road vehicles	0.09	0.36	1.17	0.00	0.06	0.05
Fugitive dust emissions	Construction activities	-	-	-	-	0.44	0.22
	Roads (on-site and off-site)	-	-	-	-	5.80	0.06
Subtotal Construction Emissions		0.66	2.65	6.06	0.01	6.54	0.58
Operational exhaust emissions	Heavy-duty diesel truck	0.01	0.04	0.14	0.00	0.01	0.01
	ATVs	0.05	1.14	0.01	0.00	0.00	0.00
Operational fugitive dust emissions	Roads	-	-	-	-	1.31	0.13
Subtotal Phase II first year		0.72	3.84	6.22	0.01	7.85	0.72
Federal action applicability criteria		100	100	100	n/a	100	n/a
Exceed federal action applicability criteria?		No	No	No	No	No	No

Notes:

n/a: Not available

1. Total emissions values are based on results presented in Appendix B, on a full decimal-based format. Results displayed on this table may not add up exactly due to rounding errors.
2. Estimations based on a 240-day construction period and a 125-day operational period over the first year of operations of each phase.

Implementation of MM AQ-1 would reduce effects on air quality resulting from the release of fugitive dust. Implementation of MM AQ-2 would reduce air quality effects resulting from the combustion of fossil fuels.

MM AQ-1: Fugitive Dust Control Plan. The Applicant has prepared and submitted for BLM approval, a Draft Dust Control Plan (DCP) that describes the fugitive dust control measures to be implemented and monitored at the construction site. This plan would also be submitted to the MDAQMD prior to the start of construction. The DCP would comply with the mitigation measures described in the Fugitive Dust Control Rules enforced by MDAQMD (Rule 403.2), as well as the existing SIP available for PM₁₀ and PM_{2.5} and the BLM Fugitive Dust/PM₁₀ Emissions Control Strategy for the Mojave Desert Planning Area. During construction, the Applicant would:

- Use periodic watering for short-term stabilization of disturbed surface area to minimize visible fugitive dust emissions. For purposes of this Rule, use of a water truck to maintain moist disturbed surfaces and actively spread water during visible dusting episodes shall be considered sufficient to maintain compliance;

- Take actions sufficient to prevent project-related trackout onto paved surfaces;
- Cover loaded haul vehicles while operating on publicly maintained paved surfaces;
- Stabilize graded site surfaces upon completion of grading when subsequent development is delayed or expected to be delayed more than thirty days, except when such a delay is due to precipitation that dampens the disturbed surface sufficiently to eliminate visible fugitive dust emissions;
- Cleanup project-related trackout or spills on publicly maintained paved surfaces within twenty-four hours;
- Reduce non-essential earth-moving activity under high wind conditions. For purposes of Rule 403.2, a reduction in earth-moving activity when visible dusting occurs from moist and dry surfaces due to wind erosion shall be considered sufficient to maintain compliance;
- Provide stabilized access route(s) to the site of the Proposed Action as soon as is feasible. For purposes of Rule 403.2, as soon as is feasible shall mean prior to the completion of construction/demolition activity;
- Maintain natural topography to the extent possible;
- Construct parking lots and paved roads first, where feasible;
- Construct upwind portions of project first, where feasible; and
- Apply a dust palliative with low environmental toxicity such as Soil Sement, Soil Seal, or Soilmaster.

During operation when undergoing weed abatement activity, the Proposed Action would not:

- Disrupt the soil crust to the extent that Visible Fugitive Dust is created due to wind erosion.

MM AQ-2: Equipment Emissions. The Applicant would implement equipment emissions control measures prior to construction of the Proposed Action, as requested by the Environmental Protection Agency during scoping. These actions would reduce diesel particulates, CO, hydrocarbons, and NO_x associated with construction activities. In addition there would be specific mitigation measures related to construction equipment emission standards/controls as contractual requirements. At a minimum, the following equipment emissions control measures would be implemented to ensure that all construction-related engines:

- Are tuned to the engine manufacturer's specification, in accordance with an appropriate timeframe;
- Do not idle for more than five minutes unless it is necessary for the operating scope;
- Are not tampered with in order to increase engine horsepower;
- Include particulate traps, oxidation catalysts, and other suitable control devices on all construction equipment used at the site;
- Use diesel fuel with a sulfur content of 15 parts per million (ppm) or less, or other suitable alternative procured in the market area; and

- Include control devices to reduce air emissions. The determination of which equipment is suitable for control devices should be made by an independent Licensed Mechanical Engineer. Equipment suitable for control devices may include generators, compressors, graders, bulldozers, and dump trucks.

The Applicant would also consult with BLM and MDAQMD to identify other potential control measures not identified above. The Applicant or designated representative should submit these measures and related construction contract specifications to the agencies involved in the environmental review and permitting process for the Proposed Action, to the extent applicable under rules and regulations (BLM, EPA, MDAQMD) prior to construction activities.

Operation and Maintenance (Phases I and II)

Operations of both phases would be totally automated. The various power components would be turned on and off automatically in the morning and night, respectively. Electrical power components that would be operated include solar field direct current (DC) electrical collector systems, DC to alternating current (AC) inverters and step-up transformers, 33-kV collector system, project switchyard, and 33-kV generation tie line. Maintenance needs for both phases would include panel washing (once per year), array visual and infrared inspection, vegetation control (as needed), and inverter and switchyard maintenance on a monthly and yearly basis. The equipment would also include all-terrain vehicles (ATVs) to go inside the array for physical inspection and parts replacement.

It is expected that potential emission sources resulting from operations and maintenance activities would be mainly related to vehicle traffic on roads, including ATVs and water trucks for panel washing. Permanent staff would consist of up to three persons, including the security officer, and additional staff would be involved only during routine maintenance activities. The projected increase in annual emissions for inspection and maintenance is presented in Table 4.1-6, and a detailed summary of operational emission estimates is presented in Appendix B.

Table 4.1-6 Alternative 3 (Proposed Action) Operation and Maintenance Emissions

Emission Type	Source	Emissions(tons per year)					
		ROG	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}
Exhaust emissions	Heavy-duty diesel truck	0.000	0.001	0.001	0.005	0.000	0.000
	ATVs	0	0	0.002	0.000	0.000	0.000
Fugitive dust emissions	Vehicles on roads	-	-	-	-	0.008	0.001
Subtotal operational emissions		0.009	0.187	0.003	0.005	0.009	0.001
MDAQMD daily significance threshold		25	25	100	15	15	25
Exceed significance threshold?		No	No	No	No	No	No
Federal action applicability criteria		100	100	100	n/a	100	n/a
Exceed federal action applicability criteria?		No	No	No	No	No	No

Notes: Total emissions values are based on results presented in Appendix B, on a full decimal-based format. Results displayed on this table may not add up exactly due to rounding errors.

Estimations of operational emissions show that the expected exhaust and fugitive dust emissions would not exceed the thresholds established by the MDAQMD or the federal action applicability criteria for general conformity. This would result in an effect on air quality conditions, which would be further reduced by implementation of MM AQ-2. Projected emissions

were calculated based on existing information from current project design; potential additional sources of air pollutant emissions from on-site equipment are not included. Additionally, this estimation does not include irregular increases in emissions due to unscheduled maintenance, which would result in short-term effects. The effects would be reduced through implementation of MM AQ-2.

Effect AQ-2: Long-term cumulative effect on air quality conditions resulting from operations

Since estimated operational and maintenance emissions of air criteria pollutants would not exceed the MDAQMD impact thresholds, project-related contributions to the existing air quality in the area would result in a long-term change to current conditions in the area. These effects would be reduced through implementation of MM AQ-1 and MM AQ-2.

Decommissioning

The expected lifespan of the Proposed Action is 30 years. According to the Applicant, if the site should be removed from power generation service, it would be made suitable for reclamation. All equipment, buildings, concrete foundations, and driven piles would be removed from the site, resulting in a potential short-term increase in air pollutant emissions (Effect AQ-3). This analysis assumes that emissions would be in a magnitude similar to those estimated for construction for Phase I (worst-case scenario from construction). This would result in short-term effects on the projected background conditions of the area, especially in levels of particulate matter.

Effect AQ-3: Short-term effect on air quality conditions resulting from decommissioning

As a construction activity, demolition is regulated by MDAQMD Rule 403.2, requiring mandatory actions on fugitive dust control. In addition, as part of the design of the Proposed Action, the Applicant would develop a decommissioning plan consistent with BLM requirements in a manner that protects public health and safety and is environmentally acceptable.

Implementation of dust control plans and emission control measures, as described in MM-AQ 1 and MM AQ-2, including planting vegetative ground cover in disturbed areas as soon as possible following decommissioning, would ensure that emissions control measures and best practices are incorporated to comply with applicable air quality standards.

Climate Change and Greenhouse Gas

Alternative 3 would directly generate GHG emissions during construction, routine operational activities, maintenance, and decommissioning. CO₂ and CH₄ would be emitted from on-road vehicles and non-road equipment during construction and from vehicles used during routine operational activities. Estimated emissions from construction and operational activities based on the information provided by the Applicant are shown in Tables 4.1-7, 4.1-8, 4.1-9. A comparison of the GHG emissions (88.3 million metric tons of carbon dioxide equivalents [MTCO₂e]) to the existing power plant inventory for California (107,243,302 MTCO₂e) shows that the emissions resulting from the Proposed Action would be 0.00008 percent of total emissions. Detailed summaries of the calculations used to estimate GHG emissions from construction and operational activities are included in Appendices B and C.

Table 4.1-7 Alternative 3 (Proposed Action) GHG Emissions during the Construction (per Phase)

Emission Type ^a	Source	GHG Emissions CO ₂ e (metric tons)
Exhaust emissions	Non-road equipment	537
	On-road vehicles	117
Fugitive dust emissions	Construction activities	-
	Roads (on-site and off-site)	-
Subtotal construction emissions per Phase		653
Total proposed action construction emissions (Phase I and II)		1,306

Notes:

^aTotal emissions values are based on results presented in Appendix B, on a full decimal-based format. Results displayed on this table may not add up exactly due to rounding errors.

Table 4.1-8 Alternative 3 (Proposed Action) GHG Emissions during the Operation and Maintenance

Emission Type ^a	Source	GHG Emissions CO ₂ e (metric tons) ^b
Exhaust emissions	Heavy-duty diesel truck	0.5
	ATVs	0.9
Fugitive dust emissions	Roads	-
Operational and maintenance direct emissions		1.3

Notes:

^aGHG emissions from electrical consumption and additional project equipment other than vehicles are not included in this estimation.

^bTotal emissions values are based on results presented in Appendix B, on a full decimal-based format. Results displayed on this table may not add up exactly due to rounding errors.

Table 4.1-9 Annualized Emissions from Proposed Action

Source	GHG Emissions CO ₂ e (metric tons) ^d
Direct operational emissions ^a	1.3
Direct construction emissions ^b	43.5
Direct decommissioning emissions ^c	43.5
Total annualized GHG emissions	88.3

Notes:

^aGHG emissions from electrical consumption and additional project equipment other than vehicles are not included in this estimation.

^bGHG emissions from construction were amortized over a 30-year-period.

^cGHG emissions from decommissioning were amortized over a 30-year-period.

^dTotal emissions values are based on results presented in Appendix B, on a full decimal-based format. Results displayed on this table may not add up exactly due to rounding errors.

In addition, fugitive emissions of sulfur hexafluoride (SF₆) and refrigerant could be emitted from the switchyard and solar PV power block equipment. The use of electricity to drive operational equipment on-site would also generate an indirect increase of GHG emissions at power generating stations linked to local electrical grids.

Currently, there is no formal BLM guidance, applicable plan, policy or regulation of an agency adopted for the purpose of reducing emissions of GHG or evaluating GHG and climate change effects. However, a comparison with existing significance criteria on GHGs in California, such as the interim GHG significance thresholds of the South Coast Air Quality Management District (SCAQMD),¹ and the existing regional emission inventories in California indicates that potential contributions from direct GHG emissions would be considered a long-term effect. In addition, in order to reduce potential GHG emission contributions, the Applicant has proposed to incorporate the following practices as part of the design of the Proposed Action:

- All construction equipment would be properly tuned, according to the manufacturer's specifications;
- Fuel for all off-road and portable diesel-powered equipment would be California Air Resources Board-certified motor vehicle fuel (non-taxed version suitable for use off-road);
- All on- and off-road diesel equipment would not be allowed to idle for more than five minutes; and
- Alternatively fueled construction equipment, i.e., compressed natural gas or biodiesel, would be used.

Since the Proposed Action is intended to generate electricity from a renewable source of energy, no increase of consumption of fossil fuels and related combustion emissions are expected. A typical 45-MW fossil fuel fired power plant in California would produce 1,448,330 metric tons of carbon dioxide equivalents (MTCO₂e) over its 30 year lifespan. Subtracting the Proposed Action GHG emissions (88.3 MTCO₂e) from these avoided emissions also indicates that the Proposed Action would assist in the attainment of the state's goals of reducing GHG emissions to 1990 levels by 2020. Therefore, a beneficial effect would result from the Proposed Action under this criterion.

The Proposed Action would not be developed within a forested area, resulting in no effects on forest resources. However, it has been documented that desert soils also have a carbon storage capacity (25.4 tons per acre, UNEP 2010), which, although it is considerably minor compared to the carbon storage capacity of forested areas (102.4 tons per acre, UNEP 2010), is considered a carbon sequestration option due to the global extension of drylands (World Resources Institute 2003). Only 433 acres of the project site (516 acres) would be developed. Of this only 12.5 acres would be graded. The remaining 420.5 acres would have the vegetation grubbed and scarified. This would result in a loss of 317.5 tons of carbon storage capacity. Considering the relative proportion between the proposed graded area and the total regional extension of the CDCA Area (approximately 300,000 acres), potential effects of the Proposed Action over the existing carbon storage capacity would be long-term.

4.1.2.4 Alternative 4: Modified Site Layout

Construction, Operation and Maintenance Impacts

Short-term construction effects during Phases I and II under this alternative would be slightly less than those identified under Alternative 3 because Alternative 4 would develop nine fewer acres than Alternative 3, and would grade five fewer acres. During construction, emissions would be generated within the boundaries of the site. Combustion products would be emitted

¹ SCAQMD Interim GHG Threshold: 10,000 metric tons per year of CO₂e

from diesel- and gasoline-powered construction equipment. Due to the reduction in the total area of disturbance compared to Alternative 3, slightly less fugitive dust would be generated from equipment movement, drilling and trenching, clearing, grading, and backfilling activities. Beyond the boundaries of the ROW, air pollutant emissions would also be generated by delivery trucks and worker vehicles on local roads. Combustion products would be emitted from on-road vehicles, and fugitive dust would be released from paved and unpaved roads. GHG emissions from construction are discussed separately at the end of this section.

The long-term effects of Alternative 4 are anticipated to be the same as Alternative 3 because operational and maintenance activities would be essentially the same. Potential emission sources resulting from operations and maintenance activities would be mainly related to vehicle traffic on roads, including ATVs and water trucks for panel washing. Permanent staff would consist of up to three persons, including the security officer, and additional staff would be involved only during routine maintenance activities.

As under Alternative 3, operational exhaust and fugitive dust emissions would not exceed the thresholds established by the MDAQMD or the federal action applicability criteria for general conformity.

Climate Change and Greenhouse Gas

Under Alternative 4, climate change and greenhouse gas impacts would be the same as those identified for Alternative 3.

General Conformity Action Analysis

Similar to Alternative 3, the estimated maximum daily emissions of PM₁₀ during the construction of both phases of Alternative 4 are predicted to exceed corresponding MDAQMD daily impact thresholds. The vast majority of particulate matter would be emitted as fugitive dust during site preparation as well as from vehicle traffic on local and access roads. This disturbance in the existing air quality would be short-term (240 days per phase or 480 days for both phases). The estimated emissions in Table 4.1-5 represent peak values without mitigation and would likely occur only during a small fraction of the entire construction timeframe for each phase.

However, since the site is located in federal and state non-attainment areas for PM₁₀, the projected total construction emissions for both phases of Alternative 4 would result in a short-term effect on the existing air quality conditions (Effect AQ-1). Implementation of MM AQ-1 would reduce construction related particulate matter emissions.

4.1.2.5 Alternative 5: Smaller Project

This alternative would reduce the output of the solar power plant from 45 MW to 30 MW and also reduce the size of the developed area from 433 to 238 acres (Figure 2-5). This alternative would include a smaller development of the area west and east of Santa Fe Fire Road and the relocation of Zircon Road.

Similar to Alternatives 3 and 4, Alternative 5 would require an amendment to the CDCA Plan to change the ROW designation to suitable for solar energy development.

Effects that could result from the implementation of Alternative 5 during construction, operations and maintenance, or decommissioning activities associated with either Phase I or II are analyzed in this section.

Construction (Phases I and II)

Effect AQ-1: Short-term, adverse cumulative effect on air quality conditions resulting from construction

Construction during Phases I and II is scheduled to last 480 days for the entire project, or 240 days for each phase. Construction components would comprise the following sequence of activities: site clearing and preparation (including access roads), assembly and installation of facilities, and cleanup and reclamation of temporary areas. Each of these phases would generate air pollutant emissions, such as equipment and vehicle exhaust and fugitive dust. These emissions would include criteria pollutants (VOCs, NO_x, CO, SO₂, PM₁₀, and PM_{2.5}) and hazardous air pollutants, such as diesel particulate matter. Diesel engines emit a complex mix of pollutants, the most visible of which are very small carbon particles or “soot,” known as diesel PM, which are a subset of PM_{2.5} emissions. In addition, the project would directly generate GHG emissions. CO₂ and CH₄ would be emitted from on-road vehicles and non-road equipment during construction. A list of equipment proposed for construction of both phases is presented in Table 4.1-10.

Table 4.1-10 Alternative 5 (Smaller Project) Construction Equipment List for Both Phases

Equipment List	Equipment Engine Size (horsepower)	Estimated hours of use Phase I	Estimated hours of use Phase II
Vibratory post driver	100-175	2,430	1,215
Crawler tractors/dozer	100-175	300	150
Dump, concrete, and tender trucks	on-road vehicle	80	40
Excavators	175-300	120	60
Forklifts/aerial lifts/booms	50-100	4,000	2,000
Generator/compressor	5-15	2,400	1,200
Graders	175-300	48	24
Rollers/compactors	100-175	300	150
Scrapers	175-300	24	12
Tractors/loaders/backhoes	100-175	96	48
Vibratory plate (handheld)	10-15	24	12
Highway tractor	On-road vehicle	48	24
Flatbed truck	On-road vehicle	600	300
Water truck	On-road vehicle	600	300

Source: Chevron Energy Solutions data. Complete equipment information is listed in Appendix B.

Only 233 acres of the proposed site would be developed. During construction of Phase I, 108 acres would be disturbed as part of the site preparation. However, additional grading would be required in Phase II. During Phase II, 120 acres would be used for the installation of the solar PV arrays and ancillary facilities.

During construction, emissions would be generated within the boundaries of the site. Combustion products would be emitted from diesel- and gasoline-powered construction equipment. Fugitive dust would be generated from equipment movement, drilling and trenching,

clearing, grading, and backfilling activities. Beyond the boundaries of the ROW, air pollutant emissions would also be generated by delivery trucks and worker vehicles on local roads. Combustion products would be emitted from on-road vehicles, and fugitive dust would be released from paved and unpaved roads. GHG emissions from construction are discussed separately at the end of this section.

Maximum daily and total air pollutant emissions were calculated for each construction phase and are presented in Table 4.1-11. This table also includes a comparison of daily emissions to applicable MDAQMD daily impact thresholds. These projected emissions are based on Table 4.1-3 and additional project design information provided by the Applicant in its ROW application.

Table 4.1-11 Alternative 5 (Smaller Project) Construction Emissions

Emission Type	Source	Emissions (pounds per day)					
		ROG	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}
Phase I: 20 MW							
Exhaust	Non-road equipment	4.8	18.5	38.7	0.05	2.1	2.1
	On-road vehicles	0.3	1.2	3.8	0.0	0.2	0.2
Fugitive dust emissions	Construction activities	-	-	-	-	43	6
	Roads (on-site and off-site)	-	-	-	-	48	5
Subtotal Phase I		5	20	42	0.1	94	14
MDAQMD daily impact threshold		137	137	548	82	82	137
Exceed impact threshold?		No	No	No	No	Yes	No
Phase II: Expansion to 10 MW							
Exhaust emissions	Non-road equipment	2.4	9.3	19.3	0.0	1.1	1.1
	On-road vehicles	0.3	1.2	3.8	0.0	0.2	0.2
Fugitive dust emissions	Construction activities	-	-	-	-	48	7
	Roads (on-site and off-site)	-	-	-	-	48	5
Subtotal Phase II		3	10	23	0	98	13
MDAQMD daily impact threshold		137	137	548	82	82	137
Exceed impact threshold?		No	No	No	No	Yes	No

Total emissions values are based on results presented in Appendix B, on a full decimal-based format. Results displayed on this table may not add up exactly due to rounding errors.

The estimated maximum daily emissions of PM₁₀ during the construction of both phases are predicted to exceed corresponding MDAQMD daily impact thresholds. The vast majority of particulate matter would be emitted as fugitive dust during site preparation as well as from vehicle traffic on local and access roads. This disturbance in the existing air quality would be short-term (240 days per phase or 480 days for both phases). The estimated emissions in Table 4.1-11 represent peak values without mitigation and would likely occur only during a small fraction of the entire construction timeframe for each phase.

However, since the site is located in federal and state non-attainment areas for PM₁₀, the projected total construction emissions for both phases would result in a short-term effect on the existing air quality conditions (Effect AQ-1). Implementation of MM AQ-1 would reduce construction related particulate matter emissions.

In addition, emissions of non-attainment/maintenance pollutants from construction activities are potentially subject to General Conformity Rule requirements. Under this rule, applicable emissions that are not addressed in current SIPs may need to be offset. Total annual emissions for each phase (Table 4.1-12) were estimated based on the total duration of the construction period (180 days) and compared with the federal action applicability criteria presented in Table 4.1-2. Emissions in each phase are below the applicable criteria. However, total annual emissions of PM₁₀, if both phases occur in the same year, would be above the CCAA threshold of 15 tons per year with a value of 15.51 tons per year.

Table 4.1-12 Alternative 5 (Smaller Project) General Federal Action Conformity Analysis (First year of operations)

Emission Type	Source	Emissions (tons per year)					
		VOC	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}
Phase I: 20 MW							
Construction exhaust emissions	Non-road equipment	0.35	1.42	3.04	0.00	0.16	0.16
	On-road vehicles	0.04	0.14	0.45	0.00	0.02	0.02
Construction fugitive dust emissions	Construction activities	-	-	-	-	0.32	0.05
	Roads (on-site and off-site)	-	-	-	-	2.25	0.25
Subtotal construction emissions		0.39	1.56	3.50	0.00	2.75	0.47
Operational exhaust emissions	Heavy-duty diesel truck	0.02	0.07	0.21	0.00	0.01	0.01
	ATVs	0.09	1.76	0.23	0.00	1.94	0.19
Operational fugitive dust emissions	Roads	-	-	-	-	1.93	0.19
Subtotal operational emissions		0.06	1.19	0.15	0.00	1.31	0.14
Subtotal emissions Phase I first year		0.72	3.84	6.22	0.01	8.97	1.30
Federal action applicability criteria		100	100	100	n/a	100	n/a
Exceed federal action applicability criteria?		No	No	No	No	No	No
Phase II: Expansion to 10 MW							
Exhaust emissions	Non-road equipment	0.57	2.29	4.90	0.01	0.25	0.25
	On-road vehicles	0.09	0.36	1.17	0.00	0.06	0.05
Fugitive dust emissions	Construction activities	-	-	-	-	0.44	0.22
	Roads (on-site and off-site)	-	-	-	-	5.80	0.06
Subtotal Construction Emissions		0.66	2.65	6.06	0.01	6.54	0.58
Operational exhaust emissions	Heavy-duty diesel truck	0.01	0.04	0.14	0.00	0.01	0.01
	ATVs	0.05	1.14	0.01	0.00	0.00	0.00
Operational fugitive dust emissions	Roads	-	-	-	-	1.31	0.13
Subtotal Phase II first year		0.48	3.32	3.72	0.01	4.63	0.46
Federal action applicability criteria		100	100	100	n/a	100	n/a
Exceed federal action applicability criteria?		No	No	No	No	No	No

Notes:

n/a: Not available

- Total emissions values are based on results presented in Appendix B, on a full decimal-based format. Results displayed on this table may not add up exactly due to rounding errors.
- Estimations based on a 180-day construction period and a 185-day operational period over the first year of operations of each phase.

Implementation of MM AQ-1 would reduce effects on air quality resulting from the release of fugitive dust. Implementation of MM AQ-2 would reduce air quality effects resulting from the combustion of fossil fuels.

Operation and Maintenance (Phases I and II)

Operations of both phases would be totally automated. The various power components would be turned on and off automatically in the morning and night, respectively. Electrical power components that would be operated include solar field DC electrical collector systems, DC to AC inverters and step-up transformers, 33-kV collector system, project switchyard, and 33-kV generation tie line. Maintenance needs for both phases would include panel washing (once per year), array visual and infrared inspection, vegetation control (as needed), and inverter and switchyard maintenance on a monthly and yearly basis. The equipment would also include ATVs to go inside the array for physical inspection and parts replacement.

It is expected that potential emission sources resulting from operations and maintenance activities would be mainly related to vehicle traffic on roads, including ATVs and water trucks for panel washing. Permanent staff would consist of up to three persons, including the security officer, and additional staff would be involved only during routine maintenance activities. The projected increase in annual emissions for inspection and maintenance is presented in Table 4.1-13, and a detailed summary of operational emission estimates is presented in Appendix B.

Table 4.1-13 Alternative 5 (Smaller Project) Operation and Maintenance Emissions

Emission Type	Source	Emissions (tons per year)					
		ROG	CO	NO _x	SO ₂	PM ₁₀	PM _{2.5}
Exhaust emissions	Heavy-duty diesel truck	0.000	0.001	0.001	0.001	0.000	0.000
	ATVs	0	0	0.001	0.000	0.000	0.000
Fugitive dust emissions	Vehicles on roads	-	-	-	-	0.008	0.001
Subtotal operational emissions		0.005	0.101	0.002	0.003	0.005	0.001
MDAQMD daily significance threshold		25	25	100	15	15	25
Exceed significance threshold?		No	No	No	No	No	No
Federal action applicability criteria		100	100	100	n/a	100	n/a
Exceed federal action applicability criteria?		No	No	No	No	No	No

Notes: Total emissions values are based on results presented in Appendix B, on a full decimal-based format. Results displayed on this table may not add up exactly due to rounding errors.

Estimations of operational emissions show that the expected exhaust and fugitive dust emissions would not exceed the thresholds established by the MDAQMD or the federal action applicability criteria for general conformity. While increased emissions would affect air quality conditions, such impacts would be reduced by implementation of MM AQ-2. Projected emissions were calculated based on existing information from current project design; potential additional sources of air pollutant emissions from on-site equipment are not included. Additionally, this estimation does not include irregular increases in emissions due to unscheduled maintenance, which would result in short-term effects in the project area. The effects would be reduced through implementation of MM AQ-2.

Effect AQ-2: Long-term cumulative effect on air quality conditions resulting from operations

Since estimated operational and maintenance emissions of air criteria pollutants would not exceed the MDAQMD impact thresholds, project-related contributions to the existing air quality in the area would result in a long-term change to current conditions in the area. These effects would be reduced through implementation of MM AQ-1 and MM AQ-2.

Decommissioning

The expected lifespan of the project is 30 years. According to the Applicant, if the site should be removed from power generation service, it would be made suitable for reclamation. All equipment, buildings, concrete foundations, and driven piles would be removed from the site, resulting in a potential short-term increase in air pollutant emissions in the area (Effect AQ-3). This analysis assumes that emissions would be in a magnitude similar to those estimated for construction for Phase I (worst-case scenario from construction). This would result in short-term effects on the projected background conditions of the area, especially in levels of particulate matter.

Effect AQ-3: Short-term effect on air quality conditions resulting from decommissioning

As a construction activity, demolition is regulated by MDAQMD Rule 403.2, requiring mandatory actions on fugitive dust control. In addition, as part of the project design, the Applicant would develop a decommissioning plan consistent with BLM requirements in a manner that protects public health and safety and is environmentally acceptable.

Implementation of dust control and emission control plans, as described in MM AQ-1 and MM AQ-2, including planting vegetative ground cover in disturbed areas as soon as possible following construction activities as part of the Applicant's decommissioning plan, would ensure that emissions control measures and best practices are incorporated to comply with applicable air quality standards.

Climate Change and Greenhouse Gas

Alternative 5 would directly generate GHG emissions during construction, routine operational activities, maintenance, and decommissioning. CO₂ and CH₄ would be emitted from on-road vehicles and non-road equipment during construction and from vehicles used during routine operational activities. Estimated emissions from construction and operational activities based on the information provided by the Applicant are shown in Tables 4.1-14, 4.1-15, 4.1-16. A comparison of the project GHG emissions (51.5 MTCO₂e) to the existing power plant inventory for California (107,243,302 MTCO₂e), not including construction) shows that emissions resulting from Alternative 5 would be 0.00005 percent. Detailed summaries of the calculations used to estimate GHG emissions from construction and operational activities are included in Appendix B.

Table 4.1-14 Alternative 5 (Smaller Project) GHG Emissions during Construction (per Phase)

Emission Type ^a	Source	GHG Emissions CO ₂ e (metric tons)
Exhaust emissions	Non-road equipment	332
	On-road vehicles	45
Fugitive dust emissions	Construction activities	-
	Roads (on-site and off-site)	-
Subtotal construction emissions per Phase		377
Total project construction emissions (Phase I and II)		754

Notes:

^aTotal emissions values are based on results presented in Appendix B, on a full decimal-based format. Results displayed on this table may not add up exactly due to rounding errors.

Table 4.1-15 Alternative 5 (Smaller Project) GHG Emissions during Operation and Maintenance

Emission Type ^a	Source	GHG Emissions CO ₂ e (metric tons) ^b
Exhaust emissions	Heavy-duty diesel truck	0.5
	ATVs	0.9
Fugitive dust emissions	Roads	-
Operational and maintenance direct emissions		1.3

Notes:

^aGHG emissions from electrical consumption and additional project equipment other than vehicles are not included in this estimation.

^bTotal emissions values are based on results presented in Appendix B, on a full decimal-based format. Results displayed on this table may not add up exactly due to rounding errors.

Table 4.1-16 Alternative 5 (Smaller Project) Annualized Emissions from the Proposed Action

Proposed Action Source	GHG Emissions CO ₂ e (metric tons) ^d
Direct operational emissions ^a	1.3
Direct construction emissions ^b	25.1
Direct decommissioning emissions ^c	25.1
Total annualized GHG emissions	51.5

Notes:

^aGHG emissions from electrical consumption and additional project equipment other than vehicles are not included in this estimation.

^bGHG emissions from construction were amortized over a 30-year-period.

^cGHG emissions from decommissioning were amortized over a 30-year-period.

^dTotal emissions values are based on results presented in Appendix B, on a full decimal-based format. Results displayed on this table may not add up exactly due to rounding errors.

In addition, fugitive emissions of SF₆ and refrigerant could be emitted from the switchyard and solar PV power block equipment. The use of electricity to drive operational equipment on-site would also generate an indirect increase of GHG emissions at power generating stations linked to local electrical grids.

Currently, there is no formal BLM guidance, applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHG or evaluating GHG and climate change effects. However, a comparison with existing significance criteria on GHG in California, such as the interim GHG significance thresholds South Coast Air Quality Management District

(SCAQMD),² and the existing regional emission inventories in California indicates that potential contributions from the direct GHG emissions would be considered a long-term effect. In addition, in order to reduce potential GHG emission contributions, the Applicant has proposed to incorporate the following practices as part of the design of Alternative 5:

- All construction equipment would be properly tuned, according to the manufacturer's specifications;
- Fuel for all off-road and portable diesel-powered equipment would be California Air Resources Board-certified motor vehicle fuel (non-taxed version suitable for use off-road);
- All on- and off-road diesel equipment would not be allowed to idle for more than five minutes; and
- Alternatively fueled construction equipment, i.e., compressed natural gas or biodiesel, would be used.

Since Alternative 5 is intended to generate electricity from a renewable source of energy, no increase of consumption of fossil fuels and related combustion emissions are expected. A typical 30-MW fossil fuel fired power in California would produce 965,553 MTCO₂e over its 30 year lifespan. Subtracting the alternative project GHG emissions (51.5 MTCO₂e) from these avoided emissions also indicates that the project would assist in the attainment of the state's goals of reducing GHG emissions to 1990 levels by 2020. Therefore, a beneficial effect would result from the project under this criterion.

The Alternative 5 would not be developed within a forested area, resulting in no effects on forest resources. However, it has been documented that desert soils also have a carbon storage capacity (25.4 tons per acre, UNEP 2010), which, although it is considerably minor compared to the carbon storage capacity of forested areas (102.4 tons per acre, UNEP 2010), is considered a carbon sequestration option due to the global extension of drylands (World Resources Institute 2003). Only 238 acres of the site (516 acres) would be developed. Of this only 12.5 acres would be graded. The remaining 230.5 acres would have the vegetation cut, but the soil would not be disturbed. This would result in a loss of 317.5 tons of carbon storage capacity. Considering the relative proportion between the project area (516 acres) and the total regional extension of the CDCA Area (approximately 300,000 acres), potential effects of the project over the existing carbon storage capacity would be considered long-term.

4.1.3 Cumulative Effects

Impact Methodology

For the cumulative effects analysis, a Cumulative Effects Study Area (CESA) has been identified to specifically address the cumulative effects for air quality. Cumulative effects can result from individually minor but collectively significant actions taken over time. Major past, present, and reasonably anticipated future land uses and disturbances in the area have been identified in Section 3.18 and include energy generation, military uses, commercial and residential developments, and roadway improvements. Dispersed recreation (including special motorized vehicle events), as well as residential and commercial development, also occur in parts of the CESAs.

² SCAQMD Interim GHG Threshold: 10,000 metric tons per year of CO₂e

Geographic Extent

Cumulative effects to air quality would consist of the incremental additions of criteria air pollutants to the atmosphere. For the purposes of this analysis, the CESA for this resource area is within ten miles of the site of the project. Local air quality conditions are unknown, but air quality within the entire MDAQMD is affected by both fugitive dust from local sources and occasionally by region-wide windblown dust during moderate to high wind episodes. These region-wide events include contributions from both local and distant dust sources, which frequently result in violations of the National Ambient Air Quality Standards (MDAQMD 1995).

Past, Present, and Reasonably Foreseeable Projects and Changes

The following projects, included in Table 3.18-1, have been identified as contributing to the cumulative degradation of air quality within the CESA since they will contribute fugitive dust and other air emissions:

- FPL Energy—CACA 47043;
- UPC Wind Management—CACA 47102;
- West Fry Wind, LLC (FPL Energy)—CACA 48902;
- Solel Inc.—CACA 50150;
- LSR Pisgah LLC—CACA 50706;
- Chevron PV Geotesting Land Use Permit—CACA 05062;
- Caltrans Camprock Rd/SR 247 Bridge and Road Realignment Right-of-Way;
- Replacement of two fire-damaged poles;
- Tomasheski Black Gold Exploratory Trenching—516 DM 11.9 F(9);
- Cove Road Right-of Way—Pave and widen access to private land;
- PGE Cushenbury Natural Gas Line;
- SB-1 Boulevard Associates-Next Era/ Lucerne Valley P200900663;
- SB-2 Granite Wind—CACA 048254;
- SB-3 Rabbit Springs Solar, LLC P200900655;
- SB-4 Strawberry Peak P200300655;
- SB-25 Parcel Map 186 to create two parcels 550 acres;
- SB-26 SPP to add a wood grinding storage and distribution;
- SB-28 CUP to establish a 90-foot monopalm tower;
- SB-29 CUP to establish an asphalt plant;
- SB-30 TPM 18506 to create 4 parcels;
- SB-31 TPM 18452 to create 3 parcels;
- SB-32 TPM 18018 to create 2 parcels;
- SB-34 TPM 18531 to create 4 parcels;
- SB-35 TPM 17919 to create 4 parcels;

- SB-36 TPM 19099 to create 4 parcels;
- SB-44 TPM 18691 to create 4 parcels;
- SB-61 TPM 17569 to create 2 parcels; and
- SB-62 TPM 18699 to create 2 parcels.

Cumulative Impact Analysis

Most of the effects from these projects would be limited to the construction phases of the project. Air quality effects anticipated under the alternatives would result in additional PM₁₀ contributions during construction. If both construction phases were to overlap, short-term exceedences of PM₁₀ would result in a cumulative effect. Anticipated levels of PM₁₀ would be 8.97 and 7.85 tons per year for Phase I and Phase II, respectively. These contributions would not result in exceedences under federal conformity determination levels. Long-term increases in fugitive dust (0.008 tons per year) would result from loss of vegetation cover. This would not exceed federal or state conformity levels.

If the other solar projects' construction activities were to overlap with the project, there would be a cumulative increase in fugitive dust. Assuming that the other projects' particulate matter contributions are similar to those expected under the Proposed Action and alternatives, the cumulative effect would be below federal or state conformity levels and not considered significant. Additional particulate matter emissions would occur from the expected residential/commercial developments within the CESA. These contributions to atmospheric dust levels cannot be quantified at this time, but given the scale of the developments, and the fact that they would likely not be built during the project's construction phases, it is not expected that they will cause a significant cumulative effect.

Implementation of Alternative 5 would have similar construction-related short-term and long-term cumulative effects on air quality conditions in the area, especially particulate matter emissions.

Impacts resulting from construction, operation, maintenance and decommissioning of the project and its alternatives would result in the emission of GHGs that, together with past, present, and reasonably foreseeable future actions, could contribute to climate change. Potential cumulative effects, whether adverse or beneficial, on climate change could be short-term (i.e., limited to the project's proposed construction period) or long-term (i.e., occur during the projected lifespan of the proposed action). Still, 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 4.1**.

4.1.4 Residual Effects

Implementation of the proposed mitigation measures would reduce adverse residual effects on air quality resulting from the release of fugitive dust during construction of the project. There would be no residual effects during operations and maintenance. During decommissioning, the proposed mitigation measures would reduce adverse residual effects on air quality from the release of fugitive dust.

Short-term cumulative effects on existing PM₁₀ levels would occur as a result of the project. Long-term effects would also result from the permanent removal of vegetation from the site, which would make the site more susceptible to regional wind events.

Short-term cumulative effects on existing PM₁₀ levels would occur as a result Alternative 5. Long-term effects would also result from the permanent removal of vegetation from the site, which would make the site more susceptible to regional wind events.

The Alternatives 3, 4 and 5 would not increase GHG emissions and would generate electricity from a renewable source. The project would result in avoided emissions of 965,553 MTCO_{2e} over the project's 30 year lifespan, producing a net benefit in the reduction of GHG emissions.

4.2 Noise

This section discusses the effects on the ambient noise and vibration levels that may occur with implementation of the Proposed Action or alternatives. First, the indicators used to identify and analyze effects are presented; second, potential effects are discussed, and agency recommended mitigation measures are presented; third, a discussion of residual and cumulative effects is provided.

4.2.1 Indicators

The primary indicator of noise levels for this analysis is the A-weighted average noise level measured in decibels (L_{eq}). The one-hour average noise level (dBA L_{eq} [1-hour]) is often used to characterize ongoing operations or long-term effects. The maximum dBA level (dBA L_{max}) is used to document the highest intensity, short-term noise level. Another commonly used measure of noise effects is L_{dn} . The L_{dn} value matches the L_{eq} value for noise generated from 7 a.m. to 10 p.m. but accounts for increased public sensitivity to noise at night by the A-weighted equivalent sound level for a 24-hour period with an additional 10 dB imposed on the equivalent sound levels for nighttime hours of 10 p.m. to 7 a.m.

San Bernardino County does not have regulations quantitatively limiting noise generation or effects from the project during the construction phase. The County does have regulations regarding noise generation from operations as discussed in Section 3.2.

The project would affect ambient noise and vibration levels if it would:

- Result in the generation of noise levels or exposure of persons and sensitive species to noise levels in excess of standards established in applicable federal, state, and local general plans or noise ordinances at nearby noise-sensitive areas.; or
- Result in generation of, or exposure of persons to, groundborne vibration or groundborne noise levels in excess of 75 VdB (generally considered intrusive for residential uses) unless allowed by federal, state, or local codes or ordinances.

4.2.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. All effects discussed in this section are direct. No indirect effects were identified for this resource area.

Effects on the existing ambient noise and vibration levels may arise from project construction, operation and maintenance, and decommissioning equipment and vehicles as well as from the introduction of construction or operations and maintenance-related traffic on local roads near the project.

4.2.2.1 Alternative 1: No Action/No Plan Amendment

The No Action Alternative assumes that the ROW application is denied and the CDCA Plan is not amended. Under this alternative, the project would not be constructed; no construction activities would occur; and, there would be no project-related effect on ambient noise and vibration.

4.2.2.2 Alternative 2: Land Use Plan Amendment

Alternative 2 would deny the ROW application, but the CDCA Plan would be amended to classify the site of the project as either suitable or unsuitable for large-scale solar development. Under this alternative, the project would not be constructed; no construction activities would occur; and there would be no project-related effect on ambient noise and vibration.

4.2.2.3 Alternative 3: Proposed Action

Effects that could result from the implementation of Alternative 3 during construction, operations and maintenance, or decommissioning activities associated with either Phase I or II are analyzed in this section.

Construction Phase I and II

Effect NOI-1: Short-term increase in ambient noise and vibration levels as a result of construction activities

Noise levels from common construction equipment at various distances can be estimated conservatively by assuming that the only sound-reducing mechanism is the divergence of the sound waves in open air. Propagation of groundborne vibration from equipment and vehicles is also assumed to be mitigated with greater distance. Construction noise and vibration levels related to the Proposed Action would vary during the construction period, depending on the construction phase and number and location of operating construction equipment. The site preparation phase would involve noise-generating activities such as clearing and grubbing, earthwork, and rough site grading; the construction of the new 33-kV distribution line, T1 data line, and new power poles and the solar panel arrays would involve the use of percussive or vibration equipment in a manner similar to installing freeway guardrails.

Individual pieces of equipment would generate noise levels in a range from 74 to 89 dBA at 50 feet from the source (Table 4.2-1). The worst case result of composite construction noise is derived by adding the individual equipment noise levels logarithmically, which would result in a maximum level of 97 dBA. In addition, a temporary increase in traffic noise on SR 247 and local roads would occur as a result of equipment delivery and workers commuting to the site.

Table 4.2-1 Alternative 3 (Proposed Action) Construction Equipment Noise Levels for the Proposed Action

Equipment List	Equivalent Federal Transit Administration Classification	Typical Sound Pressure Level (dBA) at 50 feet from source
Vibratory post driver	Pneumatic tool	85
Crawler tractors/dozer	Dozer	85
Dump, concrete, and tender trucks	Truck	88
Excavators	Backhoe	80
Forklifts/aerial lifts/booms	Crane, mobile	83
Generator/compressor	Air compressor/generator	81
Graders	Grader	85
Rollers/compactors	Roller	74
Scrapers	Scraper	89
Tractors/loaders/backhoes	Loader	85
Vibratory plate (handheld)	Compactor	82

Table 4.2-1 Alternative 3 (Proposed Action) Construction Equipment Noise Levels for the Proposed Action

Equipment List	Equivalent Federal Transit Administration Classification	Typical Sound Pressure Level (dBA) at 50 feet from source
Highway tractor	Scarifier	83
Flatbed truck	Truck	88
Water truck	Truck	88

Source: FTA 2006

Although real composite noise levels from construction activities would depend on the duration of each task and the exact number and usage factor of each piece of equipment and vehicle, it is estimated that construction activities would produce a short-term, adverse increase over the existing ambient noise levels at the site boundary of the Proposed Action (50 feet from the source). In addition, the use of percussive or vibratory equipment during the installation of the solar arrays may produce a short-term ground-borne vibration (above 75 VdB) and groundborne noise levels. Due to the location of the closest residence (located less than 0.1 mile from the site), these noise and vibration levels would not be attenuated over distance and reduced to background levels at the closest sensitive receptor (located less than 0.1 mile from the site). Because construction of Phase II would begin in the north and move to the south, disturbance from Phase II construction would result in a short-term, adverse effect to the residence. Implementation of MM NOI-1 would mitigate construction noise impacts during Phase I and Phase II construction.

Other sensitive land uses, such as recreation and special management areas may be affected by a short-term increase of noise levels. Effects on recreational users may be detectable along Santa Fe Fire Road but would be short-term and unlikely to impair the recreational resource. Special management areas in the vicinity of the site are located approximately two to ten miles from the site boundary. Therefore, no measurable change would be detected from current conditions, resulting in no effect from Phase I and II construction on sensitive land uses other than residential.

MM-NOI 1: Implement Noise Control BMPs. The Applicant would implement noise control BMPs to minimize noise effects on sensitive noise receptors. The following noise control BMPs would be implemented during construction of Phase I and II:

- Restriction of construction activities (including truck deliveries, pile driving, and vibration equipment use) to the least noise-sensitive times of day—weekday daytime hours between 7 a.m. and 10 p.m., near residential or recreational areas;
- Advance notification through public mailings and signs directed toward residents, landowners, and recreational users within one mile of the site prior to construction. The notice would state specifically where and when construction activities would occur in the area. The number would also provide a communication line or procedures to enable individuals to contact the company in the event that construction noise levels affect them;
- Installation of sound-control devices in all construction equipment, no less effective than those provided on the original equipment;
- Proper maintenance and working order of equipment and vehicles. The Applicant would ensure that all equipment is adequately muffled and maintained;
- Use of noise controls on standard construction equipment and shielding on impact tools;

- Use of broadband noise backup alarms on mobile equipment;
- Installation of mufflers on exhaust stacks of all diesel and gas-driven engines;
- Ensure proper installation of transformer equipment by
 - Placing transformer units near multiple reflective surfaces, such as in corners, near a ceiling or floor, or in a hallway,
 - Using sound-dampening pads between each transformer and the mounting surface,
 - Using flexible conduit couplings between each transformer and the associated wiring system, and
 - Mounting the transformers on surfaces with a large mass to avoid amplifying the sound.

Operation and Maintenance (Phases I and II)

Effect NOI-2: Long-term increase in ambient noise levels as a result of operational noise

Phase I and II operations would be totally automated. The various power components would be turned on and off automatically in the morning and evening, respectively. Electrical power components that would be operated include solar field direct current (DC) electrical collector systems, DC to alternating current (AC) inverters and step-up transformers, 33-kV collector system, switchyard, and 33-kV tie-in line.

Permanent staff would include two to three persons, including the nightly security officer. Maintenance needs would include panel washing (monthly), array visual and infrared inspection, vegetation control (as needed), and inverter and switchyard maintenance. The equipment would also include all-terrain vehicles to go inside the array for physical inspection and parts replacement.

There would be three potential sources of long-term operational noise during Phase I and II: noise from operation of electrical equipment, corona noise from the 33-kV distribution tie-in line, and noise from vehicle operations during routine operations and maintenance. In addition, there would be an increase in local traffic noise resulting from workers traveling to and from the site.

Noise from electrical equipment, such as transformers, is characterized as a discrete low frequency hum (Bell and Bell 1994). Among this type of equipment, transformers would be expected to contribute the most to the composite noise at the site. The noise from transformers is produced by alternating current flux in the core that causes it to vibrate (an effect also known as magnetostriction). In addition, transformer cooling fans produce noise when they operate. This noise is produced at a frequency (Hertz [Hz]) of twice the reference line (i.e., $2 \times 60 \text{ Hz} = 120 \text{ Hz}$), which can propagate with favorable weather conditions over long distances with little potential for reduction and create disturbances for residential receptors located at distances of 3,000 to 10,000 feet (Elliot et al. 1998).

The relative loudness of transformers depends on the construction design and techniques, as well as the ambient noise levels at a site (Jefferson Electric 2009). The Phase I equipment would include a total of 10 transformers, and Phase II would include 13 transformers (one for every two megawatts of power generation) to be enclosed within each photovoltaic power block. The National Electrical Manufacturers Association standard sound levels for 2,000-kilovolt ampere (kVA) commercial transformers (e.g., vent-dry type) at a distance of one foot from the source are 66 dBA for self-cooled and 71 dBA for fan-cooled units (General Electric 1999). The composite noise level from identical sources—which can be predicted based on the final design,

location, and technical specifications—would add three dB per identical transformer. However, the closest transformer to the closest receptor is over 500 feet away. Even with the composite noise of multiple transformers, the sound level at the closest receptor would not exceed 55 dB. While this would result in a long-term increase in ambient noise levels, it would not be audible to the nearest receptor.

The corona effect is the ionization of the air that occurs at the surface of the energized conductor and suspension hardware due to very high electric field strength at the surface of the metal during certain conditions. Corona generates audible noise during operation of transmission lines and substation equipment. The noise is generally characterized as a crackling, hissing, or humming noise. The amount of corona produced by a transmission line is a function of the voltage of the line, the diameter of the conductor, the elevation of the line above sea level, the condition of the conductor and hardware, and the local weather conditions. Since the proposed 33-kV tie-in line would be of a lower voltage and short length (70 feet), it is anticipated that corona noise from this line would be inaudible.

Other maintenance activities, such as visual inspections, vegetation mowing, and parts replacement, would be expected to be long-term over the life of the Proposed Action. Potential effects from these activities on the existing ambient noise levels may be detectable for a short duration at the site and on local roads (minor increase in traffic), but given the relative location of the site with respect to sensitive receptors, any potential increases in the noise levels on-site are unlikely to be detectable or of concern to the general public. Therefore, there would be no long-term effects on existing ambient noise and vibration levels from operations and maintenance of the Proposed Action. No additional mitigation has been identified.

Decommissioning

The expected life of the Proposed Action is 30 years. According to the Applicant, in the event that the site should be removed from power generation service, it would be made suitable for reclamation. All equipment, buildings, concrete foundations, and driven piles would be removed from the site, generating a temporary and localized increase in ambient noise levels during decommissioning. The Applicant would develop a decommissioning plan consistent with BLM requirements in a manner that protects public health and safety and is environmentally acceptable. With the implementation of MM NOI-1, adverse effects during decommissioning would be localized and short-term.

4.2.2.4 Alternative 4: Modified Site Layout

Alternative 4 has been analyzed in response to comments received during public scoping in order to reduce effects on visual resources. This alternative is similar to Alternative 3 but would include maintaining a 50-foot setback from Santa Fe Fire Road; using native vegetation within the setback area as a vegetative screen, and modifying the site drainage to provide a water source for the vegetative screen, if feasible.

Potential effects during Phases I and II would be similar to those identified under Alternative 3; however, since the project would be moved 50 feet farther away from the closest sensitive receptor the noise levels at the property line would be attenuated, in addition the proposed vegetative screen could provide an additional barrier to noise, reducing potential effects of operations and maintenance noise on the closest receptors.

4.2.2.5 Alternative 5: Smaller Project Alternative

This alternative would reduce the output of the solar power plant from 45 MW to 30 MW and also reduce the size of the developed area from 433 acres to 238 acres (Figure 2-5). This alternative would include the development of 120 acres west of Santa Fe Fire Road, the relocation of Zircon Road, and the development of 108 acres east of Santa Fe Fire Road, as opposed to 240 acres under Alternative 3.

Similar to Alternatives 3 and 4, Alternative 5 would require an amendment to the CDCA Plan to change the ROW designation to suitable for solar energy development.

Effects during Phase I and II would be short-term, adverse construction noise, ground-borne vibration, and traffic noise similar to Effect NOI-1 under Alternative 3. However, since the construction periods for these phases are shorter under this alternative, effects would be for a shorter time period. Implementation of MM NOI-1 would mitigate these effects.

Because operation, maintenance and decommissioning activities for Alternative 4 would be the same as those identified for Alternative 3, impacts during operations, maintenance, and decommissioning would be similar to Alternative 3.

4.2.3 Cumulative Effects

Impact Methodology

For the cumulative effects analysis, a CESA has been identified to specifically address the cumulative effects for noise resources. Cumulative effects can result from individually minor but collectively significant actions taken over time. Major past, present, and reasonably anticipated future land uses and disturbances in the area have been identified in Section 3.18 and include energy generation, military uses, commercial and residential developments, and roadway improvements. Dispersed recreation (including special motorized vehicle events), as well as residential and commercial development, also occur in parts of the CESAs.

Geographic Extent

As discussed in Section 3.2, it is a general rule that at distances greater than 50 feet, the sound pressure level from a point source of sound drops off at a rate of 6 dB with each doubling of distance away from the source. The drop-off rate also varies with both terrain conditions and the presence of obstructions in the sound propagation path. In addition, sound energy is absorbed in the air as a function of temperature, humidity, and the frequency of the sound. Therefore, with a peak noise at the site of 89 dBA at 50 feet from the source, noise levels would be lower than the allowable San Bernardino County nighttime noise levels of 45 dBA at 2.4 miles from the site. For this reason, 2.4 miles around the project site were selected as the CESA for the construction phase of the project.

Past, Present, and Reasonably Foreseeable Projects and Changes

Existing noise sources within the project area are related to vehicular traffic on local roads, OHV use, agricultural equipment, and wildlife noises. Construction of the project would generate short-term adverse noise levels at the closest noise receptor. Concurrent construction noise would be the most likely contributor to potentially greater cumulative noise effects. Projects that would generate noise during construction or operation that fall within the 2.4 mile CESA are as follows:

- Chevron PV Geotesting Land Use Permit—CACA 05062;
- SB-32 TPM 18018 to create two parcels; and
- SB-33 Pot Belly Pig Rescue.

Two foreseeable projects, SB-32 and SB-33, are within 2.4 miles of the project area. Therefore, the Chevron PV Geotesting Land Use Permit is within the project boundary, but all activities pertaining to this project were completed in October 2009. The Chevron PV Geotesting project would not contribute to cumulative effects.

SB-32 is a residential development, and SB-33 is a project to recognize a 15-acre potbelly pig rescue area. Both are approximately two miles from the site. For SB-32, it is not known whether construction would be concurrent with the project. Construction noise at this site would also attenuate over distance. If construction at SB-32 were concurrent with the project, cumulative noise levels at the residents between SB-32 and the site of the project would be unlikely to exceed allowable daytime noise or vibration levels of 75 dBA. Because SB-33 is in recognition of an existing development, no construction would be necessary.

Cumulative Impact Analysis

Noise generated during construction would be short-term, would not exceed San Bernardino County daytime noise thresholds, and would not be audible at the closest noise receptor. Therefore, operational noise would not contribute to cumulative noise effects in the area.

4.2.4 Residual Effects

There would be no residual effects from construction, operations and maintenance, and decommissioning of the Action alternatives after mitigation.

4.3 Geology, Topography, and Geologic Hazards

This section discusses effects related to geology, topography, and geologic hazards that may occur with implementation of the Proposed Action or alternatives. First, the indicators used to identify and analyze effects are presented; second, potential effects are discussed, and agency recommended mitigation measures are presented; third, a discussion of residual and cumulative effects is provided.

4.3.1 Indicators

The project would affect geologic resources or be affected by geologic hazards if it would:

- Be located on a geologic unit that is unstable or that would become unstable as a result of the project and result in on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse;
- Result in the physical alteration of or damage to geologic features; or
- Present a significant threat to public safety due to damage to project components by geologic hazards.

4.3.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. All effects discussed in this section are direct. No indirect effects were identified for this resource.

4.3.2.1 Alternative 1: No Action/No Plan Amendment

Under NEPA, the BLM must consider an alternative that assesses effects that would occur if the project were not approved and the application were rejected. The No Action Alternative assumes that the ROW application is denied and that the CDCA Plan is not amended. Under this alternative, there would be no construction and the project site would not be disturbed, thus there would be no effect on geology, topography, or public safety.

4.3.2.2 Alternative 2: Land Use Plan Amendment

Alternative 2 would deny the ROW application, but the CDCA Plan would be amended to classify the site of the project as either suitable or unsuitable for large-scale solar development. Under this alternative, there would be no construction and the project site would not be disturbed, thus there would be no effect on geology, topography, or public safety.

4.3.2.3 Alternative 3: Proposed Action

This alternative would approve the ROW application and amend the CDCA Plan to allow solar energy development. Effects that could result from the implementation of Alternative 3 during construction, operations and maintenance, or decommissioning activities associated with either Phase I or II are analyzed in this section.

Effect GEO-1: Geologic units would become unstable and would result in on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse

As discussed in Section 3.3.2.4, the site is categorized as having low susceptibility to and incidence of landslides (Godt 2001). The site is relatively flat and is located on a valley floor. Historically the hills and mountains south of the site have experienced large landslides, such as the Blackhawk Slide that was likely triggered by an earthquake about 17,000 years ago (see Section 3.3.2.2). This type of event is rare and not predictable. Risks associated with earthquakes are discussed in Effect GEO-3.

The site is on an alluvial fan that is composed of loose sediments that have not been cemented into rock. Due to the loose nature of alluvial material, the sediments of alluvial fans can move and shift, particularly during heavy precipitation events, such as flash floods (see Section 3.1.2). Extreme rain events can result in the suspension of sand, gravel, or even boulders and transport them which can cause structural damage.

No construction or operational activity would alter the character of the underlying alluvial fan to make it less stable. Under this alternative, approximately 12.5 acres would be graded and filled as necessary. Over 90 percent of the site would not be graded. Maintenance of the natural terrain and its existing drainage system would facilitate natural drainage through the site.

Construction and operational activity also would require some below grade work. The solar panel frames would be secured to foundation members which are typically H-beams driven to a depth of four to five feet below ground surface. If extremely poor soil conditions exist, augured holes with steel members embedded in concrete could be required. The electrical systems would be installed underground. In addition, concrete pad foundations for inverters and step up transformers would be installed throughout the solar field. Concrete slab foundations would be laid for the control and maintenance building and the switchyard. Disturbance associated with installation of a new 33-kV overhead distribution line, T1 data line, and power poles is included in the power line disturbance noted above. The installation of these facilities would not cause the alluvium to become more unstable.

Although the site is located on an alluvial fan whose sediments have the potential for movement during large precipitation events, the Proposed Action would be constructed to minimize that potential movement by utilizing the natural on-site drainage. Therefore, it is not likely that the geologic unit would become unstable as a result of the Proposed Action. In addition, all excavations associated with the Proposed Action would be filled with soil or a post or foundation. It would not create subterranean void spaces. The presence of subterranean void spaces can contribute to subsidence, landslides, and/or collapse. Therefore, the Proposed Action would not increase the geologic instability of the area and would not increase the risk of on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse.

Effect GEO-2: Physical alteration of or damage to geologic features.

No unique geologic features were identified at the site, so therefore, there would be no effect on a unique geologic feature.

Effect GEO-3: Project components damaged by geologic hazards present a threat to public safety.

Given that there have been over 100 earthquakes with a magnitude (M) of 5.0 or higher on the Richter scale and two above 7.0 M that have occurred within 100 miles of the proposed site, there is the potential for damage to project components due to fault rupture, earthquakes, or

seismic shaking (USGS 2005). An earthquake could cause structural damage on-site. However, all project structures would have to comply with applicable earthquake building codes; therefore, earthquake-related damage to structural components of the Proposed Action would be minimized and would be confined to the site. Since most of the site would be fenced and in a remote area, very few, if any members of the public would be exposed to potential earthquake damage at the facility. However, workers and wildlife potentially could be exposed to earthquake damage at the facility.

As discussed in Effect GEO-1, flash flooding can result in debris flow in desert environments. The alluvium at and surrounding the site could be transported during flash floods and damage on-site structures, such as solar panels, fencing, etc. The fence surrounding the facility would impede some or all of the debris flow during a flash flood event. The Applicant would perform maintenance after major storms to remove any debris that may have accumulated against the fencing and to repair any damage to the fencing. However, flash flood events could result in on-site damage that could represent a hazard to on-site workers or wildlife. The size, frequency, and intensity of flash flood events and associated damage has not been documented in this area. It is possible that a major flash flood could result in damage down gradient of the site.

Compliance with earthquake building codes and maintaining the natural drainage would minimize potential risk associated with the most likely geologic hazards in the area; however, once these events occur, they can strain or stress the existing infrastructure. With the implementation of MM GEO-1 and GEO-2, potential short- or long-term adverse effects related to the recurrence of these types of events would be reduced and any damage addressed, such that they would be short-term and localized.

MM GEO-1: Inspections After Geologic Events. To minimize or avoid potential hazards from earthquakes and other geologic events, the Applicant would have inspections performed by a BLM-approved appropriate professional (e.g., geologist, geophysicist, geologic engineer, or structural engineer) following geologic events in the vicinity of the site. The appropriate professional would perform the appropriate inspection and make recommendations to ensure that hazards are minimized for the next comparable or larger event. The Applicant would implement the appropriate the recommended corrective actions.

MM GEO-2: Applicant's Insurance Coverage. The Applicant shall acquire the appropriate insurance coverage to address potential off-site damage to structures or injury to people by facility structures that are moved off-site by a geologic event such as an earthquake or flash flood event.

4.3.2.4 Alternative 4: Modified Site Layout

Both alternatives would have the same features and project components. The primary difference with Alternative 4 is the vegetative screen that would be installed which would serve to reduce wind caused soil erosion and the alteration of the drainage to channel runoff back towards this screen. Short-term and long-term effects during Phases I and II under Alternative 4 would be slightly less than those identified under Alternative 3. Both Alternative 3 and 4 have identical construction durations, and the difference between the total areas graded and developed is five acres less for Alternative 4 compared to Alternative 3. In addition, the proposed energy generation for both alternatives would be the same at 45 MW.

4.3.2.5 Alternative 5: Smaller Project

This alternative would reduce the output of the solar plant from 45 megawatts to 30 megawatts. It would also reduce the size of the developed area from 433 acres to 238 acres (Figure 2-5). Effects under this alternative would be the similar as those identified under Alternative 3. Although the area graded and developed would be reduced, the type, intensity, and duration of effects would be similar. The same mitigation would be applicable.

4.3.3 Cumulative Effects

Impact Methodology

For the cumulative effects analysis, a CESA has been identified to specifically address the cumulative effects for geology, topography, and geologic hazards. Cumulative effects can result from individually minor but collectively significant actions taken over time. Major past, present, and reasonably anticipated future land uses and disturbances in the area have been identified in Section 3.18 and include energy generation, military uses, commercial and residential developments, and roadway improvements. Dispersed recreation (including special motorized vehicle events), as well as residential and commercial development, also occur in parts of the CESAs.

Geographic Extent

Geology, topography, and geologic hazards would be affected by altering or removing a geologic or topographic feature, or an act that would increase the risk of a geologic hazard. Since these effects depend on localized project site modifications, the CESA for geologic hazards would be the immediate vicinity of the project area, i.e., the project area itself.

Past, Present, and Reasonably Foreseeable Projects and Changes

The Chevron PV Geotesting project is the only project that occurs within the project footprint and is the only project contained within the CESA. This project would not alter any unique geologic features or create geologic hazards and thus would not cause significant cumulative effects along with the Proposed Action or the alternatives.

Cumulative Impact Analysis

As discussed above, the site has low incidence of landslides, and the project would be designed and implemented such that it would not increase the potential for landslides, lateral spreading, subsidence, liquefaction, or collapse. Because it would use the natural drainage of the area, only small parts of the facility would be graded, and it would not create subterranean void spaces. Therefore, it would not contribute cumulatively to the local geologic units becoming unstable such that on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse would occur.

Since the project would not alter any unique geologic features, it would not contribute to a cumulative effect on unique geologic features.

Structural damage associated with earthquakes would be isolated to the site. Similarly, earthquake damage to existing and foreseeable projects would be confined to each respective project's footprint. Therefore, there would be no cumulative effects associated with earthquake damage.

During a major flash flood event, it is possible that debris from the site could be taken by flood waters and represents a safety hazard. Flood waters would likely flow down gradient or north of

the site. If a flash flood had the intensity to damage the fence and dislodge solar panels, it would likely damage the residences that are downgradient of the site. Debris from the project and other damaged structures could contribute to the public safety hazards. Due to the unpredictable nature of a flash flood event, it would not be possible to mitigate for this eventuality.

Implementation of Alternatives 1 and 2 would not result in any activity at the site, and therefore, these Alternatives would not contribute to cumulative effects to geologic resources.

Alternatives 4 and 5 would not contribute cumulatively to the local geologic units becoming unstable such that on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse would occur and would not contribute to a cumulative effect to unique geologic features. They would not contribute to cumulative effects associated with earthquake damage. The potential cumulative effects from a flash flood event would be similar for Alternative 4 but would be less for Alternative 5 because there would be a smaller footprint and fewer structures that could be damaged.

4.3.4 Residual Effects

With the implementation of MM GEO-1, residual adverse effects on geology, topography, or public safety from implementation of the project would be localized.

4.4 Soils

This section discusses the effects on soil resources that may occur with implementation of the Proposed Action or alternatives. First, the indicators used to identify and analyze effects are presented; second, potential effects are discussed, and agency recommended mitigation measures are presented; and third, a discussion of residual and cumulative effects is provided.

4.4.1 Indicators

The project would affect soil resources if it would:

- Result in substantial soil erosion or loss of topsoil; or
- Result in effects on soils identified for special protection.

4.4.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. All effects discussed in this section are direct. No indirect effects were identified for this resource area.

4.4.2.1 Alternative 1: No Action/No Plan Amendment

Under NEPA, the BLM must consider an alternative that assesses effects that would occur if the project were not approved and the application were rejected. The No Action Alternative assumes that the ROW application is denied and the CDCA Plan is not amended. Under this alternative, there would be no construction and the project site would not be disturbed, thus there would be no effect on soil resources.

4.4.2.2 Alternative 2: Land Use Plan Amendment

Alternative 2 would deny the ROW application, but the CDCA Plan would be amended to classify the site of the project as either suitable or unsuitable for large-scale solar development. Under this alternative, there would be no construction and the project site would not be disturbed, thus there would be no effect on soil resources.

4.4.2.3 Alternative 3: Proposed Action

The implementation of Alternative 3 could result in the several effects on soils. The following mitigation measures would help ensure that effects on soils are reduced.

Effect SOIL-1: Substantial soil erosion or loss of topsoil.

Several factors affect the potential for soil to be eroded by water or wind, including soil texture, the length and percent of slope, vegetative cover, and intensity of rainfall or wind. As discussed in Section 3.4.2, the Proposed Action site is ranked in Wind Erodibility Group 2 (STATSGO 2006), indicating that the soils are very highly erodible. Under this alternative, approximately 433 acres would be developed.

Approximately 12.5 acres would be graded or developed. This breaks down to 0.003 acre for the switchyard, 0.006 acre for the operation and maintenance building), 7 acres for the access road, 5 acres for the power line, and 0.5 acre for the parking/laydown area. A new 33-kV overhead distribution line, T1 data line, and power poles would be installed within the project ROW during Phase I.

Another 420 acres would be grubbed or scarified for solar panel installation. No soil would be removed and brought onto the site. Both topsoil and vegetation would be removed and vegetation would not be allowed to re-grow over the approximate 12.5-acre developed area. This removal of the vegetation and grading of these areas would expose mineral soil and increase its erodibility, particularly during construction. The site is relatively flat, but it has the potential for infrequent strong rains and high winds. The use of vehicles and equipment on these areas would further increase the potential for both wind and water driven erosion. Therefore, there would a strong potential for wind and water erosion over this 12.5 acres.

The solar arrays would be installed on approximately 420 acres of the site. The solar arrays would be installed on the natural ground surface, following the topography of the area; however, grubbing and scarifying would occur over this area. This would increase the area's erodibility because vegetation in desert environments has extensive root systems. By removing these root systems, the soil stability in the area would decrease. The solar arrays would be spaced 10.5 feet apart. The solar arrays would protect the underlying soil from wind erosion and would reduce the energy of precipitation before it hits the ground surface so the potential for erosion would decrease in some areas. However, precipitation would flow off of the panels and would be concentrated at the lower ends of the panels, so this may create gullies at these locations. The lower end of the panel would be two feet off the ground surface. Ensuring that gullies are removed would be part of the normal maintenance of the site. Erosion could occur as a result of construction and operation of the Proposed Action. It could have both short-term and long-term adverse effects. Grubbing and scarifying in the solar panel area would alter the erosion potential. This issue would be particularly an issue during flash floods. Flash flood events naturally cause erosion to occur due to the high volume and speed of flowing water. If a flash flood event occurred at the site and the natural drainages were overtopped, then there would be sheet flow over some or most of the proposed site. Erosion on compacted and properly maintained graveled areas would be minimized since the gravel would protect the surface and reduce the speed of flowing water. Since the soils underneath the solar panels would be altered where the posts have been driven and from grubbing/scarifying, the erosion potential surrounding solar panels would increase relative to preconstruction conditions. Erosion would likely increase surrounding concrete pads, operations and maintenance building, and the switch yard. This effect would be short-term and adverse; its severity would depend on the size of the flood event. Implementation of MM GEO-1 would address areas where erosion occurred after flood events. Therefore, the Proposed Action would not contribute to substantial soil erosion or loss of topsoil in the area during operations.

To reduce potential effects from erosion and topsoil removal during construction, the Applicant would implement an SWPPP, which is designed to minimize erosion and decrease the potential for siltation in water bodies. Temporary siltation prevention devices would be installed. As discussed in Section 4.1.2.3, the Applicant also would implement MM AQ-1: Fugitive Dust Control Measures. Specifically, implementation of the following fugitive dust control measures would reduce the potential for erosion during construction:

- Pre-watering soils before clearing and trenching;

- Frequently watering or stabilizing excavations, spoils, access roads, storage piles, and other sources of fugitive dust (parking areas, staging areas, other); and
- Applying chemical soil stabilizers or water to form and maintain a crust on inactive construction areas (disturbed lands that are unused for four consecutive days).

During construction, there would be a short-term potential for erosion to occur. The implementation of the Applicant's erosion control measures, the SWPPP, and MM AQ-1 would minimize the amount of soil erosion and topsoil loss that would occur during construction. In addition, during both construction and operations, the Applicant would perform maintenance after major storms to remove any debris that may have accumulated against the fencing and to repair any damage to the fencing.

As discussed above grubbing and scarifying in the solar panel area would increase soil erodibility during operations, which could lead to adverse effects, particularly during flash floods. Implementation of MM SOILS-1 would address this potential of increased erosion.

MM SOILS-1: Operational phase erosion and sedimentation control measures. The Applicant would develop and implement erosion and sedimentation control measures to be used to minimize impacts during the life of the Proposed Action. At a minimum, this plan would include:

- Soil stabilization measures to offset vegetation loss;
- Biannual and post-storm monitoring of erosion and sedimentation; and
- Adaptive management of actions if erosion and sedimentation control measures are found to be insufficient to control surface water at the site. Any changes must be approved by the BLM.

The Applicant would be required to develop a decommissioning plan. The process of decommissioning the proposed facility would disturb soils in a manner similar to construction. Similar erosion and dust control measures would have to be implemented. Once the facility would be decommissioned, the soil surface would no longer be protected from wind and water erosion by the solar panels and the on-site grading would not be maintained; therefore, there would be an increased potential for erosion. Implementation of MM SOILS-2 would address this potential of increased erosion.

MM SOILS-2: Post-Decommissioning. To prevent excess erosion after decommissioning, the Applicant would document the topographic and erosional condition of the site before and after decommissioning. The Applicant would develop and implement a post-project erosion control plan. The site would be inspected quarterly for the five years following decommissioning to determine its erosional status. The Applicant would submit to the BLM yearly a report documenting erosional status of the site. The BLM would determine if corrective actions are necessary to reduce the amount of erosion.

Effect SOIL-2: Adverse effects on soils identified for special protection.

Due to the lack of protected soils at the site, development of the Proposed Action would not affect soils identified for special protection.

4.4.2.4 Alternative 4: Modified Site Layout

Both alternatives would have the same features and project components. The primary difference with Alternative 4 is the vegetative screen that would be installed which would serve to reduce wind caused soil erosion and the alteration of the drainage to channel runoff back towards this screen. Short-term and long-term effects during Phases I and II under Alternative 4 would be slightly less than those identified under Alternative 3 since only 422 acres of land are being developed. Both Alternative 3 and 4 have identical construction durations, and the difference between the total areas graded and developed is five acres less for Alternative 4 compared to Alternative 3. In addition, the proposed energy generation for both alternatives would be the same at 45 MW.

4.4.2.5 Alternative 5: Smaller Project

This Alternative would reduce the output of the solar plant from 45 megawatts to 30 megawatts. It would also reduce the size of the developed area from 433 acres to 238 acres (Figure 2-5). This alternative would consist of the development of 120 acres west of Santa Fe Fire Road, the realignment of Zircon Road, the development of 108 acres east of Santa Fe Fire Road, but the area south of the relocated Zircon Road would not be developed.

Similar to Alternatives 3 and 4, Alternative 5 would require an amendment to the CDCA Plan to change the ROW designation to be suitable for solar energy development.

Effects resulting from Alternative 5 would be similar to Alternative 4, but less than those identified for Alternative 3. Since the alternative would decrease the number of structures, specifically concrete pads and post, and the area over which erosion would occur and topsoil removed would be less than Alternative 3, then the effects from this alternative would be similar but less than those for Alternative 3. MM SOILS-1, MM SOILS-2, and MM GEO-1 would be applicable to this alternative.

4.4.3 Cumulative Effects

Impact Methodology

For the cumulative effects analysis, a CESA has been identified to specifically address the cumulative effects for soil resources. Cumulative effects can result from individually minor but collectively significant actions taken over time. Major past, present, and reasonably anticipated future land uses and disturbances in the area have been identified in Section 3.18 and include energy generation, military uses, commercial and residential developments, and roadway improvements. Dispersed recreation (including special motorized vehicle events), as well as residential and commercial development, also occur in parts of the CESAs.

Geographic Extent

Other projects proposed for development in the general project area would have an effect on soils through grading of the project site and other activities that may result in an increased rate of soil erosion. Soil loss would be mitigated by BMPs. This CESA was defined to encompass all projects in the general area of the project that could reasonably be expected to cause soil erosion from construction, operation and maintenance, or decommissioning of the project. Thus, the CESA for cumulative effects to soil resources is an area within five miles of the project. This CESA was defined arbitrarily to encompass all projects in the general area of the project that could cause soil erosion from construction, operation and maintenance, or decommissioning of the project.

Past, Present, and Reasonably Foreseeable Projects and Changes

Cumulative effects on soils may be caused by the following five projects:

- Solel Inc.—CACA 50150;
- LSR Pisgah LLC—CACA 50706;
- Chevron Geotesting Land Use Permit—CACA 50562;
- Caltrans Camprock Rd./SR 247 Bridge and Road Realignment Right-of-Way; and
- PGE Cushenbury Natural Gas Line.

The first three projects are solar projects that would cause effects to soil resources similar to those expected under the project. Similarly, any maintenance or construction actions related to the PGE Cushenbury Natural Gas Line or the Caltrans Camprock Rd./SR 247 Bridge and Road Realignment Right-of-Way (Figure 3.18-1 Ref. 9) would also contribute soil effects and would conceivably cause a cumulative effect if undertaken at the same time as construction for the project. The Chevron PV Geotesting Land Use Permit is within the project boundary, but all activities pertaining to this project were completed in October 2009. The Chevron PV Geotesting project would not contribute to cumulative effects.

Cumulative Impact Analysis

Construction of the project would involve grading certain areas of the site. Erosion could occur in these areas until they are compacted and covered with gravel. The Applicant would implement a SWPPP to minimize the amount of any soil erosion during construction. The design of the project and the Applicant's maintenance measures during operations would minimize the potential for erosion.

Erosion would occur during flash flood events. With the implementation of MM GEO-1 and MM SOILS-1, the potential adverse effects of erosion would be addressed and minimized. As with construction, there would be the potential for erosion and topsoil loss during decommissioning, the legally required erosion control measures would be implemented. MM-SOILS-2 would address any residual adverse effect of erosion post-decommissioning. Therefore, the project would not contribute to substantial soil erosion or loss of topsoil in the area.

Beginning in July 2010, all dischargers who disturb soil will be required to obtain coverage under the General Construction Permit. Previously a permit was only required if greater than one acre of soil was disturbed. This new permit will require dischargers to develop a SWPPP and implement erosion control BMPs specified in the permit. Implementation of these BMPs would minimize the amount of erosion and topsoil loss that would occur during the construction of the foreseeable projects. Therefore, the project would not contribute to a cumulative substantial increase in soil erosion or loss of topsoil.

The project would not result in effects on soils identified for special protection; therefore, it would not contribute to a cumulative effect to soils identified for special protection.

Implementation of Alternatives 1 and 2 would not result in any activity at the site, and therefore, these Alternatives would not contribute to cumulative effects to soil resources.

The cumulative effects of Alternatives 4 and 5 would not contribute to substantial soil erosion or loss of topsoil in the area, would not contribute to a cumulative substantial increase in soil erosion or loss of topsoil, and not contribute to a cumulative effect to soils identified for special protection.

4.4.4 Residual Effects

No residual effects on soil resources would result from implementation of the project.

4.5 Water Resources/Hydrology

This section discusses the effects on water resources and hydrology that may occur with implementation of the Proposed Action or alternatives. First, the indicators used to identify and analyze effects are presented; second, potential effects are discussed, and agency recommended mitigation measures are presented; third, a discussion of residual and cumulative effects is provided.

4.5.1 Indicators

The project would affect water resources and hydrology if it would:

- Increase the potential for flood hazards;
- Alter existing water flow patterns or drainages;
- Degrade the quality of groundwater for private or municipal purposes;
- Degrade the quality of surface waters by increasing erosion, increasing sedimentation, or introducing contaminated waters; or
- Decrease water supply in the project area.

4.5.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative.

4.5.2.1 Alternative 1: No Action/No Plan Amendment

Under NEPA, the BLM must consider an alternative that assesses effects that would occur if the project were not approved and the application were rejected. The No Action Alternative assumes that the ROW application is denied and the CDCA Plan is not amended. Under this alternative, there would be no construction and the project site would not be disturbed, thus there would be no effect on water resources or hydrology.

4.5.2.2 Alternative 2: Land Use Plan Amendment

Alternative 2 would deny the ROW application, but the CDCA Plan would be amended to classify the site of the project as either suitable or unsuitable for large-scale solar development. Under this alternative, there would be no construction and the project site would not be disturbed, thus there would be no effect on water resources or hydrology.

4.5.2.3 Alternative 3: Proposed Action

Effects resulting from the implementation of Alternative 3 could occur during construction, operations and maintenance, or decommissioning activities associated with either Phase I or II.

Effect WATER-1: Increase the potential for flooding hazards.

As discussed in Section 3.5.2.1, FEMA classifies the site of the Proposed Action as Zone D, indicating that there are possible but undetermined flood hazards in the area. However, residents and resource agencies have noted that this area is subject to intense flooding events, including flash floods (BLM 2009).

The Applicant is conducting flood models using the Hydrologic Engineering Centers River Analysis System [HEC-RAS] of the United States Army Corps of Engineers; however, the data were not available at the time of publication of this document. This modeling may not be appropriate for modeling flows on alluvial fans because HEC-RAS cannot address all variables that may occur during flash floods. Previous modeling by the Applicant has indicated the major drainage channels could experience high flows during episodic rain events. The available information suggests that flooding is possible in the Proposed Action area, but the intensity and frequency of these events is not known. Therefore, it is not possible at this time to estimate what the potential flood risk is at the site and the possible effects. Public safety risks associated with flooding are addressed in Effect GEO-2.

Flood hazards can increase due to multiple factors, including alteration of the natural drainage of an area to prevent adequate water flow, reducing the area within which precipitation and runoff infiltrate and increasing the impervious surface area in a region. Alteration of the natural drainage and flow patterns is discussed in Effect WATER-2.

Of the 516-acre site, 433 acres would be developed and 83 acres would be undeveloped. Of the 433 acres that would be developed approximately 12.5 acres would be graded. The solar arrays would cover 420 acres of the 516-acre ROW. The solar array area would be installed on the natural terrain; however, this area would be grubbed and scarified, which would remove vegetation and roots, decreasing soil stability. Of the 420 acres in the solar array field, less than half of the area would be shaded by solar arrays. A string of solar panels would be spaced 10 feet apart and would cover an approximate 9-foot by 51-foot area with a minimum of 1 foot between the arrays. Approximately 4,500 solar panel strings would be installed. Although the solar panel strings would be impermeable, precipitation would flow off of them onto the natural terrain. The area underneath and surrounding the solar panel strings would remain permeable; therefore, the solar panel strings would be diverting precipitation but not preventing its infiltration. Flow off the panels would be concentrated at the panel's edges and would create small troughs at the base of each panel. The Applicant would conduct regular maintenance to prevent gullies or troughs from developing.

The remaining approximate 12.5 acres of development would include the switch yard, operations and maintenance building, power line, access road, the power line corridor, and parking/laydown area. In addition, a new 33-kV overhead distribution line, T1 data line, and power poles would be installed within the project ROW during Phase I.

Approximately 7.5 acres would be graded, compacted, and covered with gravel. The 20-foot by 2-mile corridor (5 acres) for the power line would not be graded and brushed but would not be covered with gravel. The impermeable surfaces at the facility, aside from the solar arrays, would include the operations and maintenance building, the concrete foundations for the transformers and inverters, and the concrete pad in the switch yard.

The Proposed Action would increase the area of impermeable surfaces and would decrease the area of infiltration. However, due to the relatively small size of these impermeable surfaces within the larger watershed (Mojave River watershed, 4,500 square miles; Blackhawk Canyon

subbasin, 13,184 acres; and Cougar Buttes subbasin, 28,553 acres), the Proposed Action would not significantly increase the potential for flooding in the watershed or its subbasins.

Effect WATER-2: Alter existing water drainage or flow patterns.

Under this alternative, the majority of construction would occur on natural terrain without altering the natural drainage or flow patterns. The exception is approximately 12.5 acres that the site would be graded for construction of the switch yard, operation and maintenance building, the parking/laydown area, the access road, and power line corridor. A cut and fill method would be used, but no soil would be removed and brought onto the site. Vegetation would be removed and would not be allowed to re-grow on the parking lot, switch yard, operations and maintenance building, and access road. Except where structures are installed, these areas would be graded, compacted, and covered with gravel. The presence of structures and a concrete pad and the grading for these structures would alter drainage and flow patterns locally and potentially downstream.

Within the area covered by solar panels, vegetation would be removed through grubbing and scarifying. Desert vegetation has extensive root systems that absorb available water, so removing it and its root systems would decrease the stability of the soils and could increase the flow rate of floodwaters. The posts used to mount the solar panels would be impediments to flow and, depending on the volume of flow, scour could occur at these locations. This would alter drainage and flow patterns over this area and downstream.

The primary drainage channels within the site would be left intact, and sheet flow would occur throughout the site; however, depending on the extent of surficial alteration of the topography and the changes soil erodibility/stability, flow patterns could be altered in solar array areas, which could alter the overall flow pattern for the project area.

Effect Water-3: Decrease the quality groundwater for private and municipal purpose.

Groundwater quality would not be altered by the Proposed Action. Groundwater is located at 350 to 360 feet below ground surface. The Proposed Action would only use small amounts of herbicides and petroleum products during construction and operations. Implementation of the Applicant's Spill Prevention and Response Plan during construction and operations and the SWPPP during construction and decommissioning would decrease the risk of a hazardous materials spill occurring, and if one occurred, it would be cleaned up according to federal, state, and local regulations. Therefore, the Proposed Action would not degrade the quality of groundwater for private or municipal purposes.

Effect Water-4: Degrade the quality of surface waters by increasing erosion, increasing sedimentation, or introducing contaminated waters.

During construction, operations, and decommissioning activities, increased erosion could result in a decrease in surface water quality by increasing turbidity (i.e., the clay and silt load in surface water). Potential contaminants include petroleum hydrocarbons, dust suppressants, and herbicides used during construction and operation. The Applicant would use siltation prevention measures during construction and would implement its SWPPP and Spill Prevention and Response Plan. During operations, the Applicant would continue to implement its Spill Prevention and Response Plan; however, as discussed in Section 4.4.2.3, Alternative 3: Proposed Action, the removal of vegetation during construction could lead to increased erosion during operations. With the implementation of MM SOILS-1: Operational Phase Erosion and Sedimentation Control Measures and the Spill Prevention and Response Plan, potential adverse effects on surface water quality would be minimized. Therefore the proposed action

would not degrade the quality of surface waters by increasing erosion, increasing sedimentation, or introducing contaminated waters if the SWPPP and Spill Prevention and Response Plan are properly implemented.

Effect Water-5: Decrease water supply in the Proposed Action area.

During construction water would be used for dust control and soil compaction. The Applicant also plans to use polymers and flocculants for temporary dust control. The water use for construction of the first 20 MW project phase is estimated at approximately 1.75 million gallons (5.4 acre-feet). This phase is estimated to have the heaviest water use due the road construction and hardening and building construction. The second 25 MW phase is estimated to require approximately 1.25 million gallons of water (4.6 acre-feet). Water used during construction would be provided through a contract with one of the local large industrial companies or municipal water companies that have high capacity wells and water systems (CES 2009).

During operation and maintenance, water would be used primarily for panel washing. Although the actual water requirements for operations and maintenance are not known, the estimated amount of water required would be between 10,050 to 20,100 gallons for the first 20 MW installation and 22,520 to 45,240 gallons per year if the entire 45 MW field is built (CES 2010).

The water obtained for both construction and operations would be from a permitted off-site source; therefore, it would not decrease the total water supply in the Proposed Action area but would reduce the amount available for other uses.

4.5.2.4 Alternative 4: Modified Site Layout

Both alternatives would have the same features and project components. The same amount of water would be used during both construction and operations and maintenance under this alternative as would be used under Alternative 4. The primary difference with Alternative 4 is the vegetative screen that would be installed and the alteration of the drainage. The alteration of drainage under Alternative 4 would channel runoff back towards this screen. Short-term and long-term effects during Phases I and II under Alternative 4 would be slightly less than those identified under Alternative 3 since only 422 acres of land are being developed. Both Alternative 3 and 4 have identical construction durations, and the difference between the total areas graded and developed is five acres less for Alternative 4 compared to Alternative 3. In addition, the proposed energy generation for both alternatives would be the same at 45 MW.

4.5.2.5 Alternative 5: Smaller Project

This alternative would reduce the output of the solar power plant from 45 MW to 30 MW and reduce the size of the developed area from 433 to 238 acres. This alternative would consist of the development of 120 acres west of Santa Fe Fire Road, the realignment of Zircon Road, the development of 108 acres east of Santa Fe Fire Road, but the area south of the relocated Zircon Road would not be developed.

Similar to Alternatives 3 and 4, Alternative 5 would require an amendment to the CDCA Plan to change the ROW designation to suitable for solar energy development.

Effects resulting from Alternative 5 would be similar to those identified for Alternative 3. However, this alternative would slightly reduce the area graded to approximately 10 acres and decrease the area where infiltration would not occur. In addition to the reduced footprint for the

solar arrays, there would be a reduction of the area where potential drainage alteration could occur.

Assuming approximately 1,000 gallons are needed to wash a 1-MW block of panels twice per year, the maximum volume of water that would be needed for washing would be approximately 30,000 gallons, compared to the approximately 45,240 gallons needed under Alternative 3. Given the smaller footprint, water use during construction for dust control would be less than the volume needed for Alternative 3.

4.5.3 Cumulative Effects

Impact Methodology

For the cumulative effects analysis, a CESA has been identified to specifically address the cumulative effects for water resources/hydrology. Cumulative effects can result from individually minor but collectively significant actions taken over time. Major past, present, and reasonably anticipated future land uses and disturbances in the area have been identified in Section 3.18, and include energy generation, military uses, commercial and residential developments, and roadway improvements. Dispersed recreation (including special motorized vehicle events), as well as residential and commercial development, also occur in parts of the CESAs.

Geographic Extent

The CESA for water resources is the Lucerne Valley watershed, within ten miles of the project site. This CESA was chosen to be representative of the area because projects within the area are close enough that water quality and flooding issues stemming from one project may also have effects on nearby projects.

Past, Present, and Reasonably Foreseeable Projects and Changes

Cumulative effects on water resources/hydrology may be caused by the following projects:

- FPL Energy—CACA 47043;
- UPC Wind Management—CACA 47102;
- West Fry Wind, LLC (FPL Energy)—CACA 48902;
- Solel Inc.—CACA 50150;
- LSR Pisgah LLC—CACA 50706;
- Caltrans Camprock Rd./SR 247 Bridge and Road Realignment Right-of-Way;
- Tomasheski Black Gold Exploratory Trenching—516 DM 11.9 F(9);
- Cove Road Right-of Way—Pave and widen access to private land;
- PGE Cushenbury Natural Gas Line;
- Rabbit Springs Solar, LLC P200900655;
- SB-25 Parcel Map 186 to create two parcels;
- SB-30 TPM 18506 to create 4 parcels;
- SB-31 TPM 18452 to create 3 parcels;

- SB-32 TPM 18018 to create 2 parcels;
- SB-34 TPM 18531 to create 4 parcels;
- SB-35 TPM 17919 to create 4 parcels;
- SB-36 TPM 19099 to create 4 parcels ;
- SB-44 TPM 18691 to create 4 parcels;
- SB-61 TPM 17569 to create 2 parcels; and
- SB-62 TPM 18699 to create 2 parcels.

Cumulative Impact Analysis

Given the size of the watershed within which the project would be located, and the fact that the natural drainage patterns of the site would be maintained, the project would not significantly increase the potential for flooding in the area and, therefore, would not contribute cumulatively to an increased hazard for flooding.

Although the presence of structures and graded area would alter some of the on-site natural flow patterns, the primary drainage channels within the site would be left intact and sheet flow would still occur through the remainder of the site. This type of flow pattern alteration would not alter the overall flow pattern for the area and would not contribute cumulatively to changes in flow patterns or drainages in the area.

Groundwater quality would not be altered by the project because groundwater is located at 350 to 360 feet below ground surface and excavation would be to depths of less than 20 feet below ground surface. If spills were to occur, the Applicant would clean them up according to federal, state, and local regulations. Therefore, the project would not contribute cumulatively to the degradation of groundwater quality for private or municipal purposes.

The Applicant would use sedimentation prevention measures during construction as well as implement their SWPPP and their Spill Prevention and Response Plan. During operations, the Applicant would continue to implement their Spill Prevention and Response Plan. These measures would decrease the potential for adverse effects on surface water quality. Most water bodies in the area are ephemeral. As a result, no information is available about the existing surface water quality conditions. Activities that could lead to increased erosion or sedimentation would include vegetation removal, excavation, and grading. Construction activities associated with the foreseeable projects could lead to an increase in erosion and siltation; however, as discussed in Section 4.4.3, beginning in July 2010, activities that disturb soil will be required to obtain coverage under the General Construction Permit. Under this new permit, dischargers will be required to implement erosion control BMPs specified in the permit. Implementation of these BMPs would minimize or prevent the amount of erosion and sedimentation that would occur during the construction of the foreseeable projects. Therefore, the project would not contribute to a cumulative degradation of surface water quality by increasing erosion, increasing sedimentation, or introducing contaminated waters.

During construction and operation and maintenance of the project, water would be obtained from a permitted off-site source; therefore, it would not decrease the water supply in the project area and would not contribute cumulatively to a decrease in the local water supply.

Implementation of Alternatives 1 and 2 would not result in any activity at the site, and therefore, these Alternatives would not contribute to cumulative effects to hydrologic resources.

Alternatives 4 and 5 would not contribute cumulatively to an increased hazard for flooding; changes in flow patterns or drainages in the area; degradation of groundwater quality for private or municipal purposes; surface water quality by increasing erosion, increasing sedimentation, or introducing contaminated waters; or a decrease in the local water supply.

The primary contributors to cumulative effects would be the three proposed solar projects, if they were to be built concurrently with the project and if a flood event were to occur. It is possible that a short-term cumulative effect on water resources from these projects could occur under this scenario.

4.5.4 Residual Effects

No residual effects on water resources or hydrology would result from implementation of the project.

4.6 Biological Resources

This section discusses effects on biological resources that may occur with implementation of the Proposed Action or alternatives. First, the indicators used to identify and analyze effects are presented; second, potential effects are discussed, and agency required mitigation measures are presented; and third, a discussion of residual and cumulative effects is provided. This discussion format is repeated for each of the following sections: Vegetation (Section 4.6.2), Wildlife (Section 4.6.3), and Special Status Species (Section 4.6.4).

4.6.1 Indicators

In general, the project would affect biological resources by limiting the ability of special status individuals to survive, reproduce, forage, or move across the site of the project. The project would also affect biological resources by damaging or altering the ecological connections within sensitive plant and animal communities. Impact indicators are the same for all of the biological resource types addressed (vegetation, wildlife, and special status species). Adverse effects on biological resources would occur if the project would:

- Violate a legal standard for protection of a species or its critical habitat;
- Change the diversity or substantially alter the numbers of a local population of any wildlife or plant species or interfere with the survival, growth, or reproduction of affected wildlife and plant populations;
- Result in a substantial long-term loss of special status species habitat;
- Result in direct or indirect effects on a special status species or population or their habitats or that would contribute to loss;
- Result in the federal or state listing of the species (e.g., by substantially reducing species numbers or by causing permanent loss of habitat essential for the continued existence of a species);
- Interfere substantially with the movement of native resident or migratory wildlife species, wildlife corridors, or wildlife breeding sites; or
- Introduce new or invasive species to an area or substantially expand extant populations of invasive species.

4.6.2 Vegetation

Vegetation in the project area is open space dominated by creosote bush and white bursage, with desert wash and disturbed communities. Succulent plants are also present, and there are some invasive weeds. The implementation of the project would effect vegetation on and surrounding the site. Impact indicators, direct and indirect effects, cumulative effects, mitigations, and residual effects are discussed below.

4.6.2.1 Indicators

The impact indicators are the same for all biological resource types addressed (vegetation, wildlife, and special status species), as outlined in Section 4.6.1.

4.6.2.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. Effects on vegetation that could result from the implementation of the alternatives during construction, operations and maintenance, and decommissioning activities associated with either Phase I or II are analyzed in this section.

Alternative 1: No Action/No Plan Amendment

Under NEPA, the BLM must consider an alternative that assesses effects that would occur if the project were not approved and the application were rejected. The No Action Alternative assumes that the ROW application is denied and the CDCA Plan is not amended. Under this alternative, there would be no construction and the project site would not be disturbed, thus there would be no project-related effects on vegetation resources. The site would continue to be managed under the current CDCA Plan.

Alternative 2: Land Use Plan Amendment

Alternative 2 would deny the ROW application, but the CDCA Plan would be amended to designate the site of the project as either suitable or unsuitable for large-scale solar development. Under this alternative, there would be no construction and the project site would not be disturbed, thus there would be no project-related effects on vegetation resources. The site would be continued to be managed under the current plan, except in relationship to the potential use of the site for a large-scale solar development.

Alternative 3: Proposed Action

Under Alternative 3, construction and operations and maintenance activities would cause the following direct effects on vegetation:

Effect BIO-1: Loss of native vegetation communities.

Direct effects on yucca plants (e.g., Joshua trees) during construction would be short-term. The Applicant would work with San Bernardino County to develop a salvage plan that would promote the long-term survival of healthy Joshua trees and all cacti, except cholla species, to be removed as part of the project. While every effort would be taken to salvage these plants, it is recognized that cacti are difficult to successfully transplant and a large percentage are expected to be lost during salvage efforts. Plants which would directly be impacted by construction activities would be flagged for salvage and removed. In addition, no long-term adverse indirect effects on the remaining yucca plants (e.g., due to noise, vibration, dust) are anticipated because construction would be short-term and dust control measures will be in place during the operation of the facility.

Routes of travel designated "Open" by BLM would be used for ingress and egress to the site. Temporary workspaces and staging areas would adversely affect native vegetation over the short-term, but vegetation would recover following the mitigation measures below. Long-term adverse effects on vegetation would occur as a result of surface disturbing activities associated with construction, such as grading. Grading activities would cause the direct loss of approximately 12.5 acres of creosote bush-white bursage, white bursage, desert wash, and/or already disturbed vegetative communities.

The Proposed Action would remove vegetation from the solar array area by either grubbing or scarifying. Approximately 420 acres of the 516-acre ROW would have vegetation removed for developing the solar arrays. This would bare the area and would have a significant long-term effect on vegetation communities. Surface stabilization and reclamation within and along the boundaries of the site would be accomplished by removing all construction debris from the area and returning the soil to its original grade around the perimeter of the site. These activities would occur within 30 days of construction unless otherwise approved by resource agencies.

Up to 83 acres of vegetation that are not directly affected by grading or grubbing/scarifying could be indirectly affected by shading from the solar panels, which may reduce the amount of sunlight available for photosynthesis over the long-term. Also, the introduction of excess water from the washing of the panels could indirectly affect the remaining plant communities by favoring the introduction and spread of non-native invasive weeds or insect pests.

Overall, the adverse effects under Alternative 3 could include direct mortality, loss of plant habitat, plant injury, alteration of plant community structure, and community fragmentation, and dust during construction could indirectly decrease plant photosynthesis. These effects would be both short- and long-term in nature and predominantly limited to the site of the Proposed Action, with the exception of edge effects at the perimeter of the site. Implementation of MM BIO-1 through MM BIO-5 would reduce effects on native vegetation communities.

MM BIO-1: Minimize Effects on Vegetation. No direct effects on vegetation in areas outside the construction footprint would be authorized. As appropriate, areas of native vegetation would be flagged for avoidance during perimeter and desert tortoise exclusion fence construction. Within the site, healthy Joshua trees and all cacti, other than cholla, would be salvaged in accordance with the Cactus Salvage Plan.

These plants would be removed before the initiation of any ground-disturbing activities and would be protected according to a salvage plan to be developed that would be consistent with San Bernardino County's Desert Native Plant Ordinance. No vegetation would be permanently removed outside the Proposed Action area. If unforeseen circumstances require disturbance beyond the Proposed Action area, the Applicant would notify BLM immediately, and such activity shall be deferred until approved by BLM.

MM BIO-2: Manage Invasive Weeds. An Invasive Weed Management Plan, approved by the BLM and the USFWS, shall be developed to minimize the potential for introduction and spread of invasive plant species during construction and operation of the facility prior to the initiation of ground disturbing activities. Best Management Practices (BMPs) would be identified and incorporated into educational training.

Only herbicides approved by the BLM for use on public land would be used (i.e., glyphosate) for weed control. In areas where solar photovoltaic panels would be placed, the ground would be cleared of vegetation and covered with a soil binder or pea gravel. Herbicide treatment would be conducted in accordance with the Invasive Weed Management Plan. This plan would stipulate, among other provisions, that only a state and federally certified contractor, approved by the BLM, would apply herbicides. Additionally, application would be suspended when limiting conditions exist (i.e., excessive wind velocity, snow or ice covers the foliage of weeds, precipitation is occurring or is imminent, and/or air temperatures exceed 90°F). Areas outside the solar panel fields can be spot treated by applying a post-emergent herbicide prior to seed dissemination to manage the seedbank. All herbicide application would end by mid-May and not resume until the following December.

MM BIO-3: Biological Monitors. The Applicant would provide a third-party biological monitor (BM) (or BMs) to oversee compliance with BMPs and mitigation measures for protected species. The BMs would be authorized biologists, approved by the BLM, USFWS, and CDFG, would hold all required permits or agency approvals, and would be on-site during all ground-disturbing activities. The BM would have a copy of all stipulations when work is being conducted on-site. At least one BM would be on site during all construction activities. During operations, at least one BM will be “on call” (but not necessarily on site) at all times and available on an as needed basis. The most up-to-date USFWS guidance would be required for monitoring of any construction, operation, or maintenance activities that may result in injury or mortality of desert tortoises. The USFWS is currently using the Desert Tortoise Field Manual (Service 2009). CES would provide the credentials of all individuals seeking approval as BMs and monitors to the BLM. The BLM would review the credentials and provide those of appropriate individuals to the USFWS and CDFG for approval at least 30 days prior to the time they must be in the field.

Desert tortoises would be handled only by the BM (or desert tortoise monitors given approval by the BM) and only when necessary. If a desert tortoise requires relocation offsite, only the BM (or desert tortoise monitor given approval by the BM) will handle each desert tortoise when necessary. Guidance for relocating desert tortoises in the field manual (Service 2009) will be followed.

The BM would have a copy of all stipulations when work is being conducted on-site. BMs would have authority to halt activities that violate mitigation measures. BMs may also flag and instruct construction crews to avoid sensitive areas. All instances of noncompliance or incidental take of special status species would be reported to the BLM within 24 hours of occurrence. Replacement of BMs would require BLM, USFWS, and CDFG approval. BMs would be assigned to monitor each area of activity where conditions exist that may result in take of protected wildlife (e.g., clearing, grading, construction, and reclamation activities). A BM would be assigned to each construction team. BMs would maintain a detailed record of all special status species encountered.

A monthly e-mail summary report shall be provided to the BLM, documenting all effects on sensitive species, any compliance violations, and suggested remedies to conflicts during the construction phases of the Proposed Action. This report would include the following for each desert tortoise:

- 1) the locations (narrative and maps) and dates of observations;
- 2) general condition and health, including injuries and state of healing and whether animals voided their bladders;
- 3) location moved from and location moved to;
- 4) diagnostic markings (i.e., identification numbers or marked lateral scutes); and
- 5) digital photographs of each handled tortoise.

No later than 90 days after completion of construction of each phase of the project, the BM would prepare a written report for the BLM and USFWS.

During operations, a report would be submitted annually (due December 31 of each year) to the BLM and USFWS. The report would document the effectiveness and practicality of the protective measures, the number of desert tortoises excavated from burrows, moved from the site, and injured or killed, and the specific information for each animal. The report would

make recommendations for modifying the stipulations to enhance desert tortoise protection or to make it more workable for the operator. The report would provide an estimate of the actual acreage disturbed by various aspects of the operation and would note any deviations from the approved disturbance footprint, if any. The reports would document all fence monitoring and repair work conducted during the previous year as well.

MM BIO-4: Best Management Practices. Construction crews would be instructed to use BMPs, which would be identified prior to construction and included in applicable operations and education programs.

MM BIO-5: Worker Education Program. All employees and contractors working on the site would complete an education program addressing onsite biological concerns prior to the start of work. The education program would be administered by a BM who is familiar with special status species that have potential to occur on the Proposed Action site. Program content would be approved by the USFWS, the BLM, and appropriate state agencies. At a minimum, the program would cover species identification, distribution, general behavior and ecology, sensitivity to human activities, threats (including introduction of exotic plants and animals), legal protection, penalties for violations of federal and state laws, reporting requirements, and project-related mitigation measures. All field workers would be instructed that activities must be confined to locations within the approved project areas. In addition, the program would include fire prevention measures to be implemented by employees during construction and operation of the Proposed Action. The program would instruct participants to report all species observations during construction activities to a BM. Records of worker training, including dates of training events and attendees, would be maintained. Records of worker training, including dates of training events and attendees, would be maintained. These records would be provided to the BM or agency representatives upon request.

The Worker Education Program would be attended by all personnel (all onsite personnel including surveyors, construction engineers, employees, contractors, contractor's employees, supervisors, inspectors, subcontractors, and delivery personnel) prior to allowing them on the project site. All long-term personnel would attend annual refresher training. All attendees would be issued a Worker Education Program Certification Card upon completion of training – with the date of the latest training indicated on the card. All personnel would carry their Worker Education Program Certification Card with them at all times while on the project site. The Worker Education Program Certification Card would be presented to the BM or appropriate Agency Representative upon request. Failure to present such certification may serve as grounds to deny access to the project site.

Effect BIO-2: Loss of succulent plant species.

Succulent plants that would potentially be affected by the Proposed Action occur in low numbers. For example, approximately five cottontop cacti and up to 50 beavertail cacti could be affected.

Those succulent plants located in areas proposed for construction would be flagged for salvage and removed in accordance with the Cactus and Yucca Salvage Plan. Effects on succulent species would be short-term because the Applicant would implement the salvage plan, and suitable habitat for this species is present adjacent to the project area. However, it is recognized that transplantation of cacti is difficult and a large percentage of these plants are anticipated to

be lost. In addition, no long-term adverse indirect effects on this species (e.g., due to noise, vibration, dust) are anticipated because construction and maintenance activities would be temporary in nature and appropriate dust minimization measures would be in place. Adverse effects on succulent plant species would also be minimized with the incorporation of MM BIO-1, MM BIO-3 through MM BIO-5. Following these mitigation measures would enable many salvaged succulent plants to recover successfully.

Effect BIO-3: Introduction or spread of invasive, non-native, or noxious plant species.

Effect BIO-3 would directly affect native vegetation, and disturbance to these communities could allow the increase in invasive weed species, such as Sahara mustard, to spread and infest the disturbed areas.

Grading and grubbing/scarifying activities would disturb soil throughout the site, thus creating opportunities for non-native invasive weed species to colonize in areas where they had not previously occurred. Invasive weed species could outcompete native plants for such resources as water and space. Additionally, soil disturbance could reduce the native seed bank associated with the site. Dust generated during construction could adversely affect on-site and off-site native vegetation communities by reducing photosynthetic activity. Reduction of native plant species could leave denuded areas at risk for the potential spread of non-native invasive weed species. Loss of native communities and the spread of non-native invasive weeds could also occur during operations and maintenance activities, such as vegetation clearing along the perimeter fence.

During precipitation events, solar panels would be placed in the flat horizontal position. Precipitation runoff would concentrate along the drip line below the panels rather than being uniformly distributed, changing the soil water content, causing erosion of the soil at the drip line and promoting growth of weeds. Also, the periodic washing of the panels could provide supplemental water on the project site. Implementation of MM BIO-2 and MM BIO-4 would control the introduction and spread of invasive, non-native, or noxious plant species during construction and operation of the Proposed Action.

Alternative 4: Modified Site Layout

Alternative 4 would involve the same initial effect on native communities (Effect BIO-1); however, the 100-foot corridor (50-foot setback from each side of the perimeter fence or 4.4 acres) along Santa Fe Fire Road would provide an opportunity for some native vegetation to be salvaged from the construction site and transplanted. Similarly, Alternative 4 would involve the same initial effect on native plant species (Effect BIO-2). The potential for invasive species would likely be increased, as with Alternative 3, due to mechanically disturbed soil and habitat (Effect BIO-3). Short-term and long-term effects during Phases I and II under Alternative 4 would be slightly less than those identified under Alternative 3. Both Alternative 3 and 4 have identical construction durations, and the difference between the total areas grubbed/scarified is 4.4 acres less for Alternative 4 compared to Alternative 3. In addition, the proposed energy generation for both alternatives would be the same at 45 MW.

Alternative 5: Smaller Project

This Alternative would reduce the output of the solar plant from 45 megawatts to 30 megawatts. It would also reduce the size of the developed area from 433 acres to 238 acres (Figure 2-5). This alternative would consist of the development of 120 acres west of Santa Fe Fire Road, the realignment of Zircon Road, the development of 108 acres east of Santa Fe Fire Road, but the area south of the relocated Zircon Road would not be developed.

Similar to Alternatives 3 and 4, Alternative 5 would require an amendment to the CDCA Plan to change the ROW designation to suitable for solar energy development.

Under Alternative 5, construction and operations activities would cause similar direct and indirect effects as described under Alternative 3. However, only 10 acres would be graded and developed. Approximately 238 acres of the 516-acre ROW, including the area of development, would be graded and grubbed/scarified, removing all vegetation for development of the solar arrays. This alternative would reduce the area of disturbance and, therefore, reduce the amount of vegetation that would be removed compared to Alternative 3. MM BIO-1 through 5 would reduce effects associated with Alternative 5.

4.6.2.3 Cumulative Effects

Impact Methodology

For the cumulative effects analysis, a CESA has been identified to specifically address the cumulative effects for vegetation. Cumulative effects can result from individually minor but collectively significant actions taken over time. Major past, present, and reasonably anticipated future land uses and disturbances in the area have been identified in Section 3.18 and include energy generation, military uses, commercial and residential developments, and roadway improvements. Dispersed recreation (including special motorized vehicle events), as well as residential and commercial development, also occur in parts of the CESAs.

Geographic Extent

The geographic extent of the CESA for vegetation resources is a six-mile radius from the project site. The area was chosen because it encompasses several reasonably foreseeable projects and developments that could cumulatively affect the region's plant diversity and susceptibility to invasive plants.

Past, Present, and Reasonably Foreseeable Projects and Changes

Within this area, foreseeable actions include:

- Map ID No. 1 LSR Pisgah LLC—CACA 50704;
- Map ID No. 2 Solel Inc.—CACA 50150;
- Map ID No. 3 LSR Pisgah LLC—CACA 50706;
- Map ID No. 5 Chevron PV Geotesting Land Use Permit—CACA 05062;
- Map ID No. 7 Caltrans Camprock Rd./SR 247 Bridge and Road Realignment Right-of-Way;
- Map ID No. 9 PGE Cushenbury Natural Gas Line;
- Map ID No. SB-26 SPP to add a wood grinding storage and distribution;
- Map ID No. SB-29 CUP to establish an asphalt plant;
- Map ID No. SB-30 TPM 18506;
- Map ID No. SB-31 TPM 18452;

- Map ID No. SB-32 TPM 18018;
- Map ID No. SB-34 TPM 18531;
- Map ID No. SB-35 TPM 17919;
- Map ID No. SB-36 TPM 19099;
- Map ID No. SB-44 TPM 18691;
- Map ID No. SB-61 TPM 17569; and
- Map ID No. SB-62 TPM 18699.

Cumulative Impact Analysis

Although all the foreseeable projects are likely to include removal of native vegetation and soil disturbance, the solar projects would have the largest areas of disturbance. The solar projects range in size from 2400 acres to over 17,000 acres and would likely have similar types of disturbance as the project. However, the majority of these proposed sites are outside of the CESA. Effects from these projects are likely to include loss of succulent and yucca plant species and the introduction or spread of nonnative or noxious plant species. Fewer native plant communities, succulent and yucca plant species, and increased density of noxious weeds in the region would cause wildlife to forage on the fewer remaining native plants and succulents. It is not possible to estimate the amount of vegetation that would be removed by the foreseeable projects. The cumulative spatial extent of vegetation disturbance would be confined to those areas proposed for development. The proposed site is not pristine because it has been disturbed by human presence (a few residences and roads and remnant mining). Plants of concern, such as succulents and Joshua trees, would be salvaged and transplanted out of the project area. The foreseeable solar projects would likely have to implement similar measures. Within the CESA, the project would contribute to a cumulative loss of native vegetation; although the net loss of native vegetation from the foreseeable projects and the project cannot be estimated accurately, the majority of the CESA would remain desert scrub.

Most of the foreseeable projects, such as the residential developments would have to implement only limited mitigation measures. The foreseeable solar projects would likely be required to implement mitigation measures to prevent the spread of invasive, nonnative, or noxious plant species or noxious weeds, similar to the measures that would be used by the project.

Implementation of Alternatives 1 and 2 would not result in any activity at the site of the project, and therefore, these Alternatives would not contribute to cumulative impacts to vegetation.

Alternatives 4 and 5 would have similar types of cumulative impacts as Alternative 3; however, since Alternative 5 would have a smaller footprint, its contribution to cumulative impacts would be less than Alternative 3.

4.6.2.4 Residual Effects

Residual effects would occur as a result of implementing Alternative 3. Effects on native vegetation (Effect BIO-1) in the area surrounding the project would be partially mitigated by MM BIO-2. Residual effects could include the loss of 433 acres of native vegetation on the site.

Effects on succulent species located on the site (Effect BIO-2) would be short-term and mitigated by MM BIO-1 and MM BIO-3 to avoid a net loss of succulent plants in the area, although there could be some residual effects since some individual plants would be lost during the transplantation process.

Vegetation that is frequently shaded or subject to increased levels of water would eventually die and be replaced by short-lived species like invasive weeds. Effects associated with invasive weeds (Effect BIO-3) would be entirely mitigated by MM BIO-2 during construction and operations and maintenance. Potential effects resulting from dust generation (Effects BIO-1 and BIO-3) would be partially mitigated by the BMPs set forth in the Fugitive Dust Control Permit. Residual effects include the spread of weed species into areas along the project boundary where they had not previously been. Minimizing effects on vegetation (MM BIO-1), managing invasive weeds (MM BIO-2), providing biological monitors (MM BIO-3) and BMPs (MM BIO-4), providing education training addressing biological issues (MM BIO-5), would prevent or reduce effects associated with Effects BIO-1 through BIO-3.

The residual effects on vegetation would affect a localized area and occur over both the short- and long-term. Construction and operation of the project would substantially change the structure and species composition of the on-site plant communities over the lifetime of the project. The loss of up to 433 acres of native vegetation would alter or interfere with plant populations in the project area. On-site conditions would favor more disturbance-tolerant and shade tolerant species, and the site would be vulnerable to invasion by nonnative plants. Following the mitigation measures listed above, the loss of vegetation would be reduced.

Residual effects resulting from the implementation of Alternatives 4 and 5 would be similar to those described under Alternative 3. MM BIO-2 would reduce effects from invasive weeds (Effect BIO-3) in the setback proposed under Alternative 4. Similar to Alternative 3, there would be no substantial adverse effects on resources identified in the impact indicators.

4.6.3 Wildlife

The project area includes habitats that support a diversity of wildlife species. Common wildlife includes birds, mammals, and reptiles.

4.6.3.1 Indicators

The impact indicators are the same for all biological resource types addressed (vegetation, wildlife, and special status species), as outlined in Section 4.6.1.

4.6.3.2 Direct and Indirect Effects by Alternative

Effects on wildlife that could result from the implementation of the alternatives during construction, operations and maintenance, or decommissioning activities associated with either Phase I or II are analyzed in this section.

Alternative 1: No Action/No Plan Amendment

The No Action Alternative assumes that the ROW application is denied and the CDCA Plan is not amended. Under this alternative, there would be no project-related construction and the project site would not be disturbed, thus there would be no project-related effects on wildlife resources. The site would continue to be managed under the current CDCA Plan.

Alternative 2: Land Use Plan Amendment

Alternative 2 would deny the ROW application, but the CDCA Plan would be amended to designate the site of the project as either suitable or unsuitable for large-scale solar development. Under this alternative, there would be no construction and the project site would not be disturbed, thus there would be no project-related effects on wildlife resources.

Alternative 3: Proposed Action

Under this alternative, construction and operations and maintenance activities would cause the following direct effect:

Effect BIO-4: Disturb wildlife or result in wildlife mortality.

Vegetation grubbing/scarifying and grading associated with construction would directly affect wildlife by removal and crushing of shrubs and herbaceous vegetation, resulting in loss and fragmentation of cover, breeding, and foraging habitat. Furthermore, these activities and vehicle use could cause direct mortality to wildlife; slower-moving wildlife, such as small mammals, ground nesting birds, and especially reptiles, have a higher risk of mortality. Reptiles use their environment to thermoregulate. Because they do not shelter from heat and cold and are thus relatively exposed, they may not be able to avoid grading and construction activities.

Noise, vibration, and human activity would likely cause most wildlife species to avoid the Proposed Action area until the disturbance conditions have concluded. The presence of humans, construction equipment, and dust would cause wildlife to alter foraging and breeding behavior and could cause wildlife to avoid suitable habitat. To avoid avian disturbance prior to construction, the Applicant would attempt to clear Proposed Action areas of suitable nesting habitat during non-breeding season (September 1 through January 31). Once the Proposed Action is constructed, transmission poles could also pose a direct collision hazard to birds. Most species are expected to reoccupy adjacent habitats following completion of construction activities and recovery of the vegetation.

No long-term indirect effects on wildlife due to noise, vibration, or dust are anticipated because construction and maintenance activities would be temporary in nature, although wildlife would be indirectly affected because of the presence of the PV farm. Human activities in the Proposed Action area potentially provide food or other attractants in the form of trash, litter, or water, which could draw unnaturally high numbers of opportunistic predators and scavengers such as the common raven, and coyote.

Loss and degradation of habitat would cause wildlife to rely more heavily on habitat in surrounding areas. Competition could cause wildlife to forage for longer periods and/or to have lower overall nutrition. Loss of burrows due to construction, ground vibration, or avoidance behavior would also cause wildlife to search for or dig new burrows. Infrastructure built as part of the Proposed Action would alter wildlife movement in the area and just outside the boundary of the Proposed Action (especially for ground-dwelling mammals and reptiles). Fences and transmission poles could also cause increased predation of reptiles, small mammals, and small birds around the Proposed Action site because raptors would use the infrastructure for perches.

Indirect effects on wildlife would occur due to Effects BIO-1 through BIO-3. Effect BIO-1 would indirectly reduce available forage and shelter habitat for wildlife, degrading and fragmenting existing higher quality habitat. Effect BIO-2 would indirectly affect wildlife because many species depend on succulents as a source of water. Effect BIO-3 would indirectly affect wildlife because weed species, like Sahara mustard, generally have no or lower nutrition value for native wildlife.

With implementation of MM BIO-2, MM BIO-4, MM BIO-5, and the mitigation measures MM BIO-6 and MM BIO-7 below, adverse effects on wildlife in the project area would be avoided.

MM BIO-6: Preconstruction Nest Surveys. The majority of vegetation clearing would be conducted from August to February to avoid the breeding season of raptors and migratory birds; however, this period also coincides with the rainy season, which may make clearance activity in the desert difficult. If vegetation must be cleared during the breeding season, clearance surveys for nesting birds would be conducted before each phase of construction. Active nests would be avoided, and a buffer of 500 feet would be established around the active nest site. No construction activities would take place within this buffer until the biologists confirm the nest is no longer active. Also, noise levels at the nest site must be kept at ambient levels or below 60 dB L_{eq} hourly, whichever is greater. If sound levels cannot be maintained through redirecting noise sources (i.e., working in a different area) then noise insulation features would be installed (i.e., hay bails, plywood walls, etc.). Such sound noise insulation features would be installed between the sound source and the nest but be at least 20 meters from the nest itself.

MM BIO-7: Avian Protection. Transmission poles would be designed “avian-safe” in accordance with *Suggested Practices for Avian Protection on Power Lines: the State of the Art in 2006* (Avian Power Line Interaction Committee 2006).

Effect BIO-5: Introduction of the Invasive Argentine Ant.

The Applicant estimates that the panels will require washing once per year during the summer when power prices and, correspondingly, power production are highest. Panel washing will require between 10,000 to 20,000 gallons for Phase I and 12,000 to 25,000 gallons for Phase II (totaling between 22,500 to 45,000 gallons per year under Alternative 3).

The introduction of an artificial water source into the project area may provide suitable habitat for the Argentine ant (*Linepithema humile*), an invasive species in California typically associated with water sources. This species often displaces native ant species. In turn, imperil other species in the ecosystem, such as native plants that depend on native ants for seed dispersal, or lizards that depend on native ants for food. Implementation of MM BIO-8 would immediately detect the introduction and ensure the prevention of this invasive species the spreading throughout the project area and offsite.

MM BIO-8: Introduction of Argentine Ants. Monitoring of this species presence would continue throughout the life of the project and coincide with monitoring for invasive plant species. Water for cleaning solar panels would be discharged onsite to avoid creating suitable habitat offsite. If this species establishes itself onsite, the Applicant would consult with the BLM to develop eradication measures such as the use of pesticides or slow-acting poison.

Alternative 4: Modified Site Layout

Alternative 4 would have effects similar to those described for Alternative 3. Alternative 4 would provide a 100-foot vegetated corridor and an artificial supply of water from site drainage along Santa Fe Fire Road. Although Alternative 4 would provide increased habitat for wildlife, water and foraging opportunities would draw wildlife into an area of greater traffic and risk for mortality.

Alternative 5: Smaller Project

A complete description is provided under Alternative 5: Smaller Project, Section 4.6.2.2. Under this alternative, construction and operations and maintenance activities would cause similar direct and indirect effects as described under Alternative 3. However only 238 acres of the 433-acre ROW would be developed with solar arrays. This alternative would reduce the loss of wildlife habitat. MM BIO-1 through 8 would be applicable to this alternative.

4.6.3.3 Cumulative Effects

Impact Methodology

For the cumulative effects analysis, a CESA has been identified to specifically address the cumulative effects for wildlife. Cumulative effects can result from individually minor but collectively significant actions taken over time. Major past, present, and reasonably anticipated future land uses and disturbances in the area have been identified in Section 3.18 and include energy generation, military uses, commercial and residential developments, and roadway improvements. Dispersed recreation (including special motorized vehicle events), as well as residential and commercial development, also occur in parts of the CESAs.

Geographic Extent

The wildlife CESA and cumulative projects are defined in Table 3.18-1. The geographic extent for cumulative effects on wildlife is approximately 10 miles. This geographic extent includes the home range of the larger mammals known to occur in the region, such as the coyote (approximately 10 miles) and kit foxes (up to 2 miles).

Past, Present, and Reasonably Foreseeable Projects and Changes

Cumulative effects on wildlife may be caused by the following projects:

- Map ID No. 1 LSR Pisgah LLC—CACA 50704;
- Map ID No. 2 Solel Inc.—CACA 50150;
- Map ID No. 3 LSR Pisgah LLC—CACA 50706;
- Map ID No. 5 Chevron PV Geotesting Land Use Permit—CACA 05062;
- Map ID No. 7 Caltrans Camprock Rd./SR 247 Bridge and Road Realignment Right-of-Way;
- Map ID No. 9 PGE Cushenbury Natural Gas Line;
- Map ID No. SB-26 SPP to add a wood grinding storage and distribution;
- Map ID No. SB-29 CUP to establish an asphalt plant;
- Map ID No. SB-30 TPM 18506;
- Map ID No. SB-31 TPM 18452;
- Map ID No. SB-32 TPM 18018;
- Map ID No. SB-34 TPM 18531;
- Map ID No. SB-35 TPM 17919;
- Map ID No. SB-36 TPM 19099;

- Map ID No. SB-44 TPM 18691;
- Map ID No. SB-61 TPM 17569; and
- Map ID No. SB-62 TPM 18699.

Cumulative Impact Analysis

Existing projects, as identified under Section 4.6.2.3, have contributed to habitat loss in the CESA. However, desert scrub habitat covers hundreds of square miles in the region (see Figure 3.6-2). Given that most of the foreseeable projects involve development and construction, effects on wildlife would include habitat loss, avoidance behavior, and mortality from grading, construction or vehicle use. Mortality resulting from identified foreseeable projects and the project is not expected to substantively affect populations in the area because there are no site-restricted populations. Furthermore, it is unlikely that there would be a cumulative effect from avoidance behavior due to distances between the project, existing structures, and foreseeable projects. If any of the proposed large solar projects were to be constructed, varied construction schedules would alleviate the scale of construction disturbance at any one time. The proposed solar facility would be surrounded by open space in which wildlife could move freely and could avoid construction activities. Reduced overall habitat in a localized area could cause increased wildlife competition. Based on the impact indicators specified, the project would not contribute to a cumulatively adverse effect on wildlife.

Implementation of Alternatives 1 and 2 would not result in any activity at the site of the project, and therefore, these Alternatives would not contribute to cumulative effects to wildlife.

Alternatives 4 and 5 would have similar cumulative effects as Alternative 3, with a slightly less effect for Alt 4 than 3. However, since Alternative 5 would have a smaller footprint, its contribution to cumulative effects would be less than Alternative 3 and 4.

4.6.3.4 Residual Effects

No residual effects on wildlife would result from implementation of the project. Although 433 acres of native and disturbed wildlife habitat could be lost, the loss would not substantially alter or interfere with wildlife populations in the project area. Loss of habitat would not be considered to substantially interfere with wildlife movement. Monitoring for invasive species (MM BIO-2 and MM BIO-8), providing biological monitors (MM BIO-3) and education training addressing biological concerns (MM BIO-5), reducing available nest habitat (MM BIO-6), and implementing avian protective measures (MM BIO-7) would prevent or reduce the entire effects associated with Effect BIO-4. Residual effects resulting from the implementation of Alternatives 4 and 5 would be similar to those described under Alternative 3.

4.6.4 Special Status Species

4.6.4.1 Indicators

The impact indicators are the same for all biological resource types addressed (vegetation, wildlife, and special status species), as outlined in Section 4.6.1.

4.6.4.2 Direct and Indirect Effects by Alternative

Effects on special status species that could result from the implementation of the alternatives during construction, operations and maintenance, or decommissioning activities associated with either Phase I or II are analyzed in this section.

Alternative 1: No Action/No Plan Amendment

Under NEPA, the BLM must consider an alternative that assesses effects that would occur if the project were not approved and the application were rejected. The No Action Alternative assumes that the ROW application is denied and the CDCA Plan is not amended. Under this alternative, there would be no construction and the project site would not be disturbed, thus there would be no project-related effects on special status species. The site would continue to be managed under the current CDCA Plan.

Alternative 2: Land Use Plan Amendment

Alternative 2 would deny the ROW application, but the CDCA Plan would be amended to designate the site of the project as either suitable or unsuitable for large-scale solar development. Under this alternative, there would be no construction and the project site would not be disturbed, thus there would be no project-related effects on special status species.

Alternative 3: Proposed Action

Under Alternative 3, construction, operations, and maintenance activities would cause the following adverse effects:

Effect BIO-6: Loss of special status plants or habitat for special status plant species.

Grubbing/scarifying and grading would directly remove special status plants from the area, would cause temporary and permanent soil disturbance that would impede future use by special status plants, and would denude the area of seed banks for those species. The Proposed Action would also directly remove approximately 433 acres of creosote bush-white bursage, white bursage, and/or desert wash communities that are associated with special status plants. Dust generation from construction activities could cause the indirect loss of plants by covering the leaves and thereby impairing photosynthetic activity.

Construction activities, ongoing maintenance, including vegetation clearing, and the frequent use of vehicles on-site during both construction and operations could introduce invasive and noxious weeds to the site. Once these weeds become established, they proliferate very quickly and can out-compete native special status plants. The habitat can become monotypical, thereby reducing quality and diversity for wildlife dependent on native habitat. There are 12 special status plants with potential to occur on the site. None of these plants were found on-site during surveys. And while 10 of these special status plants are not present under current conditions, two (white pygmy poppy and Little San Bernardino Mountains linanthus) may occur in the Proposed Action area and could be adversely affected by the Proposed Action. Adverse effects on special status plants would be both short- and long-term.

Overall, the adverse effects under Alternative 3 could include direct mortality, loss or injury of special status plants, loss of their habitat, alteration of their community structure, and community fragmentation, while dust during construction could indirectly decrease photosynthesis. These effects would be both short- and long-term in nature and predominantly limited to the site of the Proposed Action, with the exception of edge effects at the perimeter of

the site. Implementation of MM BIO-1 through MM BIO-5 would reduce effects on special status plant communities.

Effect BIO-7: Loss of special status wildlife or habitat for special status wildlife species.

Clearing and grading activities, construction, and vehicle use during construction and operation and maintenance are all sources of direct mortality to wildlife species. Collisions with equipment and vehicles can occur for slower-moving species, species that have subsurface burrows, or ground-nesting birds. Some species are very susceptible to visual and noise disturbances caused by the presence of humans, construction equipment, and generated dust. Nesting birds may abandon nests due to these disturbances, and bats are also susceptible. Grading and grubbing activities could indirectly affect special status wildlife through habitat loss such as the removal and/or modification of 433 acres of creosote bush-white bursage, white bursage, and desert wash communities. These vegetation communities provide forage, shelter, and nesting opportunities for many special status wildlife. The presence of infrastructure may indirectly cause mortality to wildlife by increasing the risk of predation on certain species by native predators, such as ravens, and introduced predators, such as feral dogs and cats. Effects on special status wildlife would be short- and long-term, and both localized and extensive.

Le Conte's thrasher, northern harrier, and prairie falcon have been observed on the site and may be adversely affected by the Proposed Action. These species use the area for foraging and, in the case of the thrasher, potentially for nesting. These birds would be susceptible to visual and noise disturbance as described above, potentially resulting in alteration of foraging behaviors to avoid the site. This would cause avoidance of suitable habitat and energetic costs to locate other suitable habitat in the area around the Proposed Action. While the harrier and falcon can likely forage elsewhere, the thrasher may be at higher risk from the Proposed Action if the species is using the vegetation on-site to nest. The thrasher nests low to the ground in dense shrubs and cacti species and could lose nests directly due to collisions and clearing and grading activities. The thrasher could also abandon its nests due to disturbance. Removal of vegetation from the site would remove forage habitat for the northern harrier and prairie falcon and nesting and forage habitat for the Le Conte's thrasher, resulting in direct, short- and long-term loss of food and shelter for the birds.

Suitable habitat exists on the site for burrowing owl, and this species was observed in the area in the past. If owls are present on the site during construction, they may not be able to move quickly enough to avoid mortality due to collisions with vehicles and equipment or collapse of burrows during clearing and grading. Increased vehicle use on the site during operation and maintenance could also increase collisions and mortality of the burrowing owl on-site.

Visual and noise disturbances could trigger habitat avoidance behavior that could alter successful foraging and nesting for individuals in the area. Permanent loss of foraging and nesting habitat resulting from construction would also adversely affect the owl by reducing available suitable habitat within its range.

Three special status mammal species were not observed within the Proposed Action area during field surveys. These are the western mastiff bat (*Eumops perotis*), Mohave ground squirrel, and pallid San Diego pocket mouse (*Chaetodipus fallax fallax*). The Proposed Action would remove potential habitat used by these species; therefore, they would be adversely affected. With implementation of MM BIO-2 through MM BIO-7, and consultation with state agencies (MM BIO-9), adverse effects on special status wildlife or their habitat in the Proposed Action area would be avoided.

MM BIO-9: Consultation about Burrowing Owl. The Applicant would coordinate with CDFG about implementation of MM BIO-7 (Preconstruction Nest Surveys) for burrowing owls.

Effect BIO-8: Loss of desert tortoise or loss of habitat for desert tortoise.

Desert tortoises is present on-site and would be adversely affected by the Proposed Action. Effects would be both short- and long-term. The Proposed Action activities could potentially extend to areas outside the boundary of the Proposed Action. For example, the tortoise could be susceptible to mortality from collisions with vehicles entering and leaving the site and project construction could impact partial home ranges which currently overlap with the project footprint.

The tortoise is a slow-moving animal that uses subsurface and hillside burrows in loose, gravelly soils. It is known to burrow in the soft shoulder of dirt and gravel roads. Desert tortoise was observed in the area, and burrows were located on and in proximity to the site. The tortoise could be susceptible to mortality from the inadvertent ingestion of hazardous chemicals leaking from vehicles and equipment, herbicides, and soil binders.

Clearing of the site could potentially introduce feral dogs that could harass, injure, or kill desert tortoises. Similarly, construction of the exterior fence for the site could increase the presence of natural predators by providing perching locations for predatory ravens, which are a leading source of mortality for the tortoise. Fencing of the site would also adversely affect the tortoise by potentially impeding and altering breeding migrations. Vibrations from heavy equipment could cause burrows to collapse, resulting in either direct mortality to tortoise present in the burrows or indirect loss of habitat. Both of these adverse effects would be localized.

Making new burrows would require heavy energetic expenditure for the animals and could leave them exposed prior to reconstruction of burrows. This situation could lead to stress and eventual death of animals. Stressed tortoises void their bladders frequently, resulting in an increased risk of dehydration. Tortoises under stress are also at increased risk of contracting and transmitting upper respiratory tract diseases.

Construction and mechanical soil disturbance would adversely affect tortoise habitat on-site by encouraging the spread of invasive plant species. Invasive weeds, especially Sahara mustard, have low or no nutrition value for this reptile; thus, proliferating weed species throughout the Proposed Action area could indirectly result in loss of high quality forage habitat. Direct removal of succulent plant species would likewise remove available forage. The Applicant has completed consultation with the USFWS and CDFG, and a Biological Opinion (BO) has been issued by the USFWS (See Appendix K). All terms and conditions associated with these consultations would be implemented. Construction of the Proposed Action would require the relocation of desert tortoise occupying the site. While all precautions will be taken, including BMs onsite at all times during construction to handle desert tortoises, relocation of tortoise could lead to the injury or death of individuals. To reduce the impact of Effect BIO-8 and ensure continued protection of this species throughout the life of the Proposed Action, MM BIO-10 and MM BIO-11 would also be implemented. Furthermore, the Applicant would supplement the loss of habitat off-site under MM BIO-12.

MM BIO-10: Desert Tortoise Exclusion Fence. A tortoise exclusion fence would be installed around the Proposed Action area (encompassing the 516-acre site) before earth disturbing activities begin. Since the project would be phased, the installation of the tortoise exclusion fencing would also be

Until the exclusion fence is complete, the BM would conduct preconstruction clearance surveys for desert tortoises within 48 hours prior to the start of any ground-disturbing activity. The BM would follow the guidance in the field manual (Service 2009) when handling desert tortoises and their eggs during examination, excavating burrows, and constructing artificial burrows. Work area boundaries would be delimited with flagging or other marking to minimize surface disturbance associated with vehicle straying. Project personnel would use previously disturbed areas to the extent feasible. Special habitat features, such as burrows and drinking sites identified by the BM, would be avoided to the extent possible. Discovered burrows would be checked for desert tortoises and eggs. If desert tortoises or eggs are found, the burrows would be flagged so that equipment operators and drivers would clearly see the flagging and avoid the burrows. Unoccupied burrows would be flagged in a manner that contrasts with occupied burrows.

The fence would be constructed of ½-inch mesh hardware cloth. It would extend 18 inches above ground and 12 inches below ground. Where burial of the fence is not possible, the lower 12 inches would be folded outward against the ground and fastened to the ground so as to prevent desert tortoise entry. The fence would be supported sufficiently to maintain its integrity. Provisions would be made for closing off the fence at the point of vehicle entry or the installation of cattle guards. Placement and erection of the fencing would be approved and inspected by a BM. Bird perching deterrents would be installed as part of the fence construction.

After fence installation (within 30 days), the BM would conduct a 100 percent coverage protocol survey for desert tortoises within the fenced area. This survey would be conducted during the spring (April and May) or fall (late August through mid-October) at times conducive to desert tortoise activity. All desert tortoises found would be marked and removed from the enclosure outside the nearest fence onto land managed by BLM. (Desert tortoises would not be moved onto private land.) Clearance surveys would be complete when no additional desert tortoises are detected during two consecutive sweeps of the site. The area would be considered cleared of desert tortoises unless a breach in the fence occurs. Guidelines provided by the USFWS (Service 2009) pertaining to clearance surveys and procedures for marking, handling, and relocating individuals would be used.

CES would inspect the desert tortoise exclusion fence (permanent and temporary) during construction and operation of the project on a regular basis sufficient to maintain an effective barrier to movement. Inspections would be documented in writing and include any observations of entrapped animals, repairs needed, desert tortoises, their burrows, and carcasses; and recommendations for supplies and equipment needed to complete repairs and maintenance. Fences would be inspected monthly and after each significant precipitation event, throughout the life of the project. GPS coordinates of problem areas, such as those prone to washing out and vandalism would be recorded. All fence repairs would take place within 7 days of detection. If fence repairs would require the use of mechanized equipment or vehicles, all vehicles would access the damaged fence area from within the right-of-way. Only foot traffic will occur outside the right-of-way to repair fences, to minimize disturbance to desert tortoise habitat. A BM would accompany any fence repair crews to prevent impacts to desert tortoises. If a breach in the fencing last more than 7 days, CES would contact the BLM immediately; additional clearance surveys of the interior may be required at the discretion of BLM, based on the likelihood of desert tortoises entering the facility. Fence maintenance activities would be summarized in the reports submitted by the BM to the resource agencies (see BIO-3).

MM BIO-11: Desert Tortoise Protective Measures. Desert tortoise protective measures would be implemented during construction activities and during operations and maintenance activities, as set forth within the USFWS BO (Appendix K). These protective measures would comprehensively minimize take of desert tortoise. These protective measures would include, but would not be limited to:

- If desert tortoises are detected during any survey, the BM would relocate the tortoises outside the Project ROW fence within 1,000 feet of the point of capture;
- Desert tortoises would only be handled when necessary;
- Until construction of the exclusion fence would be complete and for vehicles working outside of the fenced area at any time, vehicles or equipment would be inspected for desert tortoises underneath before moving them. If a desert tortoise is encountered, project personnel would contact a BM. The desert tortoise would be allowed to move a safe distance away on its own accord, prior to moving the vehicle. Alternatively, a BM may move the desert tortoise to a safe location to allow for movement of the vehicle.
- Project construction, operation, and maintenance activities would be confined to the project right-of-way and approved access roads. The only exception would be to connect the proposed distribution line and fiber-optic line to the existing power lines along Foothill Road. Except under emergency conditions, any disturbance outside the project right-of-way would not take place until CES receives written authorization from the BLM.
- A construction monitoring team, which will include an appropriate number of BMs, would be present during connection of the distribution line between the solar field and Southern California Edison's existing line and the installation of the entire length of the fiber-optic line. The BMs would ensure that desert tortoises are not injured or killed during this phase of the project by implementing appropriate protective measures, such as conducting a survey directly before activity begins, flagging any burrow or drinking site in the vicinity that potentially could be affected by the activity, and ensuring desert tortoises have not taken shelter underneath vehicles or equipment before moving them.
- Areas used for stockpiles, vehicle turn-around, service of vehicles, and storage of equipment and material would be restricted to the project right-of-way within the desert tortoise exclusion fence. Leftover excavated material would not be left in place, but would be disposed of in designated areas and in a manner approved by the BLM.
- CES would prohibit project personnel from driving off road or performing ground-disturbing activities outside of designated areas during construction, operation, or maintenance, except to deal with emergencies.
- To reduce the potential for vehicle strikes of desert tortoises on unfenced access roads (i.e., Santa Fe Fire Road and Foothill Road) during construction, CES would temporarily fence them with exclusion fencing prior to the onset of construction. During construction, operation, and maintenance of the proposed project, vehicle speeds would not exceed 20 miles per hour within the right-of-way or on unpaved roads.
- Firearms and domestic dogs would be prohibited from work areas and the proposed project site. Trash and food items will be disposed of promptly in predator-proof containers with re-sealable lids.

- Trash containers would be inspected at the end of each work day and would regularly be removed from the project site to reduce the attractiveness of the area to common ravens (*Corvus corax*) and other desert tortoise predators.
- Encounters with desert tortoises would be immediately reported to the BM. The BM would maintain records of all desert tortoises encountered during construction, operation and maintenance activities. Information recorded would include: the location (narrative, vegetation type, and maps); date of observation; location of damaged area of fence, if any; general condition of health and apparent injuries and state of healing; if moved, location moved from and to and whether the desert tortoise voided its bladder; digital photographs of each handled desert tortoise; and diagnostic markings (i.e., identification numbers, marked lateral scutes).
- Upon locating injured or dead desert tortoises, CES would notify the BLM and USFWS immediately. Written notification would be made within 72 hours of the date and time of finding or incident, and would include location, a photograph, cause of death or injury (if known), and other pertinent information. Carcasses would be left in place (or just outside of the constructed fence or project footprint). Desert tortoises injured through CES activities would be transported to a veterinarian for treatment at the expense of CES and, if the animal recovers, the USFWS would be contacted to determine its final disposition.
- In an emergency, a desert tortoise monitor would evaluate the site and, if required, monitor the activities. If desert tortoises must be handled, a BM or desert tortoise monitor given approval by the BM would conduct these activities. If a BM cannot reach the site in time to conduct the emergency activity, CES personnel may handle the desert tortoise only after specific approval from the BLM, USFWS or CDFG.
- CES would smooth out ephemeral drainages and create swales that would allow the movement of water to cross the site and allow sheet drainage at the far north end of the site. Laydown areas would be located at least 100 feet away from drainages. No refueling, equipment repair, or lubrication activities would be allowed within 100 feet of the drainages. Proper spill containment materials to isolate potential spills would be used.
- All leaks, spills, or releases of fuel or other hazardous materials would be reported immediately to the BLM. All material that leaks, spills, or is otherwise released into habitat of the desert tortoise would be removed immediately. The BM would ensure all appropriate measures, including those proposed by CES and the biological opinion's terms and conditions would be implemented during the removal of the hazardous materials.
- All road killed animals would be reported to the BM and removed from the site.

Appendix K, *Biological Opinion for the Chevron Solar Project Site Lucerne Valley, California*, has further information about the protective measures. If there is a conflict between the protective measures outlined in this EIS and the BO, the measures in the BO would govern.

If a dead or injured desert tortoise is located, the Applicant would notify the BLM within three business days. The BLM must then notify the Ventura USFWS office of the incident within three business days. The information provided must include the date and time of the finding or incident (if known), location of the carcass, a photograph, cause of death, if known, and other pertinent information. Desert tortoise remains would be left in place (or just outside of

the construction footprint or fenced area). Injured animals would be transported to a qualified veterinarian by the authorized biologist for treatment at the expense of the Applicant. If an injured animal recovers, the USFWS would be contacted for final disposition of the animal.

MM BIO-12: Raven Management. Construction and operation of the Proposed Action could attract common ravens (*Corvus corax*), which are primary predators of desert tortoises. To be in compliance with the CDCA Plan and its amendments, all new projects with the potential to increase ravens must develop and implement raven management plans.

To minimize the proposed project's impacts on desert tortoises from increased predation by common ravens, CES would develop a site-specific management plan with the goal of ensuring that the project does not attract common ravens or provide subsidies during all phases of development and use, including construction, operation and maintenance, and decommissioning. This plan must be approved by the USFWS, BLM, and CDFG prior to the initiation of any habitat disturbing activities. The management plan would: identify conditions associated with the project that might provide subsidies or attractants to common ravens; describe management practices to avoid or minimize conditions that might increase the numbers and predatory activities of common ravens; describe control practices for common ravens; address monitoring and nest removal during construction and for the life of the project; and discuss reporting requirements.

To mitigate for this proposed project's portion of the cumulative and indirect effect of increasing the population of common ravens in the desert region, CDFG has required that a fee would be collected to contribute to an account established with the National Fish and Wildlife Foundation (NFWF) to implement a regional management plan for common ravens that will implement recommendations in the environmental assessment for the reduction of predation by the common raven on the desert tortoise in the California desert (Service 2008). The account was established by the BLM, CDFG, USFWS, Californian Energy Commission, and NFWF would manage the funds that will be used to implement the regional management plan. The environmental assessment identifies several activities to reduce predation by common ravens on desert tortoises, including reduction of human-provided subsidies (e.g., food, water, sheltering and nesting sites), education and outreach, the removal of common ravens and their nests, and evaluation of effectiveness and adaptive management. The fee for cumulative and indirect effects is part of the CDFG requirements for its consistency determination. The payment would be made prior to any ground-disturbing activities being authorized.

MM BIO-13: Desert Tortoise Off-Site Mitigation. All loss of desert tortoise habitat shall be off-set consistent with the requirements of the WEMO Plan, wildlife agency permits, and the USFWS's BO. The Applicant would coordinate with the BLM to develop off-site mitigation to compensate for effects on desert tortoises and their habitat by funding desert tortoise habitat acquisition and enhancement activities on other lands. This off-site mitigation is supplemental to MM BIO-10 and MM BIO-11.

The compensation that the BLM described in the Biological Assessment has changed as a result of discussions among the agencies since the beginning of consultation. Consequently, the following description represents the current requirements by the BLM and California Department of Fish and Game.

Both the BLM and the CDFG would require CES to compensate for the loss of habitat. According to the provisions of the amended CDCA Plan (Bureau et al. 2005), the BLM would require compensation at the rate of one to one. To meet its "fully mitigated" standard

under the CESA, the CDFG requires a compensation ratio of two to one. Because the CDFG has agreed to accept the BLM's one to one ratio as part of its two to one requirement, the total compensation ratio would be two to one.

For the BLM's portion of the compensation, the Applicant would deposit funds based on the price to acquire land (i.e. funding sufficient to acquire 516 acres) into an account managed by the National Fish and Wildlife Foundation. These funds would be used to enhance desert tortoise habitat within the Ord-Rodman Desert Wildlife Management Area. This one to one component of the total compensatory mitigation could be provided in fee to the BLM based on the July 13, 2010 Renewable Energy Action Team (REAT) fee Schedule. The REAT – National Fish and Wildlife Foundation's Memorandum of Agreement allows for the REAT agencies to require additional funding to be deposited into the project specific account if they find that the money is not adequate to implement the required biological mitigation. Habitat enhancement actions for this project could include all or some of the following: construction of a fence along State Route 247 from Barstow to Lucerne Valley to prevent desert tortoise from entering the roadway with the primary focus area being Barstow to Stoddard Ridge; signing open routes within the Ord-Rodman Desert Wildlife Management Area and visually obscuring routes that have been administratively closed but continue to be used by vehicles; and installation of barrier fencing in the Stoddard Valley area to prevent unauthorized use of the Desert Wildlife Management Areas. These funds may also be used to support a headstarting program for desert tortoises that would be developed in coordination with the USFWS's Desert Tortoise Recovery Office.

The portion of the compensation required by the CDFG would be used to acquire 516 acres of desert tortoise habitat in the Ord-Rodman, Superior-Cronese, or Fremont-Kramer Desert Wildlife Management Areas. This acquisition can be done by CES and donated to the BLM or CES can deposit sufficient funds for this acquisition, as determined by CDFG, into the National Fish and Wildlife Foundation account for the National Fish and Wildlife Foundation to then contract the purchase of these lands.

Effect BIO-9: Effects on bird species protected by the Migratory Bird Treaty Act, the Bald Eagle and Golden Eagle Act, and California Fish and Game Code.

The Proposed Action could result in direct or indirect effects on birds protected by the Migratory Bird Treaty Act, including northern harrier, prairie falcon, golden eagle, red-tailed hawk, and any other migratory bird species. If vegetation clearing is conducted during the avian breeding season, active nests could be destroyed. Alteration of foraging behaviors due to on-site disturbances may also cause avoidance of suitable habitat. This would have energetic costs and would indirectly contribute to stress and mortality of these birds. The presence of Proposed Action infrastructure may increase collision mortalities. Alteration of the prey base and loss of prey to increased mortality from construction activities may decrease raptor foraging success. Again, reduction in prey could indirectly contribute to stress and mortality of these predatory birds.

An eagle survey was conducted for the project area during June 2010 (Appendix L). Fourteen golden eagle nest locations were identified during the survey efforts; 11 inactive nests and three active nests. The nearest active nest was approximately 5.5 miles south of the Proposed Action area, in the Blackhawk Mountain Range (Chambers Group 2010). No golden eagle nesting habitat is present on the Proposed Action site and no golden eagles were observed on the Proposed Action site. However, there are four territories within 10 miles of the Proposed Action boundary. Two of these territories are historic and were vacant when surveyed in 2008; two

territories were occupied in 2008. Two active territories were observed approximately 3.5, 5.5, and 4.5 miles from the Proposed Action boundary (WRI 2008).

The Proposed Action is within a reasonable foraging distance from these active territories, and the habitat is considered potential foraging habitat for golden eagles. This is far enough away that constructing, maintaining, or operating the project should not disturb the nesting eagles. Although studies are currently in progress, the home range size for golden eagles in arid habitats is unknown. Golden eagles have been demonstrated to forage primarily within 4 miles of the center of their territories in mesic environments (McGrady et al. 2002), but this distance may be longer in xeric habitats, up to 10 miles (Bittner, pers com). Although the Proposed Action site may provide foraging habitat for golden eagles, losing foraging habitat of the size of the Proposed Action (516 acres) would account for a small portion of their hunting range (approximately 5 percent) and would not be considered large enough to affect the breeding success of these eagles. Additionally, the active territories are far enough away from the Proposed Action boundary (approximately 3.5 and 4.5 miles) that constructing, maintaining, or operating the Proposed Action would not disturb nesting eagles (Appendix L).

Adverse effects on other bird species or habitat loss would be localized over the short-term with the implementation of MM BIO-1, MM BIO-2, MM BIO-4, MM BIO-6, and MM BIO-7.

Alternative 4: Modified Site Layout

Alternative 4 would have similar effects on special status species as those described for Alternative 3. The effects during Phases I and II under Alternative 4 would be similar to those identified under Alternative 3. Both Alternative 3 and 4 have identical construction durations, and the difference between the total areas graded, grubbed/scarified, and developed is 4.4 acres less for Alternative 4 compared to Alternative 3. In addition, the proposed energy generation for both alternatives would be the same at 45 MW. Alternative 4 would provide a 100-foot vegetative setback and an artificial supply of water from site drainage along Santa Fe Fire Road. Although Alternative 4 would provide increased habitat for wildlife, water and foraging opportunities would draw wildlife into an area of greater traffic and risk for mortality. This would be particularly relevant for desert tortoise, nesting and foraging birds, and foraging raptors.

MM BIO-1 through MM BIO-13 would be necessary to reduce effects from implementation of Alternative 4.

Alternative 5: Smaller Project

A complete description is provided under the Alternative 5: Smaller Project in Section 4.6.2.2. Under this alternative, construction and operations and maintenance activities would cause similar direct and indirect effects as described under Alternative 3. However, only 238 acres of the 516-acre ROW would be developed with solar arrays. This alternative would reduce the potential effects on special status species compared to Alternative 3. MM BIO-1 through MM BIO-13 would be necessary to reduce effects from implementation of Alternative 5.

4.6.4.3 Cumulative Effects

Impact Methodology

For the cumulative effects analysis, a CESA has been identified to specifically address the cumulative effects for special status species. Cumulative effects can result from individually minor but collectively significant actions taken over time. Major past, present, and reasonably

anticipated future land uses and disturbances in the area have been identified in Section 3.18, and include energy generation, military uses, commercial and residential developments, and roadway improvements. Dispersed recreation (including special motorized vehicle events), as well as residential and commercial development, also occur in parts of the CESAs.

Geographic Extent

The geographic extent for the CESA for special status species is an approximately 6-mile radius from the project site. This geographic extent encompasses special status vegetation (similar to that described in Section 4.6.2.3), the relatively small home ranges of ground-dwelling species, such as the desert tortoise (less than a mile) and burrowing owls (approximately 2 miles), and avian species, such as LeConte's thrasher (on average, approximately 40 acres). Existing projects, as identified under Section 4.6.2.3, have contributed to habitat loss in the CESA.

Past, Present, and Reasonably Foreseeable Projects and Changes

Cumulative effects on special status species may be caused by the following projects:

- Map ID No. 1 LSR Pisgah LLC—CACA 50704;
- Map ID No. 2 Solel Inc.—CACA 50150;
- Map ID No. 3 LSR Pisgah LLC—CACA 50706;
- Map ID No. 5 Chevron PV Geotesting Land Use Permit—CACA 05062;
- Map ID No. 7 Caltrans Camprock Rd./SR 247 Bridge and Road Realignment Right-of-Way;
- Map ID No. 9 PGE Cushenbury Natural Gas Line;
- Map ID No. SB-26 SPP to add a wood grinding storage and distribution;
- Map ID No. SB-29 CUP to establish an asphalt plant;
- Map ID No. SB-30 TPM 18506;
- Map ID No. SB-31 TPM 18452;
- Map ID No. SB-32 TPM 18018;
- Map ID No. SB-34 TPM 18531;
- Map ID No. SB-35 TPM 17919;
- Map ID No. SB-36 TPM 19099;
- Map ID No. SB-44 TPM 18691;
- Map ID No. SB-61 TPM 17569; and
- Map ID No. SB-62 TPM 18699.

Cumulative Impact Analysis

Effects on special status species from these projects would likely include soil disturbance; introduction or spread of non-native or noxious plant species; wildlife mortality from grading, construction, or vehicle use; avoidance behavior; and some habitat loss. Potential mortality from the foreseeable projects and the project would not be expected to substantively affect special status populations in the area. For desert tortoise, no critical habitat is present within 6 miles of

the project location, and thus, there would be no cumulative loss of that habitat. Desert tortoise would, however, be permanently excluded from the entire 516 acre site as a result of the installation of the exclusion fence (per MM BIO-10). Therefore, the construction of the solar facility would represent a loss of 516 acres of suitable desert tortoise habitat. It is unlikely that there would be a cumulative effect from avoidance behavior due to distances between projects and varied construction schedules. Animals can move within open spaces surrounding and between these projects. Reduced overall habitat in the general area may cause increased competition. These effects would be adverse and long-term and could alter special status species population abundances, but are not expected to cause an actionable cumulative effect, such as potential extirpation or change in status.

The local area for a golden eagle population is defined by the natal dispersal for golden eagles, which is 140 miles. The natural dispersal distance is used to determine if an eaglet is produced on territories that are up to 140 miles from the project and thus could disperse into the project area and might be affected by the project. It is also used to determine if eaglets produced on territories close to the project can find suitable territories when they disperse from their natal territory. Since the project does not affect local eagle territories, it does not add to the cumulative effects on golden eagles in the area. The project, due to its small size, would not significantly contribute to decreased habitat for eagles.

Implementation of Alternatives 1 and 2 would not result in any activity at the site of the project, and therefore, these Alternatives would not contribute to cumulative effects to special status species.

Alternative 4 would have a similar cumulative effect as Alternative 3. Because Alternative 5 would have a smaller footprint, its contribution to cumulative effects would be less than Alternative 3.

4.6.4.4 Residual Effects

Residual effects would occur as a result of implementing Alternative 3. The project site covers 516 acres, and of this area, nearly 85 percent (433 acres) would be graded or grubbed/scarified. In addition, the entire 516-acre area would be fenced. This would substantially effect special status species habitat and would alter or interfere with special status wildlife and plant populations in the project area over the long-term. Minimizing effects on vegetation (MM BIO-1); managing invasive species (MM BIO-2 and MM BIO-8); providing biological monitors (MM BIO-3), BMPs (MM BIO-4), educating workers of the onsite biological concerns (MM BIO-5); conducting preconstruction nest surveys (MM BIO-6); implementing avian protective measures (MM BIO-7); consulting agencies (MM BIO-9) implementing on-site protective measures (MM BIO-10, MM BIO-11, and MM BIO-12), and acquiring off-site habitat (MM BIO-13) would prevent or reduce the entire effects associated with Effects BIO-5 through BIO-8. Residual effects resulting from the implementation of Alternatives 4 and 5 would be similar to those described under Alternative 3.

4.7 Cultural Resources

This section discusses effects on cultural resources that may occur with implementation of the Proposed Action or alternatives. First, the indicators used to identify and analyze effects are presented; second, potential effects are discussed, and agency recommended mitigation measures are presented; third, a discussion of residual and cumulative effects is provided.

4.7.1 Indicators

In general, the project could affect cultural resources by either directly or indirectly altering the characteristics of a historic property that is eligible for inclusion or listed in the National Register of Historic Places (NRHP) per 36 CFR, Part 800.5. The project would adversely affect historic properties if it would:

- Physically destroy or damage all or part of the property;
- Alter a property, by restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the Secretary of the Interior's standards for the treatment of historic properties (36 CFR, Part 68) and applicable guidelines;
- Remove the property from its historic location;
- Change the character of the property's use or of physical features within the property's setting that contribute to its historic significance;
- Introduce visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;
- Neglect a property, which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; or
- Transfer, lease, or sell a property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

4.7.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. All effects discussed in this section are direct; no indirect effects were identified for this resource area.

4.7.2.1 Alternative 1: No Action/No Plan Amendment

Under NEPA, the BLM must consider an alternative that assesses effects that would occur if the project were not approved and the application were rejected. The No Action Alternative assumes that the ROW application is denied and the CDCA Plan is not amended. Under this alternative, there would be no construction and the project site would not be disturbed, thus there would be no effect on cultural resources.

4.7.2.2 Alternative 2: Land Use Plan Amendment

Alternative 2 would deny the ROW application, but the CDCA Plan would be amended to classify the site of the project as either suitable or unsuitable for large-scale solar development. Under this alternative, there would be no construction and the project site would not be disturbed, thus there would be no effect on cultural resources.

4.7.2.3 Alternative 3: Proposed Action

Effects that could result from the implementation of Alternative 3 during construction, operations and maintenance, or decommissioning activities associated with either Phase I or II are analyzed in this section.

Construction (Phases I and II)

Phases I and II of the Proposed Action would include preconstruction survey activities consisting of staking/flagging, clearing, and earthwork. The earthwork activities include approximately 12.5 acres of grading or developing for the 0.003 acre for the switchyard, the 0.006 acre for the operation and maintenance building, 7 acres for the access road, 5 acres for the power line, and 0.5 acre for the parking/lay down area. Another 420 acres would be grubbed or scarified for solar panel installation. Disturbance associated with installation of a 33-kV overhead distribution line, T1 data line, and power poles within the project ROW during Phase I is included in the power line disturbance, as noted above.

No cultural resources eligible for inclusion in the NRHP are known to occur in the Proposed Action area, in the proposed locations for temporary access roads, or within a one-mile radius of the site perimeter (Chambers Group 2009).

Effect CULT-1: Adverse effect on historic resources.

The Proposed Action could violate cultural resource standards, could cause an adverse change in the significance of a historic property or archaeological resource, or could disturb human remains. Construction of the Proposed Action would involve ground disturbance, resulting in potentially adverse effects on previously unidentified surface and subsurface cultural resources, including human remains. Evaluations of sites identified during the BLM Class III inventory (Chambers Group 2009) against NRHP criteria concluded there is no evidence of intact deposits of subsurface cultural material; however, this does not preclude the potential for an unanticipated discovery during construction activities. With the implementation of MM CULT-1, Alternative 3 would result in no adverse effect on cultural resources.

MM CULT-1: Addressing Unanticipated Discoveries. Prior to any construction activity in both Phase I and II, the Applicant would implement actions to address the unanticipated discovery of cultural resources. The actions (herein referred to as “features”) would limit potential adverse effects on cultural resources occurring during construction, operations and maintenance, and decommissioning of Phase I and Phase II of the Proposed Action. Specifically, the features would ensure that the requirements of Section 106 of the NHPA and National Programmatic Agreement and other applicable laws, policies, and regulations governing cultural resources are followed in the event cultural resources are discovered during construction of the Proposed Action. All construction shall stop in the immediate area and the BLM archaeologist at the Barstow Field Office be contacted immediately and the

BLM Barstow Field Office who would determine the appropriate management actions to be taken.

Protocol for Discovery of Human Remains in California

All discovered human remains shall be treated with respect and dignity. California state law (California Health & Safety Code 7050.5) and federal law and regulations ([Archaeological Resources Protection Act (ARPA) 16 USC 470 & 43 CFR 7], [Native American Graves Protection & Repatriation Act (NAGPRA) 25 USC 3001 & 43 CFR 10] and [Public Lands, Interior 43 CFR 8365.1-7]) require a defined protocol if human remains are discovered in the state of California regardless if the remains are modern or archaeological.

Upon discovery of human remains in California, all work in the area must cease immediately, nothing disturbed and the area is to be secured. The County Coroner's Office of the county where the remains were located must be called. The Coroner has two working days to examine the remains after notification. The appropriate land manager/owner or the site shall also be called and informed of the discovery.

If the remains are located on federal lands, federal land managers/federal law enforcement/federal archaeologist are to be informed as well because of complementary jurisdiction issues. It is very important that the suspected remains and the area around them remain undisturbed and the proper authorities called to the scene as soon as possible as it could be a crime scene.

The Coroner will determine if the bones are historic/archaeological or a modern legal case.

Modern Remains

If the Coroner's Office determines the remains are of modern origin, the appropriate law enforcement officials will be called by the Coroner and conduct the required procedures. Work will not resume until law enforcement has released the area.

Archaeological Remains

If the remains are determined to be archaeological in origin and there is no legal question, the protocol changes depending on whether the discovery site is located on federally or non-federally owned/managed lands.

Remains discovered on federally owned/managed lands

After the Coroner has determined the remains are archaeological or historic and there is no legal question, the appropriate Field Office Archaeologist must be called. The archaeologist will initiate the proper procedures under ARPA and/or NAGPRA. If the remains can be determined to be Native American, the steps as outlined in NAGPRA, 43 CFR 10.6 *Inadvertent discoveries*, must be followed.

Remains discovered on non-Federally owned/managed lands

After the Coroner has determined the remains on non-federally owned/managed lands are archaeological and there is no legal question, the Coroner will make recommendations concerning the treatment and disposition of the remains to the person responsible for the excavation, or to his or her authorized representative. If the Coroner believes the remains to be those of a Native American he/she shall contact by telephone within 24 hours, the California

Native American Heritage Commission (NAHC). The NAHC will immediately notify the person it believes to be the most likely descendant of the remains. The most likely descendant has 48 hours to make recommendations to the land owner for treatment or disposition of the human remains. If the descendant does not make recommendations within 48 hours, the land owner shall reinter the remains in an area of the property secure from further disturbance. If the land owner does not accept the descendant's recommendations, the owner or the descendants may request mediation by the NAHC.

Operations and Maintenance (Phases I and II)

Operation of the Proposed Action would primarily be automated. Maintenance activities associated with the Proposed Action would include panel washing and inverter inspection, vegetation control as necessary and routine inspection of switchgear. In the event that cultural resources are identified during operations or maintenance activities, implementation of MM CULT-1 would ensure that there are no adverse effects.

Decommissioning

The expected life of the Proposed Action is 30 years. Should the site of the Proposed Action be decommissioned, all equipment, buildings, concrete foundations, and driven piles would be removed. Consistent with BLM requirements, a detailed decommissioning plan would be developed in a manner that both protects public health and safety and is environmentally acceptable. In the event that cultural resources are identified during decommissioning activities, implementation of MM CULT-1 would ensure that there are no adverse effects. In addition to implementation of MM CULT-1, the Applicant would comply with any new regulations pertaining to cultural resources that are in effect at the time of decommissioning.

4.7.2.4 Alternative 4: Modified Site Layout

Alternative 4 would reduce effects on visual resources and water use with a setback from Santa Fe Fire Road. The setback between the project perimeter fence and Santa Fe Fire Road would be increased to 50 feet. The effects during Phases I and II under Alternative 4 would be similar to those identified under Alternative 3. Both Alternative 3 and 4 have identical construction durations, and the difference between the total areas graded and developed is five acres less for Alternative 4 compared to Alternative 3. In addition, the proposed energy generation for both alternatives would be the same at 45 MW. Cultural resources that may exist in the setback area would not be affected because the area would not be disturbed.

4.7.2.5 Alternative 5: Smaller Project

This alternative would reduce the output of the solar power plant from 45 MW to 30 MW and also reduce the size of the developed area from 433 to 238 acres. This alternative would consist of the development of 120 acres west of Santa Fe Fire Road, the realignment of Zircon Road, the development of 108 acres east of Santa Fe Fire Road, but the area south of the relocated Zircon Road would not be developed.

Similar to Alternatives 3 and 4, Alternative 5 would require an amendment to the CDCA Plan to change the ROW designation to suitable for solar energy development.

Effects to cultural resources resulting from this alternative would be similar to those identified under Alternative 3; however, potential to uncover cultural resources during construction would be slightly less than the Proposed Action because there would be less area disturbed.

4.7.3 Cumulative Effects

Impact Methodology

For the cumulative effects analysis, a CESA has been identified to specifically address the cumulative effects for cultural resources. Cumulative effects can result from individually minor but collectively significant actions taken over time. Major past, present, and reasonably anticipated future land uses and disturbances in the area have been identified in Section 3.18 and include energy generation, military uses, commercial and residential developments, and roadway improvements. Dispersed recreation (including special motorized vehicle events), as well as residential and commercial development, also occur in parts of the CESAs.

Geographic Extent

For the purposes of this analysis, a cumulative effect would occur if the incremental effect from the Proposed Action or alternatives would contribute to a significant loss of cultural or historic resources. To ensure adequate coverage of all related resources, the CESA for cultural or historic resources is 10 miles.

Past, Present and Reasonably Foreseeable Projects and Changes

The following projects have been identified as requiring actions that may disturb the sediments within the CESA and therefore may have an effect on cultural and historical resources:

- FPL Energy—CACA 47043;
- UPC Wind Management—CACA 47102;
- West Fry Wind, LLC (FPL Energy)—CACA 48902;
- Solel Inc.—CACA 50150;
- LSR Pisgah LLC—CACA 50706;
- Chevron PV Geotesting Land Use Permit—CACA 05062;
- Caltrans Camprock Rd./SR 247 Bridge and Road Realignment Right-of-Way; and
- PGE Cushenbury Natural Gas Line.

Cumulative Impact Analysis

No resources eligible for inclusion in the National Register of Historic Places have been identified within the project area. Furthermore, given the proposed mitigation measures for the project and likely mitigation measures to be implemented for the projects listed above, effects to unanticipated discoveries would be protected. Therefore, no incremental effects are expected, and thus, no cumulative effects would result from the project.

4.7.4 Residual Effects

Residual effects resulting from erosion due to water drainage could possibly affect unidentified surface or subsurface cultural resources. Presence of the solar field would not require significant modifications of the natural drainage patterns at the site.

The solar panels would be mounted in a manner that follows the existing topography and, as a result, would not substantially change the natural flow of water across the site. Vegetation would be cleared; however, plant root systems would generally be left in place, except where grading and trenching is required for placement of solar module foundations, underground electric lines, inverter and transformer pads, roads and access ways, and other facilities.

Micrograding would be used to cut access paths between the panel rows. Rough site grading, excavation, and backfilling would be performed using heavy duty earthmoving equipment.

Phase II would be constructed in the same manner as Phase I, but Phase II would not require construction of permanent and short-term work areas or another switchyard or operation and maintenance building. Many of the same laydown and construction areas for Phase I would be reused for Phase II.

To minimize or avoid potential effects from erosion, all the Action alternatives would include siltation prevention measures that would be discussed in the Stormwater Pollution Prevention Plan that would be approved by the BLM and the RWQCB. No residual effects on cultural resources would result from the Action alternatives and implementation of MM CULT-1.

4.8 Paleontological Resources

This section discusses effects on paleontological resources that may occur with implementation of the Proposed Action or alternatives. First, the indicators used to identify and analyze effects are presented; second, potential effects are discussed, and an agency recommended mitigation measure are presented; and third, a discussion of residual and cumulative effects is provided.

4.8.1 Indicators

NEPA requires that important natural attributes of our national heritage are considered when assessing the environmental consequences of any project. NEPA does not refer to paleontological resources specifically; however, NEPA Section 101(b)(4) states that it is the responsibility of the federal government to “preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice.” NEPA does not provide impact indicators specifically for paleontological resources.

It is the policy of the BLM, however, that potential effects on scientifically significant paleontological resources be identified and proper mitigation be implemented (BLM 2008). Pursuant to BLM policy, the project would adversely affect paleontological resources if it would damage or destroy fossils or cause the loss of valuable scientific information by disturbing the geology in which fossils are found.

4.8.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. All effects discussed in this section are direct.

4.8.2.1 Alternative 1: No Action/No Plan Amendment

Under NEPA, the BLM must consider an alternative that assesses effects that would occur if the project were not approved and the application were rejected. The No Action Alternative assumes that the ROW application is denied and the CDCA Plan is not amended. Under this alternative, there would be no construction and the project site would not be disturbed, thus there would be no effect on paleontological resources.

4.8.2.2 Alternative 2: Land Use Plan Amendment

Alternative 2 would deny the ROW application, but the CDCA Plan would be amended to classify the site of the project as either suitable or unsuitable for large-scale solar development. Under this alternative, there would be no construction and the project site would not be disturbed, thus there would be no effect on paleontological resources.

4.8.2.3 Alternative 3: Proposed Action

Effects that could result from the implementation of Alternative 3 during construction, operations and maintenance, or decommissioning activities associated with either Phase I or II are analyzed in this section.

Construction (Phases I and II)

Phases I and II of the Proposed Action include preconstruction activities, consisting of staking and flagging and clearing. Preconstruction also includes earthwork on approximately 12.5 acres of grading or developing for 0.003 acre for the switchyard, 0.006 acre for the operation and maintenance building, 7 acres for the access road, 5 acres for the power line, and 0.5 acre for the parking/laydown area. Another 420 acres would be grubbed or scarified for solar panel installation. Disturbance associated with installation of the 33-kV overhead distribution line, T1 data line, and new power poles is included in the power line disturbance noted above.

An adverse effect on a paleontological resource could occur if damage resulted from earth moving or other construction activities.

Effect PALEO-1: Construction activities could destroy or disturb an unknown paleontological resource.

A paleontology literature and records review for the Proposed Action was conducted by the Division of Geological Sciences of the San Bernardino County Museum and included a search of the Regional Paleontologic Locality Inventory (RPLI). The results of the RPLI search indicate that the Proposed Action has a low potential to affect significant nonrenewable fossil resources because the Quaternary alluvium it would be located on has low paleontologic sensitivity. However, Pleistocene older alluvium and other fossil-bearing rock would have high potential to contain significant vertebrate fossils. Such sediments may be encountered during subsurface construction activities, resulting in accidental damages to paleontological resources. With implementation of MM PALEO-1, Alternative 3 of the Proposed Action would not result in an adverse effect to an unknown paleontological resource.

MM PALEO-1: Addressing Unanticipated Discoveries. Prior to any construction activity for Phases I or II, the Applicant would implement actions (herein referred to as “features”) to limit potential adverse effects to paleontological resources in the event of an unanticipated discovery. Specifically, the features would be consistent with the management plans of the BLM Barstow Field Office and all other applicable laws, policies, and regulations governing paleontological resources. The features would include immediately stopping all construction activities when a paleontological resource is discovered and immediately contacting the archaeologist at the BLM Barstow Field Office who would determine the appropriate management actions to be taken. The features would reference BLM Manuals 8270 and 8270-1, *Paleontological Resource Management*, and *General Procedure Guidance for Paleontological Resource Management*, respectively.

Operations and Maintenance (Phases I and II)

No effect on paleontological resources would result during operations and maintenance of the Proposed Action.

Decommissioning

The expected life of the Proposed Action is 30 years. Should the site of the Proposed Action be decommissioned, all equipment, buildings, concrete foundations, and driven piles would be removed. Consistent with BLM requirements, a detailed decommissioning plan would be developed in a manner that both protects public health and safety and is environmentally acceptable. Implementation of MM PALEO-1 would ensure no adverse effects on unanticipated paleontological resources identified during decommissioning activities. In addition to implementation of MM PALEO-1, the Applicant would comply with any new regulations pertaining to paleontological resources that are in effect at the time of decommissioning.

4.8.2.4 Alternative 4: Modified Site Layout

Short-term and long-term effects during Phases I and II under Alternative 4 would be similar to those identified under Alternative 3. Both Alternative 3 and 4 have identical construction durations, and the difference between the total areas graded and developed is five acres less for Alternative 4 compared to Alternative 3. In addition, the proposed energy generation for both alternatives would be the same at 45 MW.

4.8.2.5 Alternative 5: Smaller Project

This alternative would reduce the output of the solar power plant from 45 MW to 30 MW and also reduce the size of the developed area from 433 to 238 acres. This alternative would develop 120 acres west of Santa Fe Fire Road, would realign Zircon Road, would develop 108 acres east of Santa Fe Fire Road, but would not develop the area south of the relocated Zircon Road.

Similar to Alternatives 3 and 4, Alternative 5 would require an amendment to the CDCA Plan to change the ROW designation to suitable for solar energy development.

Effects to paleontological resources resulting from this alternative would be similar to those identified under Alternative 3; however, potential to uncover paleontological resources during construction would be slightly less than the Proposed Action because there would be less area disturbed.

4.8.3 Cumulative Effects

Impact Methodology

For the cumulative effects analysis, a CESA has been identified to specifically address the cumulative effects for paleontological resources. Cumulative effects can result from individually minor but collectively significant actions taken over time. Major past, present, and reasonably anticipated future land uses and disturbances in the area have been identified in Section 3.18 and include energy generation, military uses, commercial and residential developments, and roadway improvements. Dispersed recreation (including special motorized vehicle events), as well as residential and commercial development, also occur in parts of the CESAs.

Geographic Extent

A cumulative effect is a significant loss of fossils or the loss of valuable scientific information by disturbing the geology in which fossils are located. For the purposes of this analysis, the CESA for paleontological resources is 10 miles.

Past, Present, and Reasonably Foreseeable Projects and Changes

The following projects have been identified as actions that may disturb the geology within the CESA and therefore may affect unrecorded paleontological resources:

- FPL Energy—CACA 47043;
- UPC Wind Management—CACA 47102;
- West Fry Wind, LLC (FPL Energy)—CACA 48902;
- Solel Inc.—CACA 50150;
- LSR Pisgah LLC—CACA 50706;
- Caltrans Camprock Rd./SR 247 Bridge and Road Realignment Right-of-Way; and
- PGE Cushenbury Natural Gas Line.

Please refer to Table 3.18-1 for additional details on these projects.

Cumulative Impact Analysis

No fossils have been located within the project area. MM PALEO-1 would ensure that Alternative 3 would avoid any inadvertent impacts on unknown paleontological resources during construction, operation, and decommissioning. Because all impacts on paleontological resources could be avoided or fully mitigated, the project would not contribute to cumulative impacts on paleontological resources.

The cumulative effects on paleontological resources from Alternative 4 and 5 are the same as those under the Proposed Action (Alternative 3) in that there would be no cumulative effects.

Alternatives 1 and 2 would have no cumulative effects on paleontological resources.

4.8.4 Residual Effects

No residual effects on paleontological resources would result from implementation of the action alternatives.

4.9 Land Use and Realty

This section discusses effects on land use and realty that may occur with implementation of the Proposed Action or alternatives. First, the indicators used to identify and analyze effects are presented; second, potential effects are discussed; and third, a discussion of residual and cumulative effects is provided.

4.9.1 Indicators

The project would affect land use and realty if it would:

- Restrict land use authorizations of the BLM; or
- Directly conflict with the goals, policies, or objectives of applicable land use plans.

4.9.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative.

4.9.2.1 Alternative 1: No Action/No Plan Amendment

Under NEPA, the BLM must consider an alternative that assesses effects that would occur if the project were not approved and the application were rejected. The No Action Alternative assumes that the ROW application is denied and the CDCA Plan is not amended. Under this alternative, there would be no construction and the project site would not be disturbed, thus there would be no effect on land use and realty.

4.9.2.2 Alternative 2: No Action with Plan Amendment

Alternative 2 would deny the ROW application, but the CDCA Plan would be amended to classify the site of the project as either suitable or unsuitable for large-scale solar development. Under this alternative, there would be no construction and the project site would not be disturbed, thus there would be no effect on land use and realty.

4.9.2.3 Alternative 3: Proposed Action

Effects that could result from the implementation of Alternative 3 during construction, operations and maintenance, or decommissioning activities associated with either Phase I or II are analyzed in this section.

Alternative 3 includes an amendment to the CDCA Plan to change the ROW designation to suitable for solar energy development. With the amendment, the Proposed Action would comply with the goals, policies, and objectives of the CDCA Plan.

During the scoping process, several comments suggested that the Proposed Action would affect “pristine” land, “undisturbed” land, or land with special management constraints. As described in Section 3.9, the site has previously been disturbed with historic low-level mineral

exploration and contains no special management constraints. The nearest special management area, the Carbonate Endemic Plants ACEC, is located 1.8 miles south of the site.¹

The site is located on land designated MUC M (moderate), which allows energy generating facilities, including solar development; however, the site would extend 1.4 miles into a three-mile-wide CDCA Plan-designated “contingent” utility corridor (Corridor “S”). The Energy Production and Utility Corridor Element of the CDCA Plan currently allows only linear utilities, such as highways, pipelines, transmission lines, communications lines, and natural gas pipelines, to be sited within the corridor. As a result, a plan amendment to allow large-scale solar generation that may block the construction of such projects may appear to conflict with the goals of the CDCA Plan. The Proposed Action, however, has been sited directly west of rugged terrain, which forms a natural barrier to linear utility development. Because the cost of building any infrastructure over this terrain would be significantly more expensive than circumventing it, potential developers would be more likely to site linear infrastructure to the north of the Proposed Action. Therefore, the Applicant’s analysis of the corridor (CES 2009) concluded that sufficient area would remain in the corridor for reasonably foreseeable future utility projects as depicted in Figure 3.9-2. The Proposed Action would, therefore, have no adverse effect on the BLM’s ability to site future utilities within the corridor and would not conflict with either the Energy Production and Utility Corridor Element or the MUC M designation of the CDCA Plan.

Land Use Plan Amendment Analysis

The proposed land use plan amendment to be made by the BLM is a site identification decision only. The proposed solar project and all of its alternatives are located within Multiple Use Class M. 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 M 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 M designations, the authorized officer is directed to use his judgment in allowing for consumptive uses by taking into consideration the desert resources and methods to mitigate damage to those resources which permitted use may cause.

The proposed site location for the project 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 M lands may be allowed on suitable land classified for these purposes. The site is not currently used for agriculture, and none of the project alternatives would involve use of the site for agriculture. Therefore, all five alternatives would be in conformance with this guideline.
2. Air Quality: Class M 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 air emissions that would be associated with the proposed project are discussed in Section 4.1. These values have been compared

¹ Additional details on Special Management Areas and Visual Resources are presented in Sections 3.10 and 3.12 of this EIS.

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 Alternative 5 would be lower than those of Alternatives 3 and 4, and there would be no emissions associated with the No Action Alternative and the Land Use Plan Amendment Alternative. Therefore, all of the alternatives would conform to the Class II objectives referenced in the CDCA Plan guidelines.

3. Water Quality: Class M designations will be managed to provide for the protection and enhancement of surface and groundwater resources, and BMPs will be used to avoid degradation and to comply with Executive Order 12088. Section 4.5 of this EIS evaluated the Alternatives for groundwater use conflicts, the potential to impact groundwater quality, and the potential to impact surface water resources. Development and operation of the project on with active washes crossing the site raised concerns for changing stormwater surface flow across the project. The incorporation of low impact development practices with limited grading to maintain natural sheet flow across the site were developed by the applicant, in coordination with the BLM, to reduce these potential impacts. The Streambed Alteration Agreement between the applicant and California Department of Fish and Game will provide additional requirements related to stormwater surface flow. Alternative 3 provided for the redirection of a small amount of stormwater to a vegetative area near the site boundary. All other action alternatives preserved the natural flow as best practical. Alternatives 1 and 2 did not change the existing situation. 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: Archaeological and paleontological values will be preserved and protected. Procedures described in 36 CFR 800 will be observed where applicable. Sections 4.7 and 4.8 describe the impacts on cultural and paleontological resources associated with the development and operation of the proposed project and other alternatives. All five alternatives would conform to the guidelines. The sites that would be disturbed by the proposed action and all the alternative sites were identified as not eligible for inclusion in the NRHP. All of the 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 on Multiple Use Class M lands with appropriate Native American groups consulted. Repeated efforts and opportunities have been provided to allow tribal entities to raise concerns. Consultation has occurred when requested by the Tribes. Cultural guidelines with respect to requirements for consultation have been met. In addition, the protection of cultural resources, as discussed in Section 4.7 and in Item Number 4 above, ensures that preservation and protection of cultural and religious values is accomplished in accordance with the CDCA Plan MUC guideline.
6. Electrical Generation Facilities: Solar generation may be allowed after NEPA requirements are met. The analysis contained in the EIS, which addresses the proposed action and its alternatives, comprise the NEPA compliance required for this MUC guideline.
7. Transmission Facilities: Class M guidelines allow electric transmission to occur in designated ROW corridors. This project is located in a corridor. Additionally a transmission line is not a part of this project. This project connects to the electrical grid

through a distribution line. All alternatives are in conformance with the CACA Plan requirements for Class M transmission Facilities.

8. Communication Sites: None of the alternatives would not involve the installation of communications sites.
9. Fire Management: Fire suppression measures in Class M 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 California Desert District Fire Management Plan, March 2008. That Plan addresses management and suppression of wildfires, and does not address incidents on specific facilities such as power plants. 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.
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 M areas is only allowed by permit after NEPA requirements are met, and after development of necessary stipulation. Approval of the ROW grant for the any of the action alternatives would constitute the permit for such removal. The mitigation measures in the EIS 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. 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 action 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. This is fully evaluated in Section 4.6.

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. Further information on sensitive plant species may be found in Section 4.6, including mitigation measures to reduce the potential impact of the action alternatives. 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 project.

Vegetation Manipulation – Manipulation of vegetation in Class M areas by mechanical control or aerial broadcasting is permitted after consideration of possible impacts. 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. None of these actions would be conducted as part of the action alternatives. Therefore, each alternative would conform with the guidelines.

11. Land Tenure Adjustment: Land would be acquired, disposed of, or exchanged in accordance with FLPMA. None of the alternatives would involve the change of ownership of land.
12. Livestock Grazing: No alternatives involve the addition of livestock or livestock support facilities.
13. Minerals: No alternatives involve the development of minerals on Class M lands.
14. Motorized Vehicle Access/Transportation: Pursuant to the CDCA LUP guidelines in Class M 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). With the proposed action and its action alternatives, existing one segment of a route is being closed, and a new segment of this route is being created in an OHV-limited area. These changes may be made with site-specific NEPA analysis. This analysis is provided in Section 4.11. The access needs for the proposed solar facility do not substantially differ among the various site location alternatives presented in the FEIS. For any of the site location alternatives, road ROW grants would be approved that allow for the improvements to Santa Fee Fire Road as the main access road to the project. This activity falls within the CDCA LUP guideline noted above.
15. Recreation: The action alternative would not involve the use of the proposed project for recreational uses.
16. Waste Disposal: No alternatives would involve the development of waste disposal 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 4.6, the desert tortoise, which is listed as federally and state threatened, would be affected by the action alternatives. However, none of the alternatives would affect critical habitat. BLM has initiated formal consultation with the U.S. Fish and Wildlife Service in accordance with Section 7 of the Endangered Species Act. Section 4.6 identifies 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 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. No BLM sensitive wildlife species (other

than the desert tortoise, identified and discussed in the previous paragraph) are present on the sites associated with the proposed project and its alternatives.

The action alternatives including the mitigation measures associated with these actions, would involve habitat manipulation to improve habitat (such as tortoise fencing along roads and restoration work). Habitat manipulation is allowed in Class M subject to environmental assessment, which will be completed separately. Therefore, the proposed project and its alternatives would be in conformance with these guidelines.

The action alternatives including the translocation associated with these actions, would not involve the control of depredation wildlife and pests, other than providing financial support for the California Department of Fish and Game's Raven Management Plan. This plan will be evaluated under a separate authority. Therefore, this guideline is not applicable to these actions.

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 these areas.
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. No wild and free-roaming horses are present in the project area.

4.9.2.4 Alternative 4: Modified Site Layout

Short-term and long-term effects during Phases I and II under Alternative 4 would be slightly less than those identified under Alternative 3. Both Alternative 3 and 4 have identical construction durations, and the difference between the total areas graded and developed is five acres less for Alternative 4 compared to Alternative 3. In addition, the proposed energy generation for both alternatives would be the same at 45 MW.

4.9.2.5 Alternative 5: Smaller Project

This alternative would reduce the output of the solar power plant from 45 MW to 30 MW and also reduce the size of the developed area from 433 to 238 acres (Figure 2-5). This alternative would develop 120 acres west of Santa Fe Fire Road, realign Zircon Road, would develop 108 acres east of Santa Fe Fire Road but would not develop the area south of the relocated Zircon Road.

Similar to Alternatives 3 and 4, Alternative 5 would require an amendment to the CDCA Plan to change the ROW designation to suitable for solar energy development.

Effects to land use during Phases I and II of this alternative would be similar to those identified under Alternative 3; however, fewer acres would be developed and would, therefore, be available for other allowable uses. As explained under Alternative 3, it is unlikely that the site of the project would be used for future linear infrastructure development because of rugged terrain to the east of the site. Therefore, the construction, operation, and maintenance of Alternative 5 would not conflict with the goals of the Energy Production and Utility Corridor Element of the CDCA Plan as future linear infrastructure development would be more likely to occur north of the project area (see Figure 3.9-2).

4.9.3 Cumulative Effects

Impact Methodology

For the cumulative effects analysis, a CESA has been identified to address the cumulative effects for land use and realty. Cumulative effects can result from individually minor but collectively significant actions taken over time. Major past, present, and reasonably anticipated future land uses and disturbances in the area have been identified in Section 3.18 and include energy generation, military uses, commercial and residential developments, and roadway improvements. Dispersed recreation (including special motorized vehicle events), as well as residential and commercial development, also occur in parts of the CESAs.

Geographic Extent

For this analysis, the CESA for lands and realty has been determined to be 6 miles. This is the radius away from the project site in which changes in land use could reasonably be expected to affect surrounding land uses and realty actions.

Past, Present, and Reasonably Foreseeable Projects and Changes

Cumulative effects on land use and realty may be caused by the following projects on lands under BLM management:

- LSR Pisgah LLC—CACA 50704;
- Solel Inc.—CACA 50150;
- LSR Pisgah LLC—CACA 50706;
- Chevron PV Geotesting Land Use Permit—CACA 05062;
- JPL Balloon Testing Land Use Permit for Soggy Dry Lake area—CACA-50568; and
- Replacement of two fire-damaged poles.

Cumulative Impact Analysis

As noted above, the project could affect the lands and realty program by restricting BLM land use authorizations or directly conflicting with the goals, policies, or objectives of applicable land use plans. Under current management, BLM issues permits, leases, and grants for lands under its jurisdiction throughout the California Desert District.

The elimination of 516 acres from multiple uses for the project would reduce the amount of land available for other uses for the project's lifespan. Commercial film permits would still be issued, but the background would be a developed solar field rather than a desert environment. Given that several other key areas within the CDCA, including lands within the Twentynine Palms Marine Corps Air Ground Combat Center Land/Airspace Acquisition Study, have been or may be closed to commercial filming and photography, the additional loss of the 516 acres would be a cumulative effect on commercial film permits. Almost all of the projects listed above would

develop undeveloped land that would be unavailable for any other use. This would result in a cumulative loss of available land.

The cumulative impacts of this and the many other reasonably foreseeable power projects in and around Lucerne Valley may require significant transmission upgrades to deliver the power to the SCE service area. This could impact land use if the transmission lines are developed on public land.

No other lands and realty program related issues have been identified.

4.9.4 Residual Effects

No residual effects on land use and realty would result from implementation of the Action alternatives.

4.10 Special Management Areas (Special Designations)

This section discusses the effects on Special Management Areas (SMAs) that may occur with implementation of the Proposed Action or alternatives. First, the indicators used to identify and analyze effects are presented; second, potential effects are discussed; third, residual and cumulative effects are provided.

4.10.1 Indicators

In general, the project would not affect SMAs. The site is not located in an SMA, and there are no SMAs within one mile of the site.

4.10.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. Wilderness characteristics will not be further analyzed by alternatives since wilderness characteristics are not present on the site.

4.10.2.1 Alternative 1: No Action/No Plan Amendment

Under NEPA, the BLM must consider an alternative that assesses effects that would occur if the project were not approved and the application rejected. The No Action Alternative assumes that the ROW application is denied and the CDCA Plan is not amended. Under this alternative, there would be no construction and the project site would not be disturbed, thus there would be no effect on SMAs.

4.10.2.2 Alternative 2: Land Use Plan Amendment

Alternative 2 would deny the ROW application, but the CDCA Plan would be amended to classify the site as either suitable or unsuitable for large-scale solar development. Under this alternative, there would be no construction and the project site would not be disturbed, thus there would be no effect on SMAs.

4.10.2.3 Alternative 3: Proposed Action

The Proposed Action would be located approximately eight miles east of the junction of Barstow Road and Old Woman Springs Road on partially disturbed mining land. The nearest SMA to the site is the Carbonate Endemic Plants ACEC 1.8 miles south. At this distance, the SMA is far enough from the site that there would be no effect on it as a result of construction, operation and maintenance, or decommissioning.

State Route 247 is a County-designated Scenic Route. Drivers along State Route 247 would have short-term views of the Proposed Action site during construction, operations and maintenance, and reclamation. Impacts to sensitive viewers is evaluated in more detail in Section 4.12.

4.10.2.4 Alternative 4: Modified Site Layout

Effects under this alternative would be the same as those associated with the Proposed Action (Alternative 3), except for three modifications to reduce environmental effects. First, to reduce effects on visual resources, the setback between the solar arrays and Santa Fe Fire Road would be increased to 50 feet. Second, the increased setback would be planted with native vegetation to provide a vegetative screen between Santa Fe Fire Road and the solar arrays. Third, the drainage plan for the site would be revised to redirect sheet flow from the site into the setback. Since this alternative would remain within the property line of the site, construction, operation and maintenance, and decommissioning of this alternative would have no effect on SMAs.

4.10.2.5 Alternative 5: Smaller Project

This alternative would reduce the output of the solar power plant from 45 MW to 30 MW and also reduce the size of the developed area to 238 acres. This alternative would include the development of the area east of Santa Fe Fire Road and the relocation of Zircon Road. The area south of the relocated Zircon Road would not be developed reducing the east side foot print from 180 to 108 acres. This alternative would include the development of 120 acres west of Santa Fe Fire Road, as opposed to 240 acres under Alternative 3.

Similar to Alternatives 3 and 4, Alternative 5 would require an amendment to the CDCA Plan to change the ROW designation to suitable for solar energy development.

Effects under this alternative would be the same as those associated with the Proposed Action (Alternative 3). Because this alternative would remain within the property line of the site of the project, construction, operation and maintenance, and decommissioning of this alternative would have no effect on SMAs.

4.10.3 Cumulative Effects

Impact Methodology

For the cumulative effects analysis, a CESA has been identified to specifically address the cumulative effects for special management areas. Cumulative effects can result from individually minor but collectively significant actions taken over time. Major past, present, and reasonably anticipated future land uses and disturbances in the area have been identified in Section 3.18 and include energy generation, military uses, commercial and residential developments, and roadway improvements. Dispersed recreation (including special motorized vehicle events), as well as residential and commercial development, also occur in parts of the CESAs.

Geographic Extent

The CESA for special management areas is designated as a five-mile radius around the project site. The primary area of concern with regard to cumulative impacts for the project is that portion of SR 247 from Yucca Valley to Barstow that is designated by San Bernardino County as a scenic route. Drivers' views along this scenic route could be affected by cumulative developments within the CESA. Cumulative projects at distances greater than five miles from the project site fall into the "seldom seen distance zone."

Past, Present, and Reasonably Foreseeable Projects and Changes

The following projects are within the CESA for SMAs and are also within five miles of SR 247. They would likely have some type of visual impact on this County Designated Scenic Highway:

- LSR Pisgah LLC—CACA 50704;
- Solel Inc.—CACA 50150;
- LSR Pisgah LLC—CACA 50706;
- JPL Balloon Testing Land Use Permit for Soggy Dry Lake area—CACA-50568;
- Caltrans Camprock Rd./SR 247 Bridge & Road Realignment Right-of-Way;
- Cove Road Right-of Way; Pave and Widen Access to Private Land;
- PGE Cushenbury Natural Gas Line; and
- SB-3 Rabbit Springs Solar, LLC P200900655.

Cumulative Impact Analysis

A cumulative effect on SMAs would include conflicts from the project when combined with other activities' effects in the CESA for SMAs. State Route 247 is a county-designated scenic route, and Caltrans has determined that the entire length of SR 247 is eligible for designation as a State scenic highway. No other SMAs are located within a mile of the project. The past, present, and reasonably foreseeable future activities listed above that are along the route could combine with those of the project to cause a cumulative effect. If the intensity of this development should exceed guidelines for scenic highway designation, it is possible that the project could cause a cumulative effect and jeopardize the designation status.

4.10.4 Residual Effects

No residual effects on SMAs would result from implementation of the action alternatives.

4.11 Recreation

This section discusses effects on recreational resources that may occur with implementation of the Proposed Action or alternatives. First, the indicators used to identify and analyze effects are presented; second, potential effects are discussed, and agency recommended mitigation measures are presented; third, a discussion of cumulative and residual effects is provided.

4.11.1 Indicators

The project would affect recreational resources if it would:

- Violate a legal standard for protection of recreation areas;
- Increase recreational user conflicts;
- Reduce the use or exceed the capacity of an existing recreation area; or
- Disrupt or disturb access to a recreation area.

4.11.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative.

4.11.2.1 Alternative 1: No Action/No Plan Amendment

Under NEPA, the BLM must consider an alternative that assesses effects that would occur if the project were not approved and the application rejected. The No Action Alternative assumes that the ROW application is denied and the CDCA Plan is not amended. Under this alternative, there would be no construction and the project site would not be disturbed, thus there would be no effect on recreation.

4.11.2.2 Alternative 2: Land Use Plan Amendment

Alternative 2 would deny the ROW application, but the CDCA Plan would be amended to classify the site of the project as either suitable or unsuitable for large-scale solar development. Under this alternative, there would be no construction and the project site would not be disturbed, thus there would be no effect on recreation.

4.11.2.3 Alternative 3: Proposed Action

This alternative would result in the approval of the ROW application and CDCA Plan amendment and realignment of Zircon Road. The realignment would be through the Proposed Action site to allow its continued public use; however, it would not be in designated wilderness areas or primitive areas.

Construction (Phases I and II)

During construction, portions of Santa Fe Fire Road may be temporarily inaccessible; however, the road would not be completely closed to vehicle traffic during construction of the Proposed

Action. During this time, recreational users attempting to access the San Bernardino National Forest would be able to use Santa Fe Fire Road. The temporary closure of portions of Santa Fe Fire Road during grading and hardening would result in short-term effects on access but long-term beneficial effects on the quality of the road. Closure of Santa Fe Fire Road would not affect any other designated recreational area.

The proposed realignment of Zircon Road would not be located in a wilderness or recreation area and would not result in damage to soil, watershed(s), vegetation, air, or other resources within the project site. Furthermore, the road realignment would not adversely affect natural aesthetic scenic values and would be compatible with surrounding uses. Implementation of the mitigation measures described in this and other EIS sections would reduce effects on recreational resources.

Zircon Road in its present form would remain open until the realignment is completed. This would allow recreational access, and would not cause an increase in conflict for recreational user. The site would be cleared of desert tortoises, and fencing for desert tortoise (MM BIO-10) would be installed around all construction areas prior to the initiation of earth disturbing activities, including the areas along the northern and southern edges of the realigned roadway. Prior to construction, any cacti/yucca within the project boundary, including the realigned portion of Zircon Road, would be flagged for salvage and removed, as feasible. Dust control measures and erosion control measures identified in the Applicant's Draft Dust Control Plan (Appendix G) and Draft Stormwater Pollution Prevention Plan (Appendix I) would also be implemented throughout the entire site.

Therefore, the realignment of Zircon Road would not cause a loss of access through the project area and would not conflict with OHV use and other existing or proposed recreational uses of neighboring public lands. Through implementation of the desert tortoise fencing, vegetation salvage, dust and erosion control measures, potential impacts to soil, watershed, vegetation, air quality, and disruption of wildlife or wildlife habitats would be minimized.

Construction of the Proposed Action would affect off-site recreational uses through short-term disruption of access from fugitive dust from clearing and grading and long-term alteration of the views as seen from recreation areas; however, visual effects are discussed in greater detail in Section 4.12.

Effect REC-1: Construction activities would temporarily disrupt recreational access to the San Bernardino National Forest.

To minimize effects on recreational users, the following mitigation measure would be implemented:

MM TRAN-1: Implement Traffic BMPs During Construction of Phase I and II. Refer to Section 4.13, "Transportation/Motorized Vehicle Access."

Effects on recreational users would be further reduced during construction activities through implementation of the mitigation measure below:

MM REC-1: Signage. During construction of Phase I and II, the Applicant would post signs at the junction of Old Woman Springs Road and Santa Fe Fire Road one month prior to the closure of Santa Fe Fire Road. These signs would notify the public of the duration of construction and applicable traffic control measures. The Applicant would be responsible for maintaining the signs until Santa Fe Fire Road is reopened for public use.

Effect REC-2: Construction of the Proposed Action would introduce additional visual contrast into the viewshed of the Lucerne Valley as seen from State Route 247 and the San Bernardino National Forest.

Effects of the alteration of these viewsheds and corresponding mitigation can be found in Section 4.12, "Visual Resources."

Operation and Maintenance (Phases I and II)

Operation and maintenance of the Proposed Action would not result in effects on recreational users. While maintenance personnel would likely use Santa Fe Fire Road and Zircon Road (BLM "open" routes), their presence would not prohibit the use of these roads by recreational users. Both roads would remain open.

Decommissioning

Decommissioning of the Proposed Action would result in a short-term increase in vehicle traffic on Santa Fe Fire Road, which is also used for OHV recreation. The disturbance would result in a short-term effect on recreational users of Santa Fe Fire Road.

Reroute of Zircon Road

The three action alternatives propose a reroute of a portion of Zircon Road, a currently "open" designated route of travel. A meandering section of Zircon road that passes through the project site would be designated as 'closed'. It would be closed to public use. A new section of road would be constructed so that it passes through the site in a straight east/west direction. This new section would be designated as 'open'. It would be available for public use. The newly constructed road would connect to the existing Zircon Road at each end and would provide continuity of travel to recreational users and local residents.

43 Code of Federal Regulations (CFR) Part 8342.1 establishes criteria to consider when making route designations. The designations should be based on protecting the resources of the public lands, promoting the safety of the public land users, and minimizing the conflicts among the various public land users. The following will provide an analysis for the relocation of Zircon Road using the required criteria:

- Off-highway vehicle (OHV) areas and trails must be located to minimize the damage to soil, watershed, vegetation, air, or other resources of the public lands and to prevent impairment of wilderness suitability. The relocated road would be engineered, designed to prevent erosion, and shorter in length since it would be straight rather than the existing meandering road. This would reduce erosion, damage to soil, rainwater run off and impacts to the watershed, and air impacts due to dust. The area is not suitable as wilderness.
- OHV areas and trails must be located to minimize harassment of wildlife or significant disruption of wildlife or wildlife habitats. Special attention must be given to protect endangered or threatened species and their habitats. The relocated road will be surrounded by a development project. The area around the road would not be used by wildlife whether the road is relocated or not.
- OHV areas and trails must be located to minimize conflict between OHV use and other existing or proposed recreational uses of the same or neighboring public lands and to ensure the compatibility of such uses with existing conditions in populated areas, taking

into account noise and other factors. The relocated route will be surrounded by a development project. The developer would be required to provide unrestricted access to the route whether it is relocated or not. Conflicts would not change with the relocated road.

- OHV areas and trails must not be located in officially designated wilderness areas or primitive areas. OHV areas and trails may be located in natural areas only if the authorized officer determines that vehicle use in such locations would not adversely affect the natural, aesthetic, scenic, or other values for which such areas are established. This project is not in a wilderness, primitive or natural area.

4.11.2.4 Alternative 4: Modified Site Layout (Phases I and II)

Both Alternative 3 and 4 have identical construction durations, and the difference between the total areas graded and developed is five acres less for Alternative 4 compared to Alternative 3. Therefore, Short-term and long-term effects during Phases I and II under Alternative 4 would be slightly less than those identified under Alternative 3.

4.11.2.5 Alternative 5: Smaller Project

This alternative would reduce the output of the solar plant from 45 megawatts to 30 megawatts. It would also reduce the size of the developed area from 433 acres to 238 acres (Figure 2-5). This alternative would develop 120 acres west of Santa Fe Fire Road, and would realign Zircon Road, would develop 108 acres east of Santa Fe Fire Road, but the area south of the relocated Zircon Road would not be developed.

Reroute of Zircon Road would be the same, except that the relocated route would be surrounded by a development project on one side and available as habitat on the other side. The developer would be required to provide unrestricted access to the route whether it is relocated or not. Conflicts would not change with the relocated road.

Similar to Alternatives 3 and 4, Alternative 5 would require an amendment to the CDCA Plan to change the ROW designation to suitable for solar energy development. Impacts associated with the relocation of Zircon Road under Alternative 5 from construction, operations and maintenance, and decommissioning would be the same as those identified for Alternative 3.

4.11.3 Cumulative Effects

The CESA includes local and regional scales (refer to Table 3.18-1). Locally, under the project the rerouting of Zircon Road would change the existing route to avoid the solar plant. The route change would not affect long-term recreational activities, such as OHV use. Also, the project would contribute to adverse cumulative effects by altering the visual quality of the landscape, although these effects would be within the standards set by the BLM visual resource management system.

On a regional scale, the project, together with other BLM and non-BLM activities in the CDCA, would contribute to a change in the overall landscape that may adversely effect recreational uses. The project would alter the landscape on 516 acres with the solar infrastructure and the interconnection line. Complete build out would likely require upgrades to the existing local transmission system to off-take the power. These actions would cause a cumulative effect, but it

is unlikely that the project would add sufficient power to the electric transmission system to require additional high voltage transmission lines or new substations.

Long-term effects on recreational users would result from the alteration of the viewshed of Lucerne Valley as seen from San Bernardino National Forest. Cumulative impacts on visual resources are discussed in Section 4.12.3, "Visual Resources." With implementation of the mitigation measures described in this and other EIS sections, impacts on recreational resources would be reduced.

4.11.4 Residual Effects

No residual effects on recreational resources would result after implementation of mitigation measures for any of the Action alternatives.

4.12 Visual Resources

This section discusses effects on visual resources that would occur with implementation of the Proposed Action or alternatives, cumulative effects, and mitigation measures to reduce visual effects.

4.12.1 Indicators

There are two levels of analysis associated with the project. 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 project. 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 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.

A full description of the Proposed Action (Alternative 3) and the Modified Site Layout (Alternative 4) accompanied by a discussion from key observation points (KOPs) are used to analyze effects. The effects are evaluated for conformance with VRM objectives and design mitigation measures determined to minimize visual effects. If the original Contrast Rating reveals non-conformance of the project, then the design needs to be modified to meet the VRM Class objectives and supported by updated simulations and contrast evaluations.

Contrast ratings were not prepared for Alternatives 1 and 2 since these alternatives do not result in any landscape alterations.

4.12.2 Key Observation Points

Photographs taken from KOPs were taken with a 35 mm camera and fixed 50 mm lens, with a resulting horizontal field of view of approximately 40 degrees. This field of view approximates the actual field of view experienced if viewed as a 10-inch-wide image at a distance of about one foot.

Each alternative and phases of development (construction, operation, and decommissioning) were evaluated for effects and conformance to the Interim VRM Class objective.

KOPs are selected from careful evaluation of the most critical viewpoints which may include travel routes, scenic overlooks, communities or outlying residential neighborhoods, National Parks, National Wildlife Refuges, campgrounds, etc. Other factors considered include angle of view, viewing distance, number of viewers, length of time in view, project scale relative to the landscape setting, season of use, and light conditions.

The project area is situated within the foreground of Old Woman Springs Road (KOPs 2 and 3), one residence, and the Santa Fe Fire Road OHV route). These viewpoints with foreground views have moderate visual sensitivity. KOP locations are determined based on user sensitivity and/or use volume (Figure 3.12-5). Several residences near Cougar Buttes (KOP 1) are located in the foreground distance zone of the project, and the town of Lucerne Valley is located in the foreground-middleground distance zone. KOP 4 from within the San Bernardino National Forest

along SR 18 has views of the project area in the background distance zone. Blackhawk Mountain blocks direct views of the project area from SR 18. The KOPs are listed in Table 4.12-1 and are mapped in Figure 3.12-5. Character Photo A is shown in Figure 4.12-1, and views from KOPs 1 through 4 are depicted in Figures 4.12-2, 4.12-3, 4.12-4, and 4.12-5.

Table 4.12-1 Character Photographs and Key Observation Points

Key Observation Points	Aspect
Character photographs	Taken from nearby rolling hill landscape
Key Observation Point KOP 1	Taken from dispersed residences near Cougar Buttes
Key Observation Point KOP 2	Taken from SR 247 eastbound
Key Observation Point KOP 3	Taken from SR 247 westbound
Key Observation Point KOP 4	Taken from SR 18 southbound

The site is presently undeveloped, with the exception of dirt roads. Based on the BLM's scenic quality rating system, a scenic quality class of C (Low) is assigned to the rating unit. The Viewer Sensitivity Level is moderate. The natural features of the site form a loosely intact visual pattern, and the visual integrity in the natural landscape is low. The site is situated at an elevation of approximately 3,200 feet. The site is composed mainly of creosote bush scrub.

The site has views to and from the Blackhawk Mountains and the Cougar Buttes (approximately five miles to the south and three miles to the north, respectively). Overall visibility of the site and its surrounding area are shown in Figure 3.12-3. The greatest potential for public views of the site is from the Old Woman Springs Road (SR 247), as seen from KOPs 2 and 3 (Figures 4.12-3 and Figure 4.12-4), and Santa Fe Fire Road. The area immediately surrounding the site is lightly populated with dispersed rural residential viewpoints, as seen in KOP 1 (Figure 4.12-2).

4.12.3 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative.

4.12.3.1 Alternative 1: No Action/No Plan Amendment

Under NEPA, BLM must consider an alternative that assesses effects that would occur if the project were not approved and the application rejected. The No Action Alternative assumes that the ROW application is denied, and the CDCA Plan is not amended. Under this alternative, there would be no construction and the site would not be disturbed; thus, there would be no effect on visual resources.

4.12.3.2 Alternative 2: Land Use Plan Amendment

Alternative 2 would deny the ROW application, but the CDCA Plan would be amended to classify the site of the project as either suitable or unsuitable for large-scale solar development. Under this alternative, there would be no construction and the site would not be disturbed; thus, there would be no effect on visual resources.



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Figure 4.12-1 **Character Photo A** – View from a slight elevation south of the project site



Figure 4.12-2 **Key Observation Point 1** – View from a cluster of rural residences north of the project site



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Figure 4.12-3 **Key Observation Point 2** – Eastward view of the project site from Old Woman Springs Road



Figure 4.12-4 **Key Observation Point 3** – Westward view of the project site from Old Woman Springs Road



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Figure 4.12-5 **Key Observation Point 4** – View from San Bernardino National Forest, south of the project site

4.12.3.3 Alternative 3: Proposed Action

Effects that could result from the implementation of Alternative 3 during construction; operations and maintenance; or decommissioning activities associated with either Phase I or II are analyzed in this section.

Project Appearance

The proposed facilities are described in detail in Chapter 2. Chain-link fencing and desert tortoise fencing would be installed around the site perimeter for security and protection of sensitive biological resources. A new 33-kV overhead distribution line, T1 data line, and new power poles would be installed within the project ROW during Phase I. Project equipment other than the solar collectors would have non-reflective surfaces and neutral colors to minimize their visual effects. Project construction activities typically would occur during normal Monday through Friday working hours.

Project operation would require on-site nighttime lighting for safety and security. To reduce off-site lighting effects, 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 was not required for normal operation, safety, or security; this would allow these areas to remain un-illuminated (dark) most of the time, thereby minimizing the amount of lighting potentially visible off-site.

The Proposed Action's effects on visual conditions during hours of darkness would be moderate to high. Some nighttime lighting would be required for operational safety and security. There would be a small amount of additional visible lighting associated with the project structures and open site areas. When lights were on, they would not be highly visible off-site and would not produce off-site glare effects. The off-site visibility and potential glare of the lighting would be minimized by specification of non-glare fixtures and placement of lights to direct illumination into only those areas where it would be needed.

To the extent feasible and consistent with worker safety codes, lighting required for nighttime construction activities would be directed toward the center of the construction site and shielded to prevent it from straying off-site. Task-specific construction lighting would be used to the extent practical while complying with worker safety regulations. In spite of these measures, there could be times, when and if there were to be nighttime construction, when the site could temporarily appear as a brightly lit area as viewed from nearby locations.

Construction (Phases I and II)

Effect VIS-1: Short-term change to the visual character of the environment.

During the construction period, construction activities and materials, equipment, trucks, and parked vehicles all could be visible on the site and thus temporarily change the existing visual environment. Construction activities would be conducted in a manner that would minimize (visible) dust emissions. Therefore, visual changes associated with construction period activities at the site would be short-term.

Operation and Maintenance (Phases I and II)

Effect VIS-2: Long-term change to the visual character of the environment.

During operation, when viewed from eye level, during most hours of the day, the solar field would be relatively unobtrusive. From elevated locations, the solar facility would have a greater visual effect because a greater portion would be visible. On sunny days, the solar collectors would create a visual impression that more closely would resemble a body of water than a power plant or other industrial facility because the solar collectors would be reflecting the blue sky. On a cloudier day, the visual impression would appear grayer. Viewed from vantages where the backs of the solar panels were visible, the visual effect would be greater as the nonreflective backs of the mirrors would contrast with the surrounding environment.

The solar facility likely would create a fairly substantial visual contrast, particularly for viewsheds directed toward the backs of the solar panels. The interim VRM Class IV objective is to “provide for management activities that allow major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high” (BLM 1986).

As discussed below, overall effects are minor based on KOP-specific considerations. According to the BLM interim VRM Class IV management objectives, the Proposed Action’s contribution to visual resources will not be considered significant. The project would be an industrial facility in a lightly populated area, and there would be a noticeable change to the view for residents and visitors. All potentially considered scenic vistas that would have full visibility of the site occur from elevated positions located more than two miles away from where the project contrast would be seen in the foreground-middle ground distance zone, resulting in moderate rather than strong visual contrasts (Figure 3.12-5).

The site is not in a designated area of natural beauty or scenic recreational area. However, the County of San Bernardino has designated SR 247 as a scenic route. As mentioned earlier, the State only extends scenic highway eligibility to this roadway. The character photo (Figure 4.12-1) shows existing, representative views of the site. As described in Section 3.12, the site is generally unremarkable, with no distinguishing geological features or distinctive vegetation. However, visual resources of the surrounding valley and mountain environment are noticeable with overall views that would be degraded to a degree. The presence of the proposed facilities would create a moderate contrasting change in the visual quality of the overall landscape.

The Proposed Action would be visible from an eligible state scenic highway (SR 247) at less than a quarter mile away. KOPs 2 and 3 show views of the site from SR 247 (Old Woman Springs Road). Duration of view is short, and the highway is not officially designated by Caltrans but does carry the San Bernardino scenic route status; therefore, the Proposed Action would not result in an adverse effect from these views.

The Proposed Action would not result in a major adverse effect upon nighttime views in the area from introducing a new source of light or glare. As discussed earlier, project light fixtures would be restricted to areas required for safety, security, and operations. Lighting would be directed on-site; it would be shielded from public view, and non-glare fixtures would be specified. Switches, sensors, and timers would be used to minimize the time that lights that are not needed for safety and security are illuminated. These measures would be expected to substantially reduce the off-site visibility of project lighting. Lighting that might be installed to facilitate possible nighttime construction activities (if needed) would be directed toward the center of the construction site and shielded to prevent light from straying off-site, as consistent with worker safety codes. Task-specific construction lighting would be used to the extent

practical while complying with worker safety regulations. With these measures, lighting associated with construction and operations would not pose a hazard or substantially affect day or nighttime views of the site.

In sunlight, for viewers looking directly at the solar panels, at a distance or an elevated position, the solar field at its most reflective state would mirror the sky and could appear like a lake at hours of the day when the mirrors were oriented toward the viewer (e.g., looking from the south with the sun behind the viewer on a sunny afternoon). It would not produce significant glare. At night, the solar collectors would not be visible from the viewpoints identified.

The Proposed Action would result in increased levels of visual contrast by introducing new permanent above-ground structures into the landscape. However, these changes would not directly conflict with the management objectives associated with the interim VRM Class established for the site. In summary, visual changes associated with operations and maintenance would be long-term.

Decommissioning

During decommissioning, effects would be similar to those for construction with equipment, trucks, and parked vehicles visible on the site and thus temporarily changing the visual environment. However, decommissioning activities would be conducted in a manner that would minimize (visible) dust emissions. Therefore, visual changes associated with decommissioning would be short-term.

4.12.3.4 Alternative 4: Modified Site Layout

Under Alternative 4, the project would be set back 50 feet and a vegetative screen would be installed. As a result of this, recreationists traveling the Santa Fe Fire Road en route to Blackhawk Canyon would see shielded views of the Proposed Action site which would reduce the visual effect of the experienced under Alternative 3. Motorists travelling Old Woman Springs Road (SR 247) westbound (KOP 3) would also see shielded views of the project site which would reduce the visual effect experienced under Alternative 3. All other viewpoints would have the same views as Alternative 3 and the effects on visual resources would be the same during Phases I and II.

4.12.3.5 Alternative 5: Smaller Project

This alternative would reduce the output of the solar plant from 45 megawatts to 30 megawatts. It would also reduce the size of the developed area from 433 acres to 238 acres (Figure 2-5). This alternative would develop 120 acres west of Santa Fe Fire Road, and would realign Zircon Road, would develop 108 acres east of Santa Fe Fire Road, but would not develop the area south of the relocated Zircon Road.

Similar to Alternatives 3 and 4, Alternative 5 would amend the CDCA Plan to change the ROW designation to suitable for solar energy development.

Visual effects during construction of Phase I and II would be similar to effects under Alternative 3. However, since the construction periods for these phases are shorter under this alternative, effects would be for a shorter time period. Since a smaller amount of area is being developed and the amount of energy being produced is less, the facility itself would be smaller and be less of a contrast to the surrounding area. Visual changes associated with operations and

maintenance would be long-term; however, they would be less than that experienced under Alternative 3.

4.12.4 Cumulative Effects

Impact Methodology

For the cumulative effects analysis, a CESA has been identified to specifically address the cumulative effects for visual resources. Cumulative effects can result from individually minor but collectively significant actions taken over time. Major past, present, and reasonably anticipated future land uses and disturbances in the area have been identified in Section 3.18 and include energy generation, military uses, commercial and residential developments, and roadway improvements. Dispersed recreation (including special motorized vehicle events), as well as residential and commercial development, also occur in parts of the CESAs.

Geographic Extent

The CESA for visual effects includes all projects that would be located within 5 miles of the project. BLM distance zones are foreground (0 to 1 mile), middleground (1 to 3 miles), background (3 to 5 miles), and seldom-seen views (greater than 5 miles) (BLM Manual H-8410-1). The visibility of each project component is constrained to within 5 miles of the project because any greater distance is considered to fall within the seldom-seen distance zone.

Past, Present, and Reasonably Foreseeable Projects and Changes

Cumulative effects on visual resources may be caused by the following projects identified in 3.18-1:

- Solel Inc.—CACA 50150;
- LSR Pisgah LLC—CACA 50706;
- PGE Cushenbury Natural Gas Line;
- SB-26 SPP to add a wood grinding storage and distribution;
- SB-28 CUP to establish a 90-foot monopalm tower; and
- SB-29 CUP to establish an asphalt plant.

Cumulative Impact Analysis

Construction of the project would result in both short- and long-term effects on visual resources. Short-term effects on visual resources would be confined to Santa Fe Fire Road and, therefore, would not contribute cumulatively to the effects of other projects in the area.

Long-term effects on visual resources would be additive to the three other solar projects proposed for the region (Figure 3.18-1). While the project is much smaller in comparison to the other projects, it could remotely resemble a saturation point to public land users in the region. However, the project is located at minimum 4.75 miles and in most cases over six miles from the other larger scale solar projects. Furthermore, the project's footprint of 516 acres is much smaller compared to the 31,236 acres of solar projects shown on Figure 3.18-1. It is highly

unlikely to be able to see all four solar projects at once due to topographic obstructions and the geographic separation.

Each of the other activities shown on Table 3.18-1 are of such scale and type such that they cannot be directly compared to the effect of large-scale solar energy development on public lands in the region.

Long-term effects on visual resources would result from the alteration of the viewshed of Lucerne Valley as seen from elevated viewpoints. While these long-term effects would be consistent with the interim VRM Classes established for the site, and while they would only affect distant views, they would cumulatively contribute to the degradation of visual resources. Therefore, the project would cumulatively contribute long-term unavoidable effects on visual resources.

4.12.5 Residual Effects

Adverse residual effects on visual resources associated with construction and decommissioning of the alternatives would be short-term. Adverse residual effects on visual resources associated with operations and maintenance would be long-term.

4.13 Transportation/Motorized Vehicle Access

This section discusses the effects on transportation and motorized vehicle access that may occur with implementation of the Proposed Action or alternatives. First, the criteria used to identify and analyze effects are presented; second, potential effects are discussed, and agency recommended mitigation measures are presented; third, a discussion of residual and cumulative effects is provided.

4.13.1 Indicators

The project would affect transportation and motorized vehicle access if it would:

- Decrease or disrupt existing primary access on public roads through the area;
- Degrade existing road conditions as a result of construction;
- Impair U.S. Forest Service access to Santa Fe Fire Road; or
- Cause loss of authorized access to private parcels or mining claims.

4.13.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under the NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. All effects discussed in this section are direct. No indirect effects were identified for this resource area.

Effects may arise from physical changes to roads, such as closures and reroutes, construction activity, introduction of construction, or operations/maintenance-related traffic on local roads or changes in daily or peak-hour traffic volumes created by either direct or indirect workforce changes in the area.

4.13.2.1 Alternative 1: No Action/No Plan Amendment

Under NEPA, the BLM must consider an alternative that assesses effects that would occur if the project were not approved and the application were rejected. The No Action Alternative assumes that the ROW application is denied and the CDCA Plan is not amended. Under this alternative, the project would not be constructed, and there would be no project-related effect on transportation or motorized vehicle access.

4.13.2.2 Alternative 2: Land Use Plan Amendment

Alternative 2 would deny the ROW application, but the CDCA Plan would be amended to classify the site of the project as either suitable or unsuitable for large-scale solar development. Under this alternative, the project would not be constructed, and there would be no project-related effect on transportation or motorized vehicle access.

4.13.2.3 Alternative 3: Proposed Action

This alternative would result in the approval of the ROW application and CDCA Plan amendment. With implementation of the mitigation measures described below, the Proposed

Action would result in short- and long-term effects to traffic volumes, no effect to the level of service (LOS), short-term effects to access, and long-term beneficial effects to road conditions.

Effect TRAN-1: Short-term effects on traffic volume as a result of construction

Construction of both phases of the Proposed Action would require activities and equipment movement near and within public roadway ROWs, resulting in short-term increases in the use of local roadways. Heavy equipment would be transported to the site and would likely remain for the duration of construction.

Construction of both phases of the project would result in short-term increases in traffic volume of a maximum of 90 trips per day (45 morning and 45 evening trips) due to the construction labor force (assuming they all drive separately) and approximately 20 trips (10 inbound, 10 outbound) due to delivery of construction equipment and supplies to the site.

This increase in traffic volume would occur primarily on State Route (SR) 247, Foothill Road, and Santa Fe Fire Road as these are the predominant roads that would be used to access the site. A lesser increase in traffic volume may occur on Interstate 15 (I-15), SR 18, and Bear Valley Road. Zircon Road and Santa Fe Fire Road may experience short-term effects as these roads are improved. Up to a maximum of 110 additional trips per day would not change the LOS of SR 247, nor would it affect the LOS of I 15, SR 18, or Bear Valley Road. During Phase II the labor force would mirror the labor force discussed for Phase I. This may result in short-term effects on traffic volume as a result of construction. but not an effect to the LOS with the implementation of MM TRAN-1.

Effect TRAN-2: Short-term effects on access and road conditions as a result of construction

During Phase I, a 33-kilovolt distribution line segment would be constructed across Foothill Road, resulting in short-term effects on Foothill Road as traffic may be stopped periodically while the line is constructed. Disruptions, however, would be temporary and only occur during construction.

During Phase I, Zircon Road would be rerouted within the Proposed Action area to maximize the efficiency of the arrays. Zircon Road would remain a BLM-designated open route, which would be improved by grading, adding an additional four to six inches of gravel, and compaction, where it crosses the Proposed Action area. The reroute of Zircon Road would not cause loss of authorized access to private parcels or mining claims. The original Zircon Road would not be closed until the realignment as been completed. The realignment of Zircon Road would result in long-term, beneficial effects to the quality of the road.

During Phase I, the Applicant would improve Santa Fe Fire Road by grading, adding an additional four to six inches of gravel, and compacting the road for the length of the Proposed Action area. During grading and hardening, portions of Santa Fe Fire Road may be temporarily inaccessible; however, the road would not be completely closed and, therefore, would not cause loss of authorized access to private parcels or mining claims because detour routes would be made available. The residence located adjacent to the site at the intersection of Foothill Road and South Santa Fe Road would have full access to their home during construction. The temporary closure of portions of Santa Fe Fire Road during grading and hardening would result in short-term effects to access but long-term beneficial effects to the quality of the road.

During both phases, oversized loads could cause short-term transportation disruptions and may require wider turning clearance requirements. In the unlikely event that construction activities would require roadway lane closure, it is expected that short detour routes would be made available to avoid creating substantial delays for motorists or emergency vehicles. State and local laws and regulations would be followed for oversized loads. Santa Fe Fire Road would remain open throughout Phase II; therefore, the Proposed Action would not impair U.S. Forest Service access to this road nor would it prevent access to the nearby resident.

Effects on access and road conditions would be reduced by implementing mitigation measures TRAN-1 and TRAN-2.

MM TRAN-1: Implement Traffic BMPs During Construction. The Applicant would implement traffic BMPs to minimize construction-related traffic impacts to access. Specifically, the BMPs would ensure an adequate flow of traffic in both directions by providing sufficient signage to alert drivers of construction zones, notifying emergency responders prior to construction, conducting community outreach, and controlling traffic around schools. The measures would include the following:

- To the extent feasible, truck traffic would be scheduled for off-peak hours to reduce effects during periods of peak traffic;
- Truck traffic would be phased throughout construction;
- Truck traffic would use designated truck routes when arriving to and departing from the proposed work sites;
- If lane closures are required, the Applicant would comply with BMPs established by the Work Area Protection and Traffic Control Manual (California Joint Utility Traffic Control Committee 1996);
- During the rerouting of Zircon Road, the current route would remain open until the new segment is complete;
- During the improvement of South Santa Fe Fire Road, only one side of the road would be closed at a time. The resident directly adjacent the site would not be hindered from accessing their home;
- Traffic control measures, such as flag men, that would be implemented to ensure the safe operation of construction equipment accessing the site and recreational users on Zircon and Santa Fe Fire Road;
- The Applicant would encourage employees to carpool to reduce the number of trips to and from the work site; and
- Signs and public notices about work would be distributed before disruptions occur, identifying detours to maintain access, the use of flagmen or escort vehicles to control and direct traffic flow, and scheduling roadway work during periods of minimum traffic flow.

MM TRAN-2: Repair Damaged Streets. Unanticipated damage to local streets would be repaired. Streets would be restored to their pre-project condition.

Operation and Maintenance (Phases I and II)

Operation and maintenance of both phases of the Proposed Action may result in a long-term increase in traffic volume of up to six trips per day (for a staff of three, including morning and evening trips). There would be additional irregular increases in traffic volume due to scheduled and unscheduled maintenance, such as trucks delivering water for panel washing. The additional traffic volume generated during operations and maintenance would be a long-term increase in traffic volumes and would not decrease or disrupt existing primary access on public roads through the area nor would it affect the LOS.

Decommissioning

Typical activities during decommissioning would include facility removal, breaking up of concrete pads and foundations, removal of access roads that are not maintained for other uses, and revegetation of the site. Short-term increases in the use of local roadways would occur during the decommissioning period from the transport of heavy equipment and labor force. Heavy equipment would remain at the site until reclamation is completed, and the labor force would be expected to add no more than 24 trips a day to local roads (assuming 12 people each driving to and from the site). Overweight and oversized loads could cause short-term disruptions to local traffic.

4.13.2.4 Alternative 4: Modified Site Layout (Phases I and II)

Short-term and long-term effects during Phases I and II under Alternative 4 would be slightly less than those identified under Alternative 3. Both Alternative 3 and 4 have identical construction durations, and the difference between the total areas graded and developed is five acres less for Alternative 4 compared to Alternative 3. In addition, the proposed energy generation for both alternatives would be the same at 45 MW.

4.13.2.5 Alternative 5: Smaller Project

This alternative would reduce the output of the solar power plant from 45 MW to 30 MW and also reduce the size of the developed area from 433 to 238 acres (Figure 2-5). This alternative would develop 120 acres of the project area west of Santa Fe Fire Road, would relocate Zircon Road, would develop 108 acres east of Santa Fe Fire Road, but would not develop the area south of the relocated Zircon Road.

Similar to Alternatives 3 and 4, Alternative 5 would require an amendment to the CDCA Plan to change the ROW designation to suitable for solar energy development.

Effect TRAN-1: Short-term effects on traffic volume as a result of construction

Implementation of Alternative 5 would result in similar effects to traffic volume as Alternative 3. The number of trips from workers and construction equipment as well as the delivery of supplies at the peak of construction would be the same as under Alternative 3; however, the effect would be for a shorter period since the construction phases under this alternative are shorter than the construction phases under Alternative 3. Implementation of MM TRAN-1 would ensure there would be no effect to the LOS.

Effect TRAN-2: Short-term effects on access and road conditions as a result of construction

Implementation of Alternative 5 would result in similar effects as Alternative 3. The effects to Foothill Road, Santa Fe Fire Road, and Zircon Road would be the same. There would be short-term traffic disruptions due to oversize loads. However, since this alternative is smaller than Alternative 3, this disruption would be for a shorter period of time. Effects on access and road conditions would be reduced by implementing MM TRAN-1 and MM TRAN-2.

4.13.3 Cumulative Effects

Impact Methodology

For the cumulative effects analysis, a CESA has been identified to address the cumulative effects for transportation. Cumulative effects can result from individually minor but collectively significant actions taken over time. Major past, present, and reasonably anticipated future land uses and disturbances in the area have been identified in Section 3.18 and include energy generation, military uses, commercial and residential developments, and roadway improvements. Dispersed recreation (including special motorized vehicle events), as well as residential and commercial development, also occur in parts of the CESAs.

Geographic Extent

The CESA for transportation is restricted to the 10-mile radius around the project area since this would encompass all the surrounding roads and intersections that could be affected by the project.

Past, Present, and Reasonably Foreseeable Projects and Changes

Cumulative effects on transportation may be caused by the following projects:

- LSR Pisgah LLC—CACA 50704;
- FPL Energy—CACA 47043;
- UPC Wind Management—CACA 47102;
- West Fry Wind, LLC (FPL Energy)—CACA 48902;
- Solel Inc.—CACA 50150;
- LSR Pisgah LLC—CACA 50706;
- Johnson Valley feature film shoot; National Geographic documentary on venomous snakes;
- “Beyond Productions”—three-day reality TV film shoot for the History Channel—CACA 50957;
- Caltrans Camprock Rd./SR 247 Bridge and Road Realignment Right-of-Way;
- Tomasheski Black Gold Exploratory Trenching—516 DM 11.9 F(9);
- Cove Road Right-of Way; Pave and Widen Access to Private Land;
- SB-3 Rabbit Springs Solar, LLC P200900655;
- SB-1 Boulevard Associates-Next Era/Lucerne Valley P200900663/CF;

- SB-2 Granite Wind (2)—CACA 048254;
- Map ID No. SB-25 Parcel Map 186 to create two parcels 550 acres;
- Map ID No. SB-26 SPP to add a wood grinding storage and distribution;
- Map ID No. SB-28 CUP to establish a 90-foot monopalm tower;
- Map ID No. SB-29 CUP to establish an asphalt plant;
- Map ID No. SB-30 TPM 18506;
- Map ID No. SB-31 TPM 18452;
- Map ID No. SB-32 TPM 18018;
- Map ID No. SB-34 TPM 18531;
- Map ID No. SB-35 TPM 17919;
- Map ID No. SB-36 TPM 19099;
- Map ID No. SB-44 TPM 18691; and
- Map ID No. SB-61 TPM 17569.

Cumulative Impact Analysis

No long-term direct effects were identified for transportation systems or motorized vehicle access. The project would reroute Zircon Road and replace the access with another equal access as a designated route of travel. Given that the project would not cause direct or indirect effects, no cumulative effects on transportation or motorized vehicle access would result from the project.

4.13.4 Residual Effects

Under all action alternatives, there would be short-term and long-term increases in traffic volume that could not be eliminated completely through mitigation. These increases would be very small and would not affect the LOS of any road in the area.

4.14 Human Health and Safety/Hazardous Materials

This section discusses the effects on human health and safety that may occur with implementation of the Proposed Action or alternatives. First, the criteria used to identify and analyze effects are presented; second, potential effects are discussed, and agency recommended mitigation measures are presented; third, a discussion of residual and cumulative effects is provided.

4.14.1 Indicators

The project could affect human health and safety by exposing the public and the environment to hazardous materials. Effects on human health and safety would occur if the project would:

- Use, store, transport, or dispose of petroleum products or hazardous materials in a manner that results in a release to the aquatic or terrestrial environment in an amount equal to or greater than the reportable quantity for that material or that creates a substantial risk to human health;
- Expose human or ecological receptors to potentially hazardous levels of chemicals or explosives due to the disturbance or unearthing of contaminated soils or groundwater of hazardous waste into soils.
- Expose workers to contaminated or hazardous materials at levels in excess of those permitted by the Federal Occupational Safety and Health Administration (OSHA) in CFR 29, Part 1910, and the California Occupational Safety and Health Agency (Cal/OSHA) in CCR Title 8, or expose members of the public to direct or indirect contact with hazardous materials from project construction or operations; or
- Expose people or structures to a risk of loss, injury, or death involving electrocution or cause excessive exposure to wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

4.14.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative.

4.14.2.1 Alternative 1: No Action/No Plan Amendment

Under NEPA, the BLM must consider an alternative that assesses effects that would occur if the project were not approved and the application rejected. The No Action Alternative assumes that the ROW application is denied and the CDCA Plan is not amended. Under this alternative, the project would not be constructed, and there would be no project-related effect on human health or the environment.

4.14.2.2 Alternative 2: Land Use Plan Amendment

Alternative 2 would deny the ROW application, but the CDCA Plan would be amended to classify the site of the project as either suitable or unsuitable for large-scale solar development.

Under this alternative, the project would not be constructed, and there would be no project related effect on human health or the environment.

4.14.2.3 Alternative 3: Proposed Action

The Proposed Action (Alternative 3) would have no indirect effects. The following discussion identifies potential direct effects from construction, operation and maintenance, and decommissioning of the Proposed Action.

Effect HAZ-1: Use, store, transport, or dispose of petroleum products or hazardous materials in a manner that results in a release to the aquatic or terrestrial environment in an amount equal to or greater than the reportable quantity for that material or that creates a substantial risk to human health.

Construction Phase I and II

During construction of all components of the Proposed Action, hazardous materials, such as vehicle fuels, oils, and other vehicle maintenance fluids, would be used and stored in construction vehicles. There would be no fuel stored on-site. Small quantities of herbicides would also be used for weed control. Minor spills and leaks of hazardous materials from vehicles or equipment could occur, which could result in exposure of the public or wildlife to contaminants. Because the quantities of materials to be used on-site would be relatively small, any spill would have localized effects. Since there are no on-site permanent surface water bodies, any potential contamination would be limited to soil contamination.

In order to reduce the potential for spills and leaks of hazardous materials and reduce the severity of the effect in the event of an inadvertent spill, the Applicant would implement their Spill Prevention and Response Plan, which outlines the procedures to avoid spills and what the Applicant would perform if a spill occurred. The Applicant would also be required to implement a SWPPP. Among other measures, the SWPPP would discuss where hazardous materials would be stored during construction and the protective measures, notifications, and cleanup requirements for accidental spills or other releases of hazardous materials.

With implementation of the Applicant's Spill Prevention and Response Plan and the SWPPP and compliance with all applicable federal, state, and local regulations addressing hazardous materials and wastes, the Applicant would use, store, transport, and dispose of petroleum and/or hazardous material in manner designed to prevent a potential release to the aquatic or terrestrial environment. If a release were to occur, proper implementation of the Spill Prevention and Response Plan and the SWPPP would limit the area that could be contaminated and ensure that any release is cleaned up in a manner that complies with federal, state, and local regulations.

Operations and Maintenance (Phases I and II)

The operation and maintenance of the Proposed Action would involve the periodic and routine transport, use, and disposal of minor amounts of hazardous materials, primarily fuel and lubricating oils. Minor spills or releases of these hazardous materials could occur due to improper handling, storage, or maintenance, leading to potential soil or groundwater contamination. The Applicant anticipates also using small quantities of herbicides on-site for weed control. Material safety data sheets would need to be available on-site for all hazardous chemicals used on the site. A Spill Prevention and Response Plan would be implemented for those hazardous materials stored on-site during operations.

During operation, leaks or spills could occur if the transformers at the substations were damaged from a seismic event, fire, or other unforeseen incident. However, leaks would likely be contained within the walls of the substation and the transformers would have biodegradable oil.

Underground storage tanks would not be used in the operation of the facility. Any stored liquids would be properly stored in aboveground storage areas and would be contained in structures on-site.

If more than minor amounts of hazardous materials would be used on the Proposed Action site, the operator would be required to file written hazardous material handling plans with the San Bernardino County Fire Department, including a hazardous materials business plan, 30 days prior to the start of Proposed Action operations, and the California Accidental Release Prevention Risk Management Plan, which must be submitted 90 days prior to the start of operations (CES 2009).

With the implementation of a Spill Prevention and Response Plan and adherence to and compliance with federal, state, and local regulations addressing hazardous and nonhazardous waste, effects associated with release of hazardous materials on the aquatic or terrestrial environment in an amount equal to or greater than the reportable quantity for that material would not create a risk that would be harmful to human health or the environment.

Decommissioning

The effects for decommissioning of the Proposed Action are identical to those described in the above section, with the exception of the potential disposition of the PV system materials. Hazardous materials are used in the manufacture of PV system materials and in the equipment used during their assembly. The circuitry and inverters of solar panels may contain hazardous materials at levels below those regulated by the State of California or the EPA, and emerging thin-film and nanotechnology-based cells pose unknown health and environmental dangers. To address concerns that disposal of materials may result in an increased risk to human health or the environment, the Applicant would develop a recycling option that does not contribute to the overall waste load on local landfills (MM HAZ-1).

MM HAZ-1: Solar PV Cell Recycling Commitment. The Applicant would commit to return solar panel products to the original manufacturers, or send them to a certified recycling facility, after the solar PV cells are decommissioned. Solar panel material would be recycled, in compliance with local standards and California Hazardous Waste Control Law.

With the implementation of MM HAZ-1, the Proposed Action would not contaminate soil or groundwater or expose to humans or wildlife at levels that would be expected to be harmful.

Effect HAZ-2: Expose human or ecological receptors to potentially hazardous levels of chemicals or explosives due to the disturbance or unearthing of contaminated soils or groundwater of hazardous waste into soils.

The site is undeveloped and vacant and has never been officially used for any commercial, agricultural, or industrial purposes. A review of federal and state databases confirmed that the site is not located on or near a hazardous materials site (DTSC 2009). In addition, based on the fact that the site has never been used, agricultural pesticides and herbicides have not likely been used on the site. Motor oil cans and three bottles, labeled as Clorox or Purex, were found on the site during the cultural resource inventory. The Clorox or Purex bottles appear to have

been of household size (32 ounce) (Chambers Group 2009). It is not known whether any of these containers still contain product. Soils and groundwater on the site have not been sampled and characterized. Groundwater is expected to occur at an average of 350 feet below ground surface.

It is unlikely that a hazard to the public or environment would occur as a result of soil disturbance at the site during construction of the Proposed Action; however, the public or construction workers could encounter hazardous wastes that may exist on the site. Disturbance of groundwater is also not expected to occur during site construction because foundations would not be drilled to these depths. The site has not been fenced or secured, and there is a potential chance that illegal dumping has occurred on the site, and transients have been known to use the area. For example, two mobile homes were located on the site for an unknown period of time. They have since been removed. Therefore, there could be other areas of the site with small amounts of contaminated soil to which the public, workers, or wildlife could be exposed. To reduce potential exposures to contaminated soils, the Applicant shall implement the following procedures:

MM HAZ-2: Characterize Any Discarded Hazardous Material/Waste that is Present On-site as well as Any Discolored or Odorous Soil to be Excavated. To ensure that workers, the public, and wildlife are not exposed to potential contaminants, it is recommended that:

- A trained hazardous materials specialist inventory, collect, and properly dispose of all hazardous wastes that have been identified at the site; and
- If soil is unearthed that is discolored or has an odor that work be stopped in that area. The soil should then be sampled and characterized prior to further site excavation activities in the area with discolored or odorous soils. If the soil is found to be contaminated based on federal or state regulations, then the Applicant should implement the appropriate and relevant procedures to properly characterize, contain, and dispose of the contaminated material.

With implementation of MM HAZ-2, the Proposed Action would not expose people or wildlife to potential hazardous wastes or contaminants in the soil at levels that would be expected to be harmful.

HAZ-3 Expose workers to contaminated or hazardous materials at levels in excess of those permitted by the Federal Occupational Safety and Health Administration (OSHA) in CFR 29, Part 1910, and the California Occupational Safety and Health Agency (Cal/OSHA) in California Code of Regulations (CCR) Title 8, or expose members of the public to direct or indirect contact with hazardous materials from Proposed Action construction or operations.

With implementation of the Applicant's Site Safety Plan, MM HAZ-2, Spill Prevention and Response Plan, the SWPPP, and MM HAZ-1 and MM HAZ-2, the Proposed Action would not expose workers to contaminated or hazardous materials at levels in excess of those permitted by the Federal OSHA in 29 CFR, Part 1910, and Cal/OSHA in CCR Title 8, or expose members of the public to direct or indirect contact with hazardous materials from construction, operations, and decommissioning.

Effect HAZ-4: Expose people or structures to a risk of loss, injury, or death involving electrocution or cause excessive exposure to wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

The Proposed Action may expose people or structures to a risk of loss, injury, or death involving electrocution or exposure to wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. Construction and operation of the Proposed Action would expose workers to potential electrocution hazards. However, the Applicant has committed to designing all medium- and high-voltage electric systems and components to National Electrical Code and National Electrical Manufacturers Association standards. Low-voltage direct current systems would be designed to best PV industry design practices. All construction work would be conducted in strict compliance with the Applicant's construction site safety plan and associated electrical and trenching safety plans. The Applicant conducts routine safety meetings and inspections to ensure compliance and to protect people and the environment.

Currently, fire hazards on the property are managed by the BLM. Fire hazards in the vicinity of the Proposed Action are designated as moderate by the California Department of Forestry and Fire Protection (CALFIRE). The solar facility may increase the potential for additional incidents related to fire and fire safety. Though none of the materials used for permanent portions of the Proposed Action are considered flammable (e.g., solar panels and anchors), electrical arcing and sparking from exposed wiring between panels or substations could result in a fire hazard. The Applicant would reduce the risk of this effect by maximizing the quantity of connection wiring that would be undergrounded. Fire alarms and portable fire extinguishers would also be provided to meet fire protection requirements (CES 2009). In addition, the isolation of the Proposed Action area in terms of vicinity to urban settlement would pose a minimal risk to life and property.

To decrease the hazard of fire, the Applicant would comply with the revised 2007 California building and fire codes and the San Bernardino County building and fire codes. The Applicant would be required to construct the Proposed Action in accordance with these state and local standards and submit designs and plans to San Bernardino County for review and consultation with regards to fire risk and hazards, among other considerations. The Applicant also would have to implement fire safety measures, in accordance with OSHA Safety and Health Regulations for Construction. Construction employees and those working with electrical equipment would follow electrical safety-related work practices requirements in Subpart S of 29 CFR, Part 1910, Sections 1910.331-1910.335, of OSHA, to include protective measures and equipment for employees whose occupations require them to work directly with electricity, including rubber insulating gloves, hoods, sleeves, matting, blankets, line hoses, and industrial protective helmets. The Applicant would also consult the CALFIRE Solar Photovoltaic Installation Guideline for additional consideration of state guidance for solar PV systems to include markings, access, pathways, smoke ventilation, location of DC conductors, and ground mounting.

In addition, implementation of fire prevention training and measures, as recommended for MM HAZ-3, would ensure that measures would be taken to address potential fire hazards.

MM HAZ-3: Fire Prevention Training and Measures. The Applicant would implement the following measures to address potential fire hazards in the Proposed Action area:

- *Fire Prevention Training.* The Applicant would coordinate with the California Office of the State Fire Marshall to provide PV training to county fire responders, construction, operational, maintenance staff. The intent of this training would be to familiarize both

responders and workers of the codes, regulations, associated hazards, and mitigation processes related to solar electricity. This training would include techniques for proper system shutdown and fire suppression procedures for PV systems.

- *Fire Prevention Measures.* The Applicant would employ the following measures during construction and operation of the Proposed Action:
 - Work crews would be required to park vehicles away from flammable vegetation, such as dry grass and brush. At the end of each workday, heavy equipment should be parked over mineral soil, asphalt, or concrete, where available, to reduce the chance of fire,
 - Fire suppression equipment, such as fire extinguishers, would be made available on the site at all times. All heavy equipment would be required to include mechanisms for fire suppression, including spark arresters or turbo-charging (which eliminates sparks in exhaust) and fire extinguishers, and
 - Smoking would be prohibited except in designated areas.

With the implementation of MM HAZ-3 and the other measures previously described, the risks of effects related to the exposure of people to electrocution or people and structures to wildland fires would be further reduced.

Effect HAZ- 5: Intentional Destructive Acts

As mentioned in Section 3.13, the facilities proposed under Alternative 3 present an unlikely target for an act of terrorism or sabotage and has an extremely low probability of attack, since this is a small scale, localized energy development project that serves a small area and is of low value at the national, political, or energy development level (BLM 2009). No mitigation has been identified.

4.14.2.4 Alternative 4: Modified Site Layout

The effects during Phases I and II under Alternative 4 would be similar to those identified under Alternative 3. Alternative 3 and 4 have identical construction durations; However, Alternative 4 would grade the equivalent number of acres as Alternative 3 and would grub and scarify 11 fewer acres. In addition, the proposed energy generation for both alternatives would be the same at 45 MW. The mitigation measures would be the same as for Alternative 3.

Regarding intentional destructive acts, the facilities proposed under Alternative 4 present an unlikely target for an act of terrorism or sabotage and has an extremely low probability of attack, since this is a small scale, localized energy development project that serves a small area and is of low value at the national, political, or energy development level (BLM 2009). No mitigation has been identified.

4.14.2.5 Alternative 5: Smaller Project

This alternative would reduce the output of the solar plant from 45 MW to 30 MW. It would also reduce the size of the developed area from 433 acres to 238 acres (Figure 2-5). This alternative would develop 120 acres west of Santa Fe Fire Road, would realign Zircon Road, would develop 108 acres east of Santa Fe Fire Road, but would not develop the area south of the relocated Zircon Road.

Similar to Alternatives 3 and 4, Alternative 5 would require an amendment to the CDCA Plan to change the ROW designation to suitable for solar energy development. Because the footprint is

smaller and the construction period shorter for this alternative, the likelihood of potential small spills would be reduced proportionately; however, the types of effects and related mitigation measures would be the same for this alternative as those for Alternative 3.

Regarding intentional destructive acts, the facilities proposed under Alternative 5 present an unlikely target for an act of terrorism or sabotage and has an extremely low probability of attack, since this is a small scale, localized energy development project that serves a small area and is of low value at the national, political, or energy development level (BLM 2009). No mitigation has been identified.

4.14.3 Cumulative Effects

Impact Methodology

For the cumulative effects analysis, a CESA has been identified to address the cumulative effects of human health and safety/hazardous materials. Cumulative effects can result from individually minor but collectively significant actions taken over time. Major past, present, and reasonably anticipated future land uses and disturbances in the area have been identified in Section 3.18 and include energy generation, military uses, commercial and residential developments, and roadway improvements. Dispersed recreation (including special motorized vehicle events), as well as residential and commercial development, also occur in parts of the CESAs.

Geographic Extent

The CESA for hazardous materials and public health and safety is the area surrounding the site of the project. All of the hazards identified in this section would be confined to the site or the immediate area due to the proposed mitigation measures and BMPs incorporated into the design of the Proposed Action and alternatives.

Past, Present, and Reasonably Foreseeable Projects and Changes

There are no other known projects within the area immediately surrounding the site of the project that would contribute to cumulative effects on human health and safety.

Cumulative Impact Analysis

Given the land activities surrounding the site, only local residences would have the potential to contribute hazardous materials to a spill or other accident involving hazardous substances from the project. Assuming that these residences would only have household chemicals, it is reasonable to conclude that there would not be a cumulative effect from hazardous materials as a result of Alternatives 3, 4, and 5.

Implementation of Alternatives 1 and 2 would not result in any activity at the site, and therefore, these Alternatives would not contribute to cumulative effects that would be generated by hazardous materials and hazardous waste or the increased risk of electrocution or fire.

4.14.4 Residual Effects

With implementation of the mitigation measures, no residual effects on human health and safety or the environment would result from the Proposed Action, Alternative 4 or Alternative 5 due to exposure to hazardous materials.

4.15 Social and Economic Conditions

This section discusses effects on the social well-being and economic conditions that may occur with implementation of the Proposed Action or alternatives. First, the indicators used to identify and analyze effects are presented, and second, potential effects are discussed. This discussion format is repeated for both Social (Section 4.15.2) and Economic (Section 4.15.3) Conditions. Finally, a discussion of residual and cumulative effects is provided.

4.15.1 Indicators

NEPA provides no specific thresholds of significance for socioeconomic impact assessment. Significance varies based on the setting of the project(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 rates. In addition, the regulations state that "...Effects include...cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect would be beneficial" (40 CFR 1508.8).

For the purposes of this analysis, the project would affect social and economic conditions if it would:

- Result in a permanent or temporary population increase larger than local services, infrastructure, or population can accommodate or
- Result in a tax burden to local residents not offset by the project's generation of new public revenues.

4.15.2 Social

This section discusses potential effects to the social well-being of groups representing the concerns of area stakeholders. Affects to the social welfare of these groups may potentially occur during implementation of the project alternatives. Potential social effects described in terms of effects to social well-being relate to how a particular social group, individual or stakeholder interprets how the project may affect their environment and how such an effect relates to the integrity, quality use, and enjoyment of socioeconomic resources. Stakeholder comments received and evaluated during the scoping process were reviewed to determine the values and quality of life concerns that would influence the social well-being of the groups. Resources are broadly defined and can include for example, historically used open spaces and quality habitat supporting recreation and wildlife appreciation and other resources necessary to maintain the historic quality of life that influences the social well-being of these stakeholders. Social well-being can potentially be affected by each Phase of the project (e.g., construction, operations and maintenance, or decommissioning). Social well-being can also be influenced by the level of participation and perceived degree of control that stakeholders have over their environment, its resources, and the government institutions that have stewardship obligations to manage these resources in a sustainable manner.

4.15.2.1 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative.

Alternative 1: No Action (No Project/No Plan Amendment)

Under NEPA, the BLM must consider an alternative that assesses effects that would occur if the project were not approved and the application rejected. The No Action Alternative assumes that the ROW application is denied and the CDCA Plan is not amended.

The social opportunity cost of the land relates to the uses, functions, and services that the project's encumbered land would provide to the community and inhabitants in the absence of building and operating the solar plant. The former uses of this land are not necessarily the same as future uses without the project. The BLM has indicated that under the No Action Alternative, the land that would have been occupied by the solar plant footprint would be allowed to remain undeveloped in the future, and this land would continue to provide the following historic services and functions (BLM 2009):

- Serve as a rural undeveloped area for visual resources;
- Provide habitat for species, including threatened and endangered species, such as the desert tortoise; and
- Provide a site with historic cultural resources related to mining and other human activities.

Under the No Action Alternative, the project would not be constructed, and there would be no effect on social and economic conditions.

Alternative 2: Land Use Plan Amendment

Alternative 2 would deny the ROW application, but the CDCA Plan would be amended to classify the site of the project as either suitable or unsuitable for large-scale solar development. Under this alternative, the project would not be constructed, and there would be no effect on social and economic conditions.

Alternative 3: Proposed Action

The following section discusses direct and indirect effects that may result from implementation of the Proposed Action. Potential effects from all of components of the Proposed Action during construction, operation and maintenance, and decommissioning are discussed with respect to population and housing, economic base, public services and utilities, tax revenues to local jurisdictions, property value effects, and consistency with applicable land use plans.

Demographics and Social Trends

Population and Housing

Construction (Phases I and II)

Construction would be expected to have a short-term, beneficial effect on the Lucerne Valley's population level. The effect would not cause a temporary population increase that would

necessitate additional local public services or infrastructure capacities that could not be provided from existing resources.

Construction during both phases would require only a peak labor workforce of 45 workers. Some workers would be local (i.e., permanent residents of San Bernardino County), but it is expected that some would be migrating to the work site from outside of the area. Given the short length of each construction phase, it is unlikely that the transient workforce component would migrate to the area with families and dependents. Therefore, there would be no noticeable short-term population effect and no effect on any public service capacities or level of service standards.

Construction is expected to have a beneficial effect on the Lucerne Valley's housing resources. The workers who migrate to the area would likely stay in hotels or motels and would use RV facilities and campsites. Since there are only a few workers who are anticipated to migrate to the area, the temporary housing stock within both Lucerne Valley and the surrounding Victor Valley area is sufficient to accommodate these workers. Hotels and motels within the immediate vicinity and within commuting distance to the site of the Proposed Action would receive the benefit of increased occupancy and related spending from temporary workers; therefore, there would be a short-term beneficial effect.

Operations and Maintenance (Phases I and II)

The operational phase of the Proposed Action would be anticipated to have a long-term beneficial effect on the area's population levels and housing stock. Assuming Phase I and II are both built, the Proposed Action would be expected to permanently employ three full-time workers. For the cleaning of panels, quarterly or semiannual teams of temporary maintenance workers would be deployed sporadically. It is assumed that these workers would be hired from within the area.

Affected Groups and Attitudes

Lucerne Valley Economic Development Association (LVEDA): Under Alternatives 1 and 2, the LVEDA would not achieve the compatible infrastructure development goals that form part of this group's mission. There would be no physical effect on the group although its infrastructure goals and group mission (i.e., influencing its sense of purpose and social well-being) would have to be satisfied through an alternative project. Under Alternative 3 the social well-being of LVEDA (and its representatives) could be enhanced because compatible sustainable infrastructure development would be implemented within the Lucerne Valley. Alternative 4 would have the same effect to the Proposed Action site since only a few acres less would be developed. Alternative 5 would have the same effect as Alternative 3 since the alternatives are close enough in size where short term and long term effects would not change.

Environmental Groups / Nongovernment Organizations (NGOs): Under Alternatives 1 and 2, because the land (comprising the footprint of the Proposed Action) would continue to provide its historic services and functions in an unabridged form (BLM 2009), environmental groups would most likely experience a positive sense of well-being from these alternatives as the land would retain its rural desert qualities, and there would be no effect on visual resources nor encroachments or alterations to any habitats. The land would continue to provide habitat for species, including threatened and endangered species, such as the desert tortoise; and also continue to provide a site with historic cultural resources related to mining and other human activities. Under Alternative 3, the project footprint would change the historic relationship that these users have with the land, but would not necessarily alter it in a detrimental manner. There

is a possibility that some positive aspects of social well-being associated with the use and enjoyment of select acreage of wildlife habitat that is taken over by the project footprint could be affected both on a short- and long-term basis. However, mitigation measures can reduce some of these potential negative social well-being effects (See Recreation Section). Alternatives 4 and 5 would have a similar effect as Alternative 3, although Alternative 5 would have a smaller footprint and, therefore, less of an adverse effect.

Recreational Users: Under Alternatives 1 and 2, recreational users would continue to have unfettered use of the public property where historic activities such as OHV use, horseback riding, hiking, and flora and fauna viewing and appreciation take place. The resources attracting these users would be maintained in a historic unaltered form. There would be no negative effects to the social well-being of these users under Alternatives 1 and 2. Under Alternative 3, the project footprint would change the historic relationship that these users have with the land, but would not necessarily alter it in a detrimental manner. There is a possibility that some positive aspects of social well-being associated with the use and enjoyment of select acreage of wildlife habitat that is taken over by the project footprint could be affected both on a short- and long-term basis. However, mitigation measures can reduce some of these potential negative social well-being effects (See Recreation Section). Alternatives 4 and 5 would have a similar effect as Alternative 3, although Alternative 5 would have a smaller footprint and, therefore, less of an adverse effect.

Local Private Land Owners / Residents / Large Lot Owners: The social attitudes within this group are diverse, and the likely social welfare effects that are generated by each alternative would be varied as well. Under Alternatives 1 and 2, the social well-being of residents who embrace solar energy infrastructure development within the Lucerne Valley would be affected in various ways. Some residents who support full-fledged development of renewable energy potential on public lands would feel discouraged and disappointed under Alternatives 1 and 2. Other residents who oppose Alternative 3 would feel vindicated, and their social well-being would be enhanced as the Proposed Action would not be carried out under Alternatives 1 and 2. Some residents who oppose Alternative 3 would experience a positive sense of satisfaction or enhanced social well-being under Alternatives 1 and 2. It is highly likely that social attitudes run the gamut from being pro-renewable energy development, to being against a change to the desert environment, to being indifferent to the proposed development. Some local land owners are also concerned about permanent changes to the natural high desert environment, wildlife, and potential effects to property values. Under Alternatives 1 and 2 these latter concerns would not have to be realized by residents who harbor may these views. Alternatives 4 and 5 would have the same effect as Alternative 3.

Project Workers and Suppliers to the Renewable Energy Industry: Under Alternatives 1 and 2, project workers and suppliers to the industry would not have the opportunity to contribute to the construction and operation of the solar plant, and their sense of social well-being would be affected by the uncertainty surrounding the loss of potential economic opportunities. However, under Alternative 3, the group would experience a positive sense of social well-being as their resources, skills, and goods and services could potentially be mobilized to build, operate, and sustain the solar plant. Alternative 4 would have the same effect and Alternative 3 since the same number of workers and suppliers would be required to construct the project. Alternative 5 would have a similar effect as Alternative 3, although the footprint would be smaller and require fewer materials.

Utility Off-taker and End-use Energy Consumers: Under Alternatives 1 and 2 the utility (or wholesale purchaser and / or distributor) would not have the energy supply that would have

been generated by the solar assets in the Lucerne Valley. Alternative renewable energy generation projects would have to be developed elsewhere in order to provide a positive sense of well-being to this stakeholder associated with processing and delivering the electricity output to final users. Under Alternative 3, the utility/wholesale processor would experience a positive sense of social well-being and satisfaction by knowing that they are contributing to California's renewable energy generation portfolio targets for electricity generation and earning profits. Under Alternatives 1 and 2, final end-use customers would not realize the benefits of the renewable energy solar farm's output, and would not have the sense of social well-being that may come from knowing that a portion of their total regional demand is being met by emission-free generated power. Substitute and alternative power supplies would have to be sourced to meet the portion of the electricity power demand that the solar farm would have supplied to the power grid in California. Under Alternative 3 the final end use customers would enjoy the social benefit of having a portion of their final demand met from renewable solar resources. The social benefit relates to a sense of satisfaction that a portion of their final demand is derived from emission-free solar power generation assets. Alternatives 4 and 5 would have a similar effect as Alternative 3; however, Alternative 5 would generate less renewable power.

Civil Rights

No civil rights effects associated with age, race, creed, color, national origin or sex have been identified.

4.15.3 Economics

This section describes potential effects to the economy during the construction and operational phases of the Proposed Action.

Economic Base: Income, Earnings, and Employment

Construction (Phases I and II)

Construction of Phases I and II of the Proposed Action is expected to have a short-term beneficial effect on the regional economy and area personal income and employment levels. Construction of Phase I would mobilize resources (manpower and spending on goods and services) for eight months that would provide a short-term beneficial stimulus to San Bernardino County. Construction of Phase II would extend the stimulative effect to 16 months.

Phase I of the Proposed Action is expected to cost approximately \$90 million dollars. Of this amount, an estimated \$20 million would be spent directly on local content goods and locally available services. It is likely that select materials (such as concrete and aggregates, and select earthmoving equipment) would be purchased or leased from within the area as some of these items are readily available, and it would be cheaper to procure them locally. The majority of equipment is expected to be imported from outside of the Lucerne Valley area. California has a large number of companies involved in manufacturing and installing solar systems, and the supply chain is extensive (Solar Energy Industries Association 2008).

To estimate the total economic effects, including indirect and induced effects, the Impact Analysis for Planning, Inc., model (IMPLAN) multipliers for San Bernardino County were used (Southern California Association of Governments 2009). Table 4.15-1 shows the estimated total economic effects using the multipliers.

Assuming that \$20 million of construction phase direct spending (related to wages and purchases of materials and equipment) occurs in San Bernardino County, the initial \$20 million

in direct local content expenditures would generate a grand total of \$36.1 million in total output to the region. Indirect effects include the effects occurring along the supporting supply chain as goods and services are purchased from vendors and subcontractors supporting the installation. Induced effects represent the cumulative effects from household spending, reflecting labor earnings from direct and indirect related economic activity. San Bernardino’s total personal income was approximately \$56 billion in 2007 (Bureau of Economic Analysis 2009).

Table 4.15-1 Order of Magnitude Economic Effect Estimates for San Bernardino County, Construction Phase

	Million Dollars
Total cost of Proposed Action	\$90.0
Estimated local content goods and services:	
Direct effects	\$20.0
Indirect effects	\$6.0
Induced effects	\$10.1
Total effects (total output):	\$36.1

Source: Southern California Association of Governments 2009

Notes: Based on Impact Analysis for Planning, Inc., Type II multipliers for San Bernardino County, 41 Other New Construction. Economic effects are expressed in terms of total industrial output generated from Phase I.

At the peak of construction activity, the Proposed Action is expected to employ a workforce of 45 workers for a three-month period. Figure 4.15-1 shows the construction workforce size by month of installation.

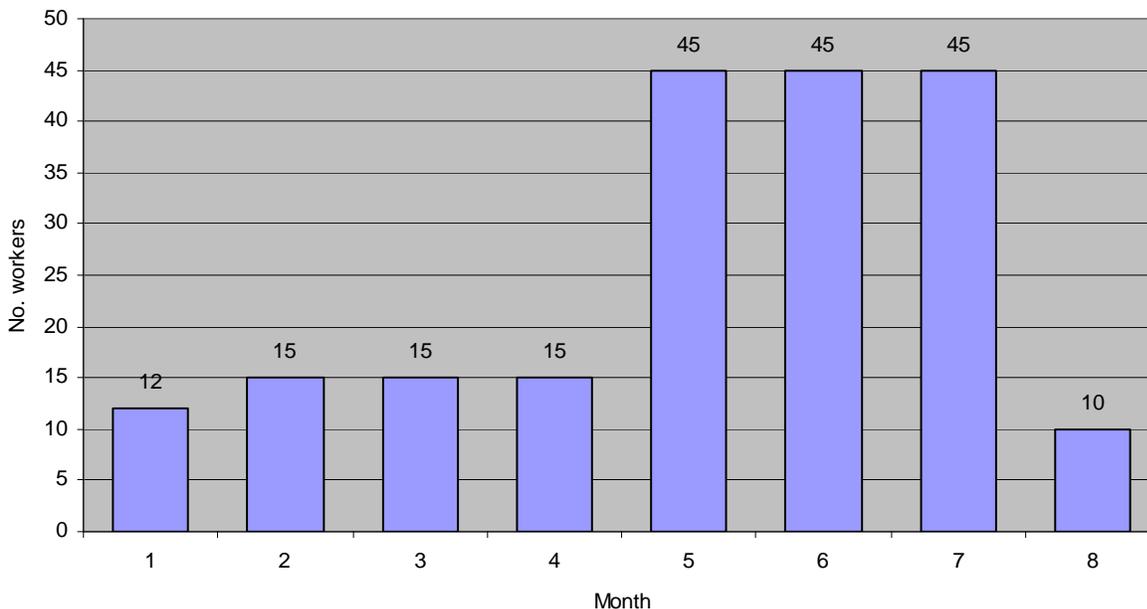


Figure 4.15-1 Construction Labor Force by Month

On average, 25 construction and supervisory personnel would be required on-site for approximately eight months to build Phase I, with 45 personnel being required at peak times. During Phase II, this manpower loading would be repeated.

Operations and Maintenance (Phases I and II)

The operations and maintenance phase of the Proposed Action is expected to have a long-term, beneficial effect on the regional economy and area personal income and employment levels. The effect would recur annually and would last for the 30-year life of Proposed Action assets.

Assuming Phase I and II are both built, the Proposed Action would employ three permanent staff, who would most likely be hired locally. These workers would earn incomes and spend money within the community, which would be beneficial to the local economy. The solar plant would also require sporadic maintenance for array cleaning and washing, vegetation clearing, and plant, equipment systems, and infrastructure monitoring. These operational and maintenance activities would require temporary manpower and involve some contractual spending, but this activity would also have a relatively minor effect on the area's economy.

Solar plants are characterized by large up-front capital costs and relatively small running annual costs. The operational and maintenance expenditures required to sustain the plant are relatively small, estimated at \$400,000 per year. Assuming Phases I and II are both constructed, over the 30-year life of the plant, the present value of these annual expenditures would total \$6.15 million (without escalation) and \$8.65 million (with a 2.5 percent escalation factor), applying a five percent discount rate. The annual \$400,000 spending would also be recycled within the local economy from re-spending activities and would also generate a multiplier effect. The direct annual operation and maintenance spending of approximately \$400,000 per year would generate indirect and induced effects after the multiplier had run its course. Table 4.15-2 shows the estimated operational period economic effects.

Table 4.15-2 Order of Magnitude Economic Effect Estimates for San Bernardino County, Operation and Maintenance

	Million Dollars
Annual direct spending (operations and maintenance)	\$0.40
Cumulative present value (30 yr. w/out escalation, 5% discount rate)	\$6.15
Cumulative present value (30 yr. w / 2.5%/yr. escalation, 5% discount rate)	\$8.65
Taxable leasehold interest	
Annual taxes (low)	\$0.945
Annual taxes (high)	\$1.080

Source: Raw data from the Applicant and San Bernardino County Assessors Office
 Range in annual taxes based on range in estimated effective tax rates.

Public Services and Utilities

The induced demand from the Proposed Action on public services during construction, operation and maintenance, and decommissioning would not result in extraordinary stresses placed on public service capacities or infrastructure that could not be met by existing and projected public resources. As explained below in more detail, adequate resources exist within San Bernardino County and the Lucerne Valley that can accommodate the Proposed Action's installation demands during construction. Furthermore, operations would not result in a noticeable population migration to the Lucerne Valley. In addition, over the long-term, the Proposed Action would generate annual taxes (from the leasehold interest) that would be sufficiently large enough to more than offset any new demands arising from operations.

Construction (Phases I and II)

The Proposed Action would be expected to have a short-term effect on public services during the construction of both phases. Construction is not expected to result in any undue burdens being placed on public resources that could not be met by existing service capacities and budgets.

Water and Wastewater

During construction of Phases I and II, some water would be required for soil compaction and dust control. Because grading would be limited, it is anticipated that the water requirements would be achievable without imposing any competing undue burdens on the area's existing groundwater or surface water resources. Wastewater is expected to be disposed of by a commercial sanitary service.

Fire and Emergency Medical Services

During a large-scale construction project, there is the potential for emergencies and accidents; however, the county has sufficient resources with which to handle any accidents or fire events. Therefore, it is unlikely that construction of Phases I and II would place any noticeable incremental demands on fire and emergency medical services, especially given their low probability of occurrence.

Medical

It is possible that accidents requiring ambulance services and hospital treatment may occur during the construction phase. The nearest local full service hospitals are in Apple Valley and Victorville. Given the safety plan and construction protocols to be followed, the probability of occurrence of any accidents and their frequency is low. Therefore, the hospital is expected to be able to fully accommodate any accidents requiring medical treatment and ambulance services within their current levels of staffing and resource deployment.

Police

The Applicant would employ private security guards during construction of both phases, who would be trained, uniformed, and unarmed. The guards would control ingress and egress of personnel and vehicles during construction and would guard against potential theft during non-operating hours. It is possible that during select phases of the installation, police services would be required during key mobilization of resources and select movements of materials (for example, to direct traffic at select intersections and to check permits). However, the demands placed on local police services during this phase are likely to be handled within normal business activities and scheduling and are not expected to require any new permanent staffing or unforeseen resource requirements.

Solid Waste

During the construction phase, nonhazardous solid waste would most likely consist of construction and other debris and would be trucked to the nearest transfer station or the nearest Type II landfill. The permitted maximum disposal of the Victorville Sanitary Landfill is 3,000 tons per day (California Integrated Waste Management Board 2009). It is unlikely that the solid waste generated over the course of construction would place any capacity burdens on the landfill's daily intake capacity.

Schools

Given the short-term nature of the construction (Phase I and II are together approximately 16 months in duration); it is unlikely that members of the construction work force who are not local would migrate to the area with their children or dependents. In addition, the peak construction work force (for an estimated three-month period; see Figure 4.15-1) is estimated to be 45 workers per month. The Lucerne Valley School District accommodates over a thousand pupils (Lucerne Valley Unified School District 2009). Therefore, the construction phase is not expected to burden the Lucerne Valley School District in a manner that would require any new investments in personnel, supplies, or facilities.

Operations and Maintenance (Phases I and II)

The Proposed Action would not be expected to have a noticeable long-term effect on public services during operations and maintenance. The solar plant would be a highly automated facility and would require only three permanent staff. In addition, long-term operations and maintenance requirements are not likely to tax public service capacities.

Water and Wastewater

During operations and maintenance, 10,000 gallons to 20,000 gallons for Phase I and between 12,000 gallons to 25,000 gallons for Phase II (22,500 to 45,000 gallons per year) would be required for panel washing. The water would be from off-site resources. Since the facility would be run by three permanent staff, there would be a minimal amount of wastewater generated, which would be easily accommodated by the plant wastewater systems.

Fire and Emergency Medical Services

The solar plant would be equipped with fire alarms and portable fire extinguishers. The plant also would have very few flammable components, and the risk of fire from operating activities is expected to be small. Therefore, it is unlikely that frequent fires requiring county-wide fire services would be necessary or that they would cause emergency fire and medical services to be deployed at a frequency that causes a sustained demand in public service capacities and incremental expenditures.

Police

The perimeter of the solar plant would contain an eight-foot-high security fence, and cameras would be used to survey the perimeter of the site for potential intruders. In addition, the Applicant would provide for nighttime security and therefore would not place any demands on local law enforcement.

Medical

It is possible that accidents requiring ambulance services and hospital treatment may occur during the operational phase. As discussed above, the nearest local full service hospital is the Bear Valley Community Hospital in Big Bear Lake. Given the small number of permanent staff, and the safety plan and construction protocols to be followed, the probability of occurrence of any accidents and their frequency is low. Therefore, the hospital is expected to be able to fully accommodate any accidents requiring medical treatment and ambulance services within their current levels of staffing and resource deployment.

Solid Waste

Since the facility would be run by three permanent staff, there would be a minimal amount of solid waste generated that could easily be accommodated by local solid waste services (collection, transfer, and disposal).

Schools

During operation and maintenance, it has been estimated that only three permanent employees would be needed to operate the solar plant. Given the small number of permanent employees, the operational phase would not result in any noticeable population migration to the area that would have any noticeable effect on future pupil enrollments and public school resources or facilities.

Tax Revenues to Local Jurisdictions

Construction (Phases I and II)

The Proposed Action would be expected to have a short-term beneficial effect on local jurisdiction tax revenues during the construction of Phases I and II. Direct, indirect, and induced spending generated initially by the direct purchases of goods and services during construction would generate sales taxes, and wages paid to workers during construction would generate payroll and income taxes. The majority of the capital costs would be for equipment costs, however, which are not local spending items. It is anticipated that the total local spending would be approximately 20 percent of Proposed Action cost. The potential one-time tax revenues to San Bernardino County would be derived from this portion of local spending.

Operations and Maintenance (Phases I and II)

Operations and maintenance of both phases of the Proposed Action would be expected to have a long-term beneficial effect on San Bernardino County's public revenues. Given the high level of automation and low maintenance requirements of the solar plant, it is likely that public revenues generated over the Proposed Action's useful life (attributable to the leasehold interest annual taxes) would exceed public expenditures arising from incremental public service demands related to operations.

As mentioned in the existing conditions section, the BLM provides payments in lieu of taxes (or PILT) that are federal payments to local governments that help offset losses in property taxes due to nontaxable federal lands within their boundaries. PILT payments help local governments carry out such vital services as firefighting and police protection, construction of public schools and roads, and search-and-rescue operations. The payments are made annually for tax-exempt federal lands administered by the BLM. The formula used to compute the payments is contained in the PILT Act and is based on population, receipt sharing payments, and the amount of federal land within an affected county. In fiscal year 2008, San Bernardino County collected \$2,877,981 in PILT total payments (US Department of the Interior 2009).

The Proposed Action's acreage and fixed assets in place would generate annually recurring taxes on the BLM leasehold interest over the 30-year operational life. These tax receipts would be beneficial to the local taxing jurisdictions and would sustain public services, providing a long-term benefit to residents and taxpayers.

In California, the Applicant that enters into a lease contract with the BLM for the exclusive right to operate a solar plant on BLM land would have a taxable possessory interest. All of the power-producing assets, structures, and other improvements that would be built would be valued at

their full fee value, subject to any specific exemptions or exclusions allowed by the California Revenue and Taxation Code. Depending on the type of power project, specific provisions of the Revenue and Taxation Code allow for certain new construction exclusions. For example, Section 73 describes the new construction exclusion that specifically applies to solar-generating facilities. Since the land would be owned by BLM, the value of the leasehold interest in the land would be taxable (as a taxable possessory interest) to the lessee and subject to Proposition 13. The improvements to the property would not be valued any differently on BLM land, as compared to privately owned fee land (San Bernardino County Assessor 2009).

The taxable basis of the property for leasehold interest purposes would consist of all real property, including land, structures, and fixtures and any personal property items. In San Bernardino County, the general tax levy is one percent of the taxable value on the roll, plus any voter-approved bonded indebtedness. As a practical matter (since the estimated taxes are forward looking) it is reasonable to also assume that a bonding levy would produce an effective tax rate that is above one percent. Since the Proposed Action would be located in the desert, a range estimate for the effective tax rate would most likely be between 1.05 and 1.2 percent of the total assessed value (San Bernardino County Assessor 2009). Applying the effective tax rates to the taxable value of the project assets of \$90,000,000 yields annual taxes owed to the county in the range of \$945,000 to \$1,080,000 (see Table 4.15-2).

Solar Energy Right-of-Way Rental Fees

Applications for solar energy projects are processed as right-of-way authorizations under Title V of the Federal Land Policy and Management Act (FLPMA) and require the payment of rent in accordance with the requirements of Section 504(g) of FLPMA and the provisions of 43 CFR 2806. The holder of a solar energy right-of-way authorization must pay an annual rent in conformance with the regulations (43 CFR, 2806.10[a]). Consistent with 43 CFR 2806.50, the BLM has developed a schedule to calculate rental fees for solar energy right-of-way authorizations. This rental schedule includes a base rent for the acreage of public land included within the solar energy right-of-way authorization and an additional megawatt capacity fee based on the total authorized megawatt capacity for the approved solar energy project on the public land administrated by the BLM. The base rent is expected to be paid to BLM on the date of issuance of the right-of-way authorization, consistent with the provisions of 43 CFR, 2806.11, and will be charged on the entire public land acreage described in the right-of-way authorization, regardless of the stage of development or operations. The megawatt capacity fee captures the increased industrial use value of the authorization, above the limited rural/agricultural land value captured by the base rent (BLM 2010).

The annual base and megawatt capacity fees were calculated over the construction and operational periods using a useful life of 30 years for the project assets. BLM Instruction Memorandum (IM) No. 2010-141 provides guidance on the base rental fee (calculated on a per acre basis) and the calculation method to estimate the megawatt capacity fee. The IM allows for a gradual phase in of the annual megawatt fee (payable on project startup and generation of power) that recognizes a reasonable and diligent testing and operational period and allows a five-year implementation of the megawatt capacity fee after the start of generation operations. By the fifth year and for subsequent years, 100% of the annual megawatt capacity fee is due. The BLM will also adjust base rents for states and counties that are used for solar energy authorizations each year, based on the Implicit Price Deflator-Gross Domestic Product (IPD-GDP) index. The IPD-GDP index is also used to adjust the linear right-of-way rental fee each year (43 CFR 2806.22[a]).

To calculate the annual base and megawatt capacity rental fees over the life of the Lucerne Valley Solar Project assets (30 years), the annual GDP implicit deflator inflation rate used to escalate the base rental and annual megawatt capacity fees was 2.3%. This expected inflation rate is lower than the post-war inflation average (3.4% per year) but reflects average annual inflation since 1990. Table 4.15-3 shows the parameters and assumptions used in the rental fee estimates, as well as the cumulative lifetime and average annual base and megawatt capacity rental fees.

Table 4.15-3 Calculation of Estimated BLM ROW Rental Fees for Lucerne Valley Solar Project
(Cumulative Fees Projected Over Operational Lifetime of Assets and Average Annual Fees)

Parameters & Assumptions Used in Cumulative Estimates	Value	Source
Project size (MW):	45	POD
Disturbed acres:	516	POD
County:	San Bernardino	POD
CY 2010 Base Rent Fee (per acre)	\$125.56	BLM Instruction Memorandum No. 2010-141
Megawatt Capacity Fee (Photovoltaic), (\$/MW)	\$5,256	BLM Instruction Memorandum No. 2010-141
Discount rate	5.0%	BLM Instruction Memorandum No. 2010-141
Expected (Projected) annual inflation escalator (IPD-GDP)	2.3%	Based on Average IPD-GDP inflation rate (1990 – 2010)
Expected Project Life (Years)	30	POD
ESTIMATED ANNUAL FEES		
Estimated Annual Fees	Cumulative Lifetime Annual Fees (2010 – 2033), n = 30	Average Annual Equivalent Fee (calculated over project lifetime)
Base Rent Fee	\$1,451,312	\$90,693
Megawatt Capacity Fee	\$4,180,553	\$261,243
Total Fees:	\$5,631,865	\$351,935

Notes:

POD = Plan of Development

Source: BLM 2010, US Department of Commerce, Bureau of Economic Analysis 2010

Given the project parameters and assumptions applied, it is estimated that base rental and megawatt capacity fees will total \$5.6 million in present value over the life of the solar assets.

Property Value Effects

Some stakeholders have voiced their concerns about the potential effects on adjacent property values from the installation of the utility scale solar plant. Given that very few utility scale plants have been installed in the US, there have not been any specific local empirical studies that have measured the actual effects on adjacent property values associated with proximity to a solar plant. However, several observations are worth noting that are relevant to assessing this potential effect. Usually where effects from proximity to infrastructure do affect property values, there is some causal nexus to the adjacent property from the plant or facility itself. In the case of utility-scale solar photovoltaics, adjacent property owners would not be subject to potential

emissions or particulates (associated with fossil fuel thermal facilities), because there would be none. In addition, noise or visual effects on property values would not be a stigma associated with the Proposed Action that would affect adjacent property owners in the rural desert setting. There would also be no risks associated with potential exposure to radiation that are associated with nuclear facilities.

To have an effect on property values and markets, there must be a project-related link or externality that either causes the direct effect on value or that is perceived by market participants who buy and sell properties as influencing values, whether it actually does have an effect. The site of the Proposed Action within a development corridor located near existing roads and transmission lines, away from residential development, functions as a form of built-in mitigation against potential effects on property values. Therefore, there would likely be no effect on property values.

While there are no comprehensive studies of the effects of utility scale solar plants on rural area property values, there is a recent comprehensive empirical study on wind farm facility effects to adjacent property values. The study looked at several dimensions of stigma or the perception that the view and noise emitted from wind towers and turbine would lower property values to adjacent home owners. The data intensive, regression-based statistical models developed and applied in the study failed to uncover any conclusive evidence of stigma from proximity to the wind towers. Home prices in the sample were not measurably affected by either the view of or the distance to the wind facilities (Hoen et. al, 2009).

Decommissioning

The potential effects on socioeconomic resources from decommissioning options are expected to be beneficial and alternatively either short-term or long-term, based on the particular option chosen.

It is possible that the Proposed Action may be upgraded with a new technology (to continue to exploit the area's strong solar radiation potential) at the end of its estimated 30-year life. If this option is chosen, the plant would continue to provide zero emission electricity to the regional grid and make lasting contributions to meeting the region's projected load growth. In addition there would be short-term construction-related benefits to incomes, employment, and output (from the upgrade project option). Over the long term, the lease would most likely be renewed and taxes would continue to be paid on this possessory interest, and the new upgraded plant would employ both permanent workers and sporadic operations and maintenance worker teams. If the site would continue to be used for solar power generation, there would also continue to be a positive social opportunity cost of the land.

It is also possible that the solar plant would be dismantled and the land made suitable for reclamation. Dismantling and reclamation/restoration activities would also provide a short-term stimulus to the local economy as special teams would be needed to safely disassemble the plant assets and restore the site to its original pristine condition. In addition, the underlying land would be freed up for other potential uses, including the historic uses identified by the BLM as the opportunity cost of the site of the Proposed Action.

Alternative 4: Modified Site Layout

Short-term and long-term effects during Phases I and II under Alternative 4 would be slightly less than those identified under Alternative 3. Both Alternative 3 and 4 have identical construction durations, and the difference between the total areas graded and developed is five

acres less for Alternative 4 compared to Alternative 3. In addition, the proposed energy generation for both alternatives would be the same at 45 MW

Alternative 5: Smaller Project

This alternative would reduce the output of the solar power plant from 45 MW to 30 MW and also reduce the size of the developed area from 433 to 238 acres (Figure 2-5). This alternative would develop 120 acres west of Santa Fe Fire Road, would relocate Zircon Road, would develop 108 acres east of Santa Fe Fire Road, but would not develop the area south of the relocated Zircon Road.

Similar to Alternatives 3 and 4, Alternative 5 would require an amendment to the CDCA Plan to change the ROW designation to suitable for solar energy development.

Effects during Phases I and II under this alternative would be similar to Alternative 5 as discussed above.

4.15.4 Cumulative Effects

Impact Methodology

For the cumulative effects analysis, a CESA has been identified to address the cumulative effects for social and economic conditions. Cumulative effects can result from individually minor but collectively significant actions taken over time. Major past, present, and reasonably anticipated future land uses and disturbances in the area have been identified in Section 3.18 and include energy generation, military uses, commercial and residential developments, and roadway improvements. Dispersed recreation (including special motorized vehicle events), as well as residential and commercial development, also occur in parts of the CESAs.

Geographic Extent

For this analysis, the CESA for cumulative effects on social and economic conditions would be local as well as regional. For example, residents and visitors may perceive that a change in the rural character of the Lucerne Valley was the result of the project and other projects, combined with the changes in the region that have occurred in the past. For this analysis, all of the projects identified on Table 3.18-1 are included since they will all contribute to changes in the rural character of the area.

Past, Present, and Reasonably Foreseeable Projects and Changes

All of the projects listed in Table 3.18-1 have been determined to have an effect on social and economic conditions.

Cumulative Impact Analysis

Given that many of the residents live there because of the area's rural character, the action alternatives combined with other changes in the landscape may permanently alter the rural feel of the community. Changes in economic conditions may be both beneficial and adverse. New local jobs may be created, which may provide economic benefits to the community, including revenues, but effects to recreation may adversely affect economic conditions.

The analysis shows that the action alternatives are consistent with the goals and objectives of the Lucerne Valley Community Plan relative to the community's desire to retain its rural desert character. Therefore, the action alternatives would not be expected to contribute to cumulative effects for social conditions.

Regionally significant cumulative effects are related to changes to the CDCA as a whole. BLM and other federal and non-federal entities have received hundreds of applications for renewable power, transmission lines, and non-energy related projects throughout the CDCA. Over time, if these projects are built, there will be enormous ramifications for the region's social and economic conditions. Within the CDCA as a whole, BLM alone has over 100 proposed solar, wind, and transmission projects that cover tens of thousands of acres. The action alternatives could convert up to 516 acres of the CDCA to a single use, which would cumulatively contribute to these other proposed actions. A beneficial social effect would be the addition of up to 45 megawatts of renewable, low carbon-emitting energy to California consumers, which would contribute toward California meeting its RPS.

The action alternatives would add up to 45 megawatts in renewable energy, which would provide the following net economic benefits:

- Zero emission power output sustaining projected load growth;
- Cumulative electric power output sustaining future economic growth;
- Aggregate construction phase and operational period benefits (i.e., jobs, incomes, and taxes);
- Aggregate short-term tax benefits related to sales taxes during construction and long-term taxes paid on leasehold possessory interests; and
- A larger developed land area and larger social opportunity cost of the land.

4.15.5 Residual Effects

During construction phases of the project, there would be short-term, beneficial residual effects on population and housing, the regional economy, and personal income and employment levels, public services, and tax revenues. During operation and maintenance phases, there would be long-term beneficial residual effects on population and housing, the regional economy, and personal income and employment levels, public services, and tax revenues. Effects on social and economic conditions from decommissioning are also expected to be beneficial.

4.16 Environmental Justice

This section discusses the effects on environmental justice that may occur with implementation of the Proposed Action or alternatives. First, the indicators used to identify and analyze effects are presented; second, potential effects are discussed; and third, a discussion of residual and cumulative effects is provided.

4.16.1 Indicators

The project would affect environmental justice if it would result in disproportionately high or adverse effects on minority or low-income populations.

4.16.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative.

4.16.2.1 Alternative 1: No Action/No Plan Amendment

Under NEPA, the BLM must consider an alternative that assesses effects that would occur if the project were not approved and the application were rejected. The No Action Alternative assumes that the ROW application is denied and the CDCA Plan is not amended. Under this alternative, the project would not be constructed, and there would be no adverse effect on minority or low-income populations.

4.16.2.2 Alternative 2: Land Use Plan Amendment

Alternative 2 would deny the ROW application, but the CDCA Plan would be amended to classify the site of the project as either suitable or unsuitable for large-scale solar development. Under this alternative, the project would not be constructed, and there would be no adverse effect on minority or low-income populations.

4.16.2.3 Alternative 3: Proposed Action

The Proposed Action would have no indirect effects. The following discussion identifies the potential direct effects of the Proposed Action from construction, operation and maintenance, and decommissioning activities for Phases I and II.

The Proposed Action is not expected to have a disproportionately high and adverse human health or environmental effect on minority and low-income populations in the Lucerne Valley.

The racial composition of the area within the Lucerne Valley area closest to the site (see Zip Code tabulation area [ZCTA] 92356 and Census Tract 104.05 in Table 3.16-1) did not contain minority or low-income disadvantaged communities exceeding 50 percent of the population. The site is within the rural high development corridor located near existing roads and transmission lines and is not proximate to an urban area where pockets of low-income minority communities would reside. Therefore, the Proposed Action would not result in imposing any disproportionate share of adverse effect on any racial, ethnic, or socioeconomic group.

Furthermore, there is no physical effect or output related to the Proposed Action that could have a disproportionately high and adverse human health or environmental effect on a given minority population (were that population in fact located within a range of potential contact).

4.16.2.4 Alternative 4: Modified Site Layout

Both Alternative 3 and 4 have identical construction durations, and the difference between the total areas graded and developed is five acres less for Alternative 4 compared to Alternative 3. In addition, the proposed energy generation for both alternatives would be the same at 45 MW. The racial composition of the area within the Lucerne Valley area closest to the site (see Zip Code tabulation area [ZCTA] 92356 and Census Tract 104.05 in Table 3.16-1) did not contain minority or low-income disadvantaged communities exceeding 50 percent of the population. The site is within the rural high development corridor located near existing roads and transmission lines and is not proximate to an urban area where pockets of low-income minority communities would reside. Thus, there would be no effect to minority or low-income populations.

4.16.2.5 Alternative 5: Smaller Project

This alternative would reduce the output of the solar plant from 45 megawatts to 30 megawatts. It would also reduce the size of the developed area from 433 acres to 238 acres (Figure 2-5). The western part of the project would develop 120 acres west of Santa Fe Fire Road. The eastern part of the project would develop 108 acres east of Santa Fe Fire Road, realign Zircon Road, but would not develop the area south of the relocated Zircon Road.

Similar to Alternatives 3 and 4, Alternative 5 would require an amendment to the CDCA Plan to designate the project area as suitable for solar energy development.

The racial composition of the area within the Lucerne Valley area closest to the site (see Zip Code tabulation area [ZCTA] 92356 and Census Tract 104.05 in Table 3.16-1) did not contain minority or low-income disadvantaged communities exceeding 50 percent of the population. The site is within the rural high development corridor located near existing roads and transmission lines and is not proximate to an urban area where pockets of low-income minority communities would reside. Thus, there would be no effect to minority or low-income populations.

4.16.3 Cumulative Effects

Impact Methodology

For the cumulative effects analysis, a CESA has been identified to address the cumulative effects for environmental justice. Cumulative effects can result from individually minor but collectively significant actions taken over time. Major past, present, and reasonably anticipated future land uses and disturbances in the area have been identified in Section 3.18 and include energy generation, military uses, commercial and residential developments and roadway improvements. Dispersed recreation (including special motorized vehicle events), as well as residential and commercial development, also occur in parts of the CESAs.

Geographic Extent

The CESA for environmental justice includes ZCTA 92356 and Census Tract 104.05. These areas were chosen because racial and economic data is available within these defined geographic extents.

Past, Present, and Reasonably Foreseeable Projects and Changes

None of the projects identified in Table 3.18-1 would have an effect on environmental justice.

Cumulative Impact Analysis

Construction, operation and maintenance, and decommissioning of the project would not result in short- or long-term cumulative effects on minority and low-income populations because the racial composition of the immediate area within the Lucerne Valley area closest to the site does not contain minority or low-income disadvantaged communities exceeding 50 percent of the population. As the direct analysis above has indicated that there are no direct effects on environmental justice, there cannot be cumulative effects. There are no populations in the cumulative effects study area that meet the requirements for environmental justice consideration.

4.16.4 Residual Effects

No residual effects on minority or low-income populations would result from implementation of the project.

4.17 Energy and Minerals

This section discusses the effects on energy and mineral resources that may occur with implementation of the Proposed Action or alternatives. First, the indicators used to identify and analyze effects are presented; second, potential effects are discussed; and third, a discussion of residual and cumulative effects is provided.

4.17.1 Indicators

The project would affect energy and mineral resources if it would:

- Restrict access to or the availability of mineral or energy resources or
- Result in excessive use of energy and mineral resources.

4.17.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. All effects discussed in this section are direct. No indirect effects were identified for this resource area.

4.17.2.1 Alternative 1: No Action/No Plan Amendment

Under NEPA, the BLM must consider an alternative that assesses effects that would occur if the project were not approved and the application were rejected. The No Action Alternative assumes that the ROW application is denied and the CDCA Plan is not amended. Under this alternative, the project would not be constructed, and there would be no adverse effect on energy and mineral resources.

4.17.2.2 Alternative 2: Land Use Plan Amendment

Alternative 2 would deny the ROW application, but the CDCA Plan would be amended to classify the site of the project as either suitable or unsuitable for large-scale solar development. Under this alternative, the project would not be constructed, and there would be no adverse effect on energy and mineral resources.

4.17.2.3 Alternative 3: Proposed Action

Effects that could result from the implementation of Alternative 3 during construction, operations and maintenance, or decommissioning activities associated with either Phase I or II are analyzed in this section.

Effect EAM-1: Restrict access to or the availability of mineral or energy resources within the project area

Access to some prospected or production sites for mineral or energy resources could be inhibited during construction; operations and maintenance; or decommissioning of the project; however, due to the lack of known mineral resources at the site, no effect on mineral or energy resources would occur. In addition, the Proposed Action would require energy and mineral resources for construction, operations and maintenance, and decommissioning. However, given the expected 30-year lifespan of this clean energy project, this would not be an adverse effect. Therefore, no mitigation measures are proposed.

Effect EAM-2: Development of the solar field may result in excessive energy use

The Proposed Action would require energy and mineral resources for construction, operations and maintenance, and decommissioning. However, given the expected 30-year lifespan of this clean energy project, this would not be an adverse effect. Therefore, no mitigation measures are proposed.

4.17.2.4 Alternative 4: Modified Site Layout

Short-term and long-term effects during Phases I and II under Alternative 4 would be slightly less than those identified under Alternative 3. Both Alternative 3 and 4 have identical construction durations, and the difference between the total areas graded and developed is five acres less for Alternative 4 compared to Alternative 3. In addition, the proposed energy generation for both alternatives would be the same at 45 MW. The effect to energy and minerals for Alternative 4 would be the same as Alternative 3.

4.17.2.5 Alternative 5: Smaller Project

This alternative would reduce the output of the solar plant from 45 megawatts to 30 megawatts. It would also reduce the size of the developed area from 433 acres to 238 acres (Figure 2-5). The western portion of this alternative would develop 120 acres west of Santa Fe Fire Road. The eastern part of the development would develop 108 acres east of Santa Fe Fire Road, realign Zircon Road, but would not develop the area south of the relocated Zircon Road. e required.

Similar to Alternatives 3 and 4, Alternative 5 would require an amendment to the CDCA Plan to change the ROW designation to suitable for solar energy development. Rerouting Zircon Road south of its current location would permit its continued public use.

Effect EAM-1: Restrict access to or the availability of mineral or energy resources within the project area

Access to some prospected or production sites for mineral or energy resources could be inhibited during construction; operations and maintenance; or decommissioning of the project; however, due to the lack of known mineral resources at the site, no effect on mineral or energy resources would occur. In addition, the project would require energy and mineral resources for construction, operations and maintenance, and decommissioning. However, given the expected 30-year lifespan of this clean energy project, this would not be an adverse effect. Therefore, no mitigation measures are proposed.

Effect EAM-2: Development of the solar field may result in excessive energy use

The project would require energy and mineral resources for construction, operations and maintenance, and decommissioning. However, given the expected 30-year lifespan of this clean energy project, this would not be an adverse effect. Therefore, no mitigation measures are proposed.

4.17.3 Cumulative Effects

Impact Methodology

For the cumulative effects analysis, a CESA has been identified to address the cumulative effects for energy and minerals. Cumulative effects can result from individually minor but collectively significant actions taken over time. Major past, present, and reasonably anticipated future land uses and disturbances in the area have been identified in Section 3.18 and include energy generation, military uses, commercial and residential developments, and roadway improvements. Dispersed recreation (including special motorized vehicle events), as well as residential and commercial development, also occur in parts of the CESAs.

Geographic Extent

The CESA used to analyze cumulative effects for energy and minerals encompasses the entire CDCA. The project, along with other proposed energy projects in the CDCA, would limit future access to hard rock and salable minerals.

Past, Present, and Reasonably Foreseeable Projects and Changes

All of the projects listed in Table 3.18-1 are within the CESA for energy and minerals and have been determined to have an effect on energy and minerals.

Cumulative Impact Analysis

As discussed in Section 3.17.2, there are no oil or gas producers or seeps within five miles of the project, and the nearest oil and gas site is a plugged and abandoned dry hole located 7.3 miles from the site. The closest developed mineral resource is 2.1 miles from the site. No known oil and gas or mineral resources exist at the site; therefore, the alternatives would not contribute to an adverse cumulative effect on access to or the availability of mineral or energy resources. In contrast, it would contribute cumulatively to increased availability of solar energy resources.

The CESA for non-energy minerals focuses on lost opportunities to access resources throughout the CDCA. The other proposed federal and non-federal projects could potentially restrict access to economically developable resources. While it is unknown to what degree these other project sites contain these resources, it is possible that the action alternatives could contribute to an adverse cumulative effect to mineral resources.

The action alternatives, as well as the other federal and non-federal projects listed in Table 3.18-1, would use mineral and energy resources during construction, operation and maintenance, and decommissioning. Given the size of the project site as well as the sizes of these other projects and the fact that several are renewable energy projects, neither the action alternatives nor the other projects would contribute to a cumulative excessive use of mineral or

energy resources. Their use of energy resources would be balanced by the generation of solar energy for 30 years.

4.17.4 Residual Effects

No residual effects on energy and mineral resources would result from implementation of the action alternatives.

4.18 Other NEPA Requirements

4.18.1 Unavoidable Adverse Impacts and Irreversible and Irretrievable Commitments of Resources

CEQ regulations at 40 CFR, Part 1502.16, and the BLM NEPA Handbook (H-1790-1, Sec. 9.2.9) require a discussion of adverse impacts that would remain after all reasonable and effective mitigation is applied, as well as disclosure of irreversible and irretrievable commitments of resources if the project is implemented. A resource commitment is considered irreversible when direct and indirect effects from its use limit future use options. Irreversible commitments apply primarily to nonrenewable resources, such as cultural resources and also to those resources that are renewable only over long periods of time, such as soil productivity or forest health. A resource commitment is considered irretrievable when the use or consumption of the resource is neither renewable nor recoverable for future use. Irretrievable commitments apply to loss of production, harvest, or use of natural resources.

The following section describes irreversible and irretrievable commitments that would occur in the project area and may be affected by construction, maintenance and operation, and decommissioning activities. A summary of environmental effects for all alternatives is presented at the end of this section in Table 4.18-1.

4.18.1.1 Air Quality and Climate

With the implementation of mitigation measures, construction and decommissioning activities would result in unavoidable adverse impacts on air quality. These are identified in Section 4.1 as residual effects. There would be unavoidable adverse impacts to air quality from particulate matter and vehicle emissions. The project does not trigger federal conformity levels, and would not, therefore cause irreversible and irretrievable commitment of air resources.

Potential contributions from direct GHG emissions due to the project would be considered a long-term effect; however, a comparison of the projected GHG emissions to the existing inventories and projections for California indicates that the project would not hinder attainment of the state's goals of reducing GHG emissions to 1990 levels by 2020.

Although the project would not be developed within a forested area, desert soils have a carbon storage capacity that would be lost due to construction of the project. Considering the relative proportion between the project area (516 acres) and the total regional extension of the CDCA (approximately 300,000 acres), potential effects of the project over the existing carbon storage capacity would be negligible; however, it would nonetheless be an unavoidable adverse impact.

4.18.1.2 Noise

Construction activities would cause increased noise levels, including vibration. This would be a localized and temporary effect and would cease at the end of construction. However, it is expected that low-level noise from transformers and vehicle use related to maintenance and operation activities would add a long-term unavoidable impact on composite noise conditions. Under certain atmospheric conditions, local residential receptors would notice this noise; however, the noise levels are not expected to exceed levels established by local noise ordinances.

4.18.1.3 Geology, Topography, and Geologic Hazards

There would be no unavoidable adverse impacts or irreversible and irretrievable commitments of geologic or topographic resources.

4.18.1.4 Soils

As discussed in Section 4.4, it is expected that the project would cause elevated levels of dust emissions and loss of topsoils, especially during construction and maintenance activities. Mitigation measures and BMPs, such as the stockpiling of topsoil during ground-disturbing activities for later revegetation efforts, would reduce the severity and occurrence of these effects; however, there would be an irreversible and irretrievable commitment of soil resources on areas where revegetation fails and subsequent erosion occurs.

Soil effects could also occur from petroleum and other hazardous material spills. Should a spill occur, the affected area would be cleaned up according to the approved SPCC Plan. Affected soils would be irretrievably and irreversibly lost, which would be an unavoidable adverse impact.

4.18.1.5 Water Resources/Hydrology

For the purposes of this analysis, an irreversible and irretrievable commitment of water resources would be the permanent contamination of surface water bodies or a groundwater aquifer, the overuse of these resources by the project to the point where they would not be available for other uses, or change in runoff patterns that would increase erosion, sediment flow, or the risk of flooding.

The project would use surface water or groundwater and would instead use off-site and permitted municipal or industrial water sources for dust control and panel cleaning. Therefore, the project would not cause an irreversible or irretrievable commitment of water resources in the project area.

Given the Applicant's proposed mitigation measures and BMPs, it is not expected that the project would cause unavoidable adverse impacts on water resources.

4.18.1.6 Biological Resources

Loss of up to 513 acres of native vegetation and five acres of disturbed habitat on the site of the project would result in an unavoidable adverse impact; however, with the implementation of mitigation measures and BMPs, effects on native vegetation would be negligible and would not substantially alter or interfere with wildlife or plant populations in the project area. Because the effects would be negligible and would affect only a localized region, the loss of native vegetation would not cause an irreversible and irretrievable commitment of the resource.

Of the 12 special status plants with potential to occur within the site of the project, none were found on-site during surveys, and only two have a moderate chance of occurring in the project area and being adversely affected by the project. Should these species be present on the site, the Applicant would attempt to avoid them through modified project design. If they could not be avoided, there would be an unavoidable adverse impact; however, the effect would be moderate and localized and would therefore not result in an irreversible and irretrievable commitment of the resource.

Localized and long-term unavoidable adverse impacts on wildlife, including special status species would occur. These effects, however, would not result in an irreversible and irretrievable commitment of the resource.

4.18.1.7 Cultural Resources

Construction of the project could involve ground disturbance at various locations along the area of potential effect, potentially resulting in disturbance or destruction of subsurface cultural resources. The project area, however, does not contain any sites recommended for inclusion on the National Register of Historical Places; therefore, no irreversible or irretrievable commitment of the cultural resources is expected.

4.18.1.8 Paleontological Resources

The geology of the project site has low potential for paleontological resources. The project is not expected to cause an irreversible and irretrievable commitment of the resource.

4.18.1.9 Land Use

Section 4.9 discusses the project's potential effect on an adjacent utility corridor and determined that the project would not prohibit future use of the corridor for utilities. The footprint of the project would limit future use of 518 acres of land for other uses for the life of the project and would irreversibly and irretrievably commit the resource.

4.18.1.10 Special Management Areas/Special Designations

The closest SMA is the Carbonate Endemic Plants ACEC, located 1.8 miles south of the project. Construction, operation and maintenance, and decommissioning would not have an unavoidable adverse impact on the ACEC. No other SMAs or lands with special designations are directly or indirectly affected by the project, and no irretrievable and irreversible commitment of resources would occur.

4.18.1.11 Recreation

Construction of the project would cause unavoidable adverse impacts on recreation resources by temporarily disrupting access via the Santa Fe Fire Road to the closest recreation areas located in the adjacent San Bernardino National Forest. The effect would be temporary and would not result in irreversible or irretrievable commitments of recreational resources.

4.18.1.12 Visual Resources

Construction of the project would cause unavoidable short-term and long-term adverse impacts on visual resources by disrupting the view shed in the project area; however, the area is not in a designated area of natural beauty, so the effects during construction and decommissioning would be moderate, and effects during operations would be minor. If the site were decommissioned and revegetated at some point in the future, the effects would not result in an irretrievable and irreversible commitment of resources.

4.18.1.13 Transportation and Traffic

Construction of the project would cause localized, temporary, and unavoidable adverse impacts on roads and traffic. Traffic would be stopped at times or rerouted during construction of the 33-kV transmission line across Foothill Road, which is expected to last for one day. Vehicular use by construction workers would cause a minor increase in traffic on access routes to the job site during Phase I and II, affecting primarily Foothill Road and Santa Fe Fire Road. This increase would not affect the level-of-service for these roads.

During both phases, oversized loads could cause short-term, temporary transportation disruptions and may require wider turning clearance requirements. Effects on the transportation network and effects on traffic would occur only during construction, and occasionally during maintenance activities. The project would not cause a change in the level of service for the affected roads and would not cause a permanent irreversible and irretrievable commitment of the resource.

4.18.1.14 Social and Economic Conditions

The project would create up to 45 jobs during construction and up to three permanent jobs for life of the project. Occasional maintenance and repair activities could temporarily increase the number of on site staff. This workforce would have a beneficial economic effect on the local economy. The project would increase local revenues, which would be a beneficial effect. The analysis in Section 4.14 indicates that no irreversible and irretrievable commitments of the economic resources would occur. The analysis also indicates that social conditions would not be adversely affected by the project.

4.18.1.15 Public Safety/Hazardous Materials

Construction, operations and maintenance, and decommissioning of the project could create public health and safety effects, especially on workers. In addition, the project could introduce hazardous materials into the environment, mostly in the form of fuel, lubricants, and solvents used in construction and operation of the facilities. Several mitigation measures have been identified to reduce potential effects below federal and state safety limits. Therefore, the project would cause an irreversible and irretrievable commitment of the resource or unavoidable adverse public health and safety impacts.

4.18.1.16 Environmental Justice

As discussed in Section 4.16, the project and its associated transmission lines are located within a rural development utility corridor and along existing roads. The project is not located in or near an urban area and would not disproportionately affect low income or minority populations; therefore, no unavoidable adverse impacts or irreversible and irretrievable commitments of resources are expected.

4.18.1.17 Energy and Minerals

The project is located in an area with little or no mining activity, and no energy minerals are found on the site. Therefore, no unavoidable adverse impacts or irreversible and irreversible commitments of energy and mineral resources are expected.

4.18.2 Relationship Between Short-Term Uses and Long-Term Productivity of the Environment

NEPA requires consideration of the relationship between short-term uses of the environment and long-term productivity associated with the project. This involves the consideration of whether the project would sacrifice a resource value that might benefit the environment in the long-term for some short-term value to the Applicant or the public. For purposes of this discussion, short-term refers to three years or less after the construction phase ends and subsequent restoration and rehabilitation activities. Long-term refers to three years or longer.

Short-term use of the environment during construction and restoration would result in the temporary loss of some resources, such as temporary loss of some habitat and access to recreational facilities, increased noise, and air quality effects. Approximately 518 acres of land would be permanently lost within the project area, and some flora and fauna specimens in the area in and around the construction and infrastructure locations would be lost. Longer term effects include the permanent loss of some visual quality from the introduction of the solar arrays and associated infrastructure, access roads in previously undisturbed areas, and landscape scarring.

While there would be some irreversible and irretrievable commitments of some resources, as noted above, there would be no permanent loss of the overall productivity of the environment from the project.

Table 4.18-1 Comparison Summary of Effects of Alternatives

Resource Area	Alternative 1 (No Action)	Alternative 2 (Land Use Plan Amendment)	Alternative 3 (CES Proposed Action)	Alternative 4 (Modified Site Layout)	Alternative 5 Smaller Project Alternative
4.1 Air Quality	No effects	No effects	<p>During construction, total annual emissions of PM10, if both phases occur in the same year, would be above the CCAA threshold of 15 tons per year with a value of 16.82 tons per year.</p> <p>During reclamation there would be potential short-term increase in air pollutant emissions.</p> <p>During construction, routine operational activities, maintenance, and decommissioning, GHG emissions would be generated. A comparison of the GHG emissions (88.3 MtCO₂e) to the existing power plant inventory for California (107,243,302 MtCO₂e) shows that the emissions resulting from the Proposed Action would be 0.00008 percent. A typical 45-MW fossil fuel fired power plant in California would produce 1,448,330 metric tons of carbon dioxide equivalents (MtCO₂e) over its 30 year lifespan. Subtracting the Proposed Action GHG emissions (88.3 MtCO₂e) from these avoided emissions also indicates that the Proposed Action would assist in the attainment of the state's goals of reducing GHG emissions to 1990 levels by 2020. This would result in a loss of 317.5 tons of carbon storage capacity.</p>	<p>Effects during Phases I and II under this alternative would be the same as those identified under Alternative 3 since the project is the same size and the same amounts and types of disturbance would occur using the same vehicles for the same length of time.</p>	<p>During construction, total annual emissions of PM10, if both phases occur in the same year, would be above the CCAA threshold of 15 tons per year with a value of 15.51 tons per year.</p> <p>During construction, routine operational activities, maintenance, and decommissioning, GHG emissions would be generated. A comparison of Alternative 5 GHG emissions (51.5 MtCO₂e) to the existing power plant inventory for California (107,243,302 MtCO₂e), not including construction) shows that emissions resulting from Alternative 5 would be are 0.00005 percent. A typical 30-MW fossil fuel fired power in California would produce 965,553 MtCO₂e over its 30 year lifespan. Subtracting the alternative project GHG emissions (51.5 MtCO₂e) from these avoided emissions also indicates that Alternative 5 would assist in the attainment of the state's goals of reducing GHG emissions to 1990 levels by 2020. This would result in a loss of 254 tons of carbon storage capacity.</p>
4.2 Noise	No effects	No effects	<p>Individual pieces of equipment would generate noise levels in a range from 74 to 89 dBA at 50 feet from the source (Table 4.2-1).</p>	<p>Effects under this alternative would be slightly reduced. Since Alternative 3 is the same size and the same</p>	<p>Effects under this alternative would be short-term, adverse construction noise, ground-borne vibration, and traffic noise similar to the effects under Alternative 3. However, since</p>

Table 4.18-1 Comparison Summary of Effects of Alternatives

Resource Area	Alternative 1 (No Action)	Alternative 2 (Land Use Plan Amendment)	Alternative 3 (CES Proposed Action)	Alternative 4 (Modified Site Layout)	Alternative 5 Smaller Project Alternative
			<p>Due to the location of the closest residence (located less than 0.1 mile from the site), these noise and vibration levels would not be attenuated over distance and reduced to background levels at the closest sensitive receptor (located less than 0.1 mile from the site). Because construction of Phase I would begin in the north and move to the south, disturbance from Phase I construction would result in a short-term, adverse effect to the residence.</p> <p>During construction, the Phase I equipment would include a total of 10 transformers (one for every two megawatts of power generation) to be enclosed within each photovoltaic power block. However, the closest transformer to the closest receptor is over 500 feet away. Even with the composite noise of 10 transformers in Phase I, the sound level at the closest receptor would not exceed 55 dB. While this would result in a long-term increase in ambient noise levels, it would not be audible to the nearest receptor.</p>	<p>amounts and types of disturbance would occur, the same amount of noise would be generated, however, since the project would be moved 50 feet further away from the closest sensitive receptor and have a vegetative screen installed, noise effects would be attenuated slightly.</p>	<p>the construction periods for these phases are shorter under this alternative, effects would be for a shorter time period.</p>

Table 4.18-1 Comparison Summary of Effects of Alternatives

Resource Area	Alternative 1 (No Action)	Alternative 2 (Land Use Plan Amendment)	Alternative 3 (CES Proposed Action)	Alternative 4 (Modified Site Layout)	Alternative 5 Smaller Project Alternative
4.3 Geology, Topography, & Geologic Hazards	No effects	No effects	<p>The Proposed Action would not increase the geologic instability of the area and would not increase the risk of on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse. There would be no effect on a unique geologic feature.</p> <p>Flash flood events could result in on-site damage that could represent a hazard. It is possible that a major flash flood could result in damage down gradient of the site.</p> <p>Compliance with earthquake building codes and maintaining the natural drainage would minimize potential risk associated with the most likely geologic hazards; however, once these events occur, they can strain or stress the existing infrastructure.</p>	Effects under this alternative would be the same as those identified under Alternative 3 since the project is the same size and the same amounts and types of disturbance would occur.	Effects under this alternative would be the similar as those identified under Alternative 3. The difference in the area graded (10 acres) and developed (238 acres) would be reduced, but the type, intensity, and duration of the effects would be similar.
4.4 Soils	No effects	No effects	<p>Both topsoil and vegetation would be removed and vegetation would not be allowed to re-grow over an approximate 12.5 acre area. Therefore, there would a strong potential for wind and water erosion over this 12.5 acres. Another 420 acres would be grubbed or scarified for solar panel installation.</p> <p>The Proposed Action would increase the erodibility of the soils through grubbing and scarifying to remove vegetation across 420 acres of the project area.</p> <p>Due to the lack of protected soils at the</p>	Effects under this alternative would be the same as those identified under Alternative 3 since the project is the same size and the same amounts and types of disturbance would occur.	Effects would be the similar, but less than those identified for Alternative 3. Only 10 acres would be graded as opposed to 12.5 acres; therefore, fewer acres of topsoil would be removed. Since the alternative would decrease the number of structures, specifically concrete pads and post, and the area over which erosion would occur and topsoil removed would be less than Alternative 3, then the effects from this alternative would be similar but less than those for Alternative 3.

Table 4.18-1 Comparison Summary of Effects of Alternatives

Resource Area	Alternative 1 (No Action)	Alternative 2 (Land Use Plan Amendment)	Alternative 3 (CES Proposed Action)	Alternative 4 (Modified Site Layout)	Alternative 5 Smaller Project Alternative
			site, development of the Proposed Action would not affect soils identified for special protection.		
4.5 Water Resources	No effects	No effects	<p>The Applicant is conducting flooding models using the Hydrologic Engineering Centers River Analysis System [HEC-RAS] of the USACE; however, the data were not available at the time of publication of this document. Previous modeling by the Applicant has indicated the major drainage channels could experience high flows during episodic rain events. The available information suggests that flooding is possible in the project area, but the intensity and frequency of these events is not known. Therefore, it is not possible at this time to estimate what the potential flood risk is at the site and the possible effects.</p> <p>The flow pattern alteration would not alter the overall flow pattern for the area.</p> <p>Groundwater quality would not be altered by the Proposed Action.</p> <p>The Proposed Action would degrade the quality of surface waters by increasing erosion, increasing sedimentation, or introducing contaminated waters.</p> <p>The water obtained for both construction and operations would be from a permitted off-site source; therefore, it would not decrease the water supply in the project area.</p>	Effects under this alternative would be the same as those identified under Alternative 3 since the project is the same size and the same amounts and types of disturbance would occur and the same amount of water would be used.	<p>Effects would be similar to those identified for Alternative 3. However, because only 238 acres would be developed and solar arrays would be located on approximately 228 acres, this alternative would slightly reduce the area graded to approximately 10 acres and decrease the area where infiltration would not occur. The reduced footprint would also reduce the area where potential drainage could be altered.</p> <p>This alternative would also require less water for panel washing than under Alternative 3.</p>

Table 4.18-1 Comparison Summary of Effects of Alternatives

Resource Area	Alternative 1 (No Action)	Alternative 2 (Land Use Plan Amendment)	Alternative 3 (CES Proposed Action)	Alternative 4 (Modified Site Layout)	Alternative 5 Smaller Project Alternative
4.6 Biological Resources	No effect	No effect	<p>Direct effects to yucca plants during construction would be significant. Grading and grubbing activities would cause the direct loss of approximately 420 acres of creosote bush-white bursage, white bursage, desert wash, and/or already disturbed vegetative communities.</p> <p>The long-term effects to vegetation would depend on the scale, intensity, and duration of the activity.</p> <p>Grading and grubbing activities could create opportunities for non-native invasive weed species to colonize in areas where they had not previously occurred.</p> <p>Construction could directly affect wildlife by loss and fragmentation of cover, breeding, and foraging habitat. These activities and vehicle use could cause direct mortality to wildlife.</p> <p>Human activity would likely cause most wildlife species to avoid the project area until the disturbance conditions have concluded. Transmission poles could also pose a direct collision hazard to birds. Human activities could potentially provide food or other attractants which could draw unnaturally high numbers of opportunistic predators and scavengers.</p> <p>Loss of burrows due to construction could also cause wildlife to search for or dig new</p>	<p>Effects would be similar to those described for Alternative 3.</p> <p>Alternative 4 would involve the same initial effect on native communities; however, the corridor along Santa Fe Fire Road would provide an opportunity for some native vegetation to be salvaged from the construction site and transplanted.</p> <p>Similarly, Alternative 4 would involve the same initial effect on native plant species except Joshua trees could be replanted along the corridor. Invasive species could likely be increased, as with Alternative 3, due to mechanically disturbed soil and habitat. Although Alternative 4 would provide increased habitat for wildlife, water and foraging opportunities could draw wildlife into an area of greater traffic and risk for mortality.</p> <p>Alternative 4 would have similar effects on special</p>	<p>Under Alternative 5, construction and operations and maintenance activities would cause similar direct and indirect effects as described under Alternative 3. However, this alternative would reduce the area of disturbance and, therefore, reduce the amount of vegetation that would be removed compared to Alternative 3.</p> <p>Only 238 acres would be developed with solar arrays. This alternative would reduce the loss of wildlife habitat. This alternative would reduce the potential effects to special status species compared to Alternative 3.</p>

Table 4.18-1 Comparison Summary of Effects of Alternatives

Resource Area	Alternative 1 (No Action)	Alternative 2 (Land Use Plan Amendment)	Alternative 3 (CES Proposed Action)	Alternative 4 (Modified Site Layout)	Alternative 5 Smaller Project Alternative
			<p>burrows. Infrastructure development could alter wildlife movement in the area and just outside the boundary of the project. Fences and transmission poles could also cause increased predation on wildlife because raptors could use the infrastructure for perches. Loss of vegetation could indirectly reduce available forage and shelter, degrading and fragmenting existing higher quality habitat.</p> <p>The introduction of an artificial water source into the project area may provide suitable habitat for the Argentine ant, an invasive species in California.</p> <p>Clearing and grading activities would directly remove special status plants from the area. Construction activities, ongoing maintenance, including vegetation clearing, and the frequent use of vehicles on-site could introduce invasive weeds to the site. Le Conte's thrasher, northern harrier, and prairie falcon have been observed on the site and may be adversely affected by the Proposed Action. If burrowing owls are present on the site during construction, they may not be able to move quickly enough to avoid mortality due to collisions with vehicles and equipment. Vehicle use on the site during operation and maintenance could also increase collisions and mortality of the burrowing owl.</p>	<p>status species as those described for Alternative 3. Although Alternative 4 could provide increased habitat for wildlife, water and foraging opportunities could draw wildlife into an area of greater traffic and risk for mortality. This would be particularly relevant for desert tortoise, nesting and foraging birds, and foraging raptors.</p>	

Table 4.18-1 Comparison Summary of Effects of Alternatives

Resource Area	Alternative 1 (No Action)	Alternative 2 (Land Use Plan Amendment)	Alternative 3 (CES Proposed Action)	Alternative 4 (Modified Site Layout)	Alternative 5 Smaller Project Alternative
			Desert tortoise are present on-site and could be adversely affected by the Proposed Action. Effects would be both short- and long-term. The Proposed Action could result in direct or indirect effects on birds protected by the Migratory Bird Treaty Act, including northern harrier, prairie falcon, golden eagle, red-tailed hawk, and any other migratory bird species.		
4.7 Cultural Resources	No effects	No effects	No cultural resources eligible for inclusion in the NRHP are known to occur in the project area.	Effects under this alternative would be the same as those identified under Alternative 3.	Effects to cultural resources resulting from this alternative would be similar to those identified under Alternative 3.
4.8 Paleontological Resources	No effects	No effects	The Proposed Action has a low potential to affect significant nonrenewable fossil resources.	Effects under this alternative would be the same as those identified under Alternative 3.	Effects to paleontological resources resulting from this alternative would be similar to those identified under Alternative 3.
4.9 Land Use and Realty	No effects	No effects	The Proposed Action would, have no adverse effect on the BLM's ability to site future utilities within the corridor and would not conflict with either the Energy Production and Utility Corridor Element or the MUC M designation of the CDCA Plan.	Effects under this alternative would be the same as those identified under Alternative 3.	Effects under this alternative would be the same as those identified under Alternative 3.

Table 4.18-1 Comparison Summary of Effects of Alternatives

Resource Area	Alternative 1 (No Action)	Alternative 2 (Land Use Plan Amendment)	Alternative 3 (CES Proposed Action)	Alternative 4 (Modified Site Layout)	Alternative 5 Smaller Project Alternative
4.10 Special Management Areas	No effects	No effects	No effect to Special Management Areas (SMAs) as a result of the Proposed Action. State Route 247 is a County-designated Scenic Route. Drivers along State Route 247 would have short-term views of the project site during construction, operations and maintenance, and reclamation. Impacts to sensitive viewers are evaluated in more detail in Section 4.6.	Effects under this alternative would be the same as those identified under Alternative 3.	Effects under this alternative would be the same as those associated with the Proposed Action (Alternative 3).
4.11 Recreation	No effects	No effects	Construction of the Proposed Action would affect off-site recreational uses through short term disruption of access from fugitive dust from clearing and grading and long term alteration of the views as seen from recreation areas; however, visual effects are discussed in greater detail in Section 4.12. The temporary closure of portions of Santa Fe Fire Road during grading and hardening would result in short-term effects on access but long-term beneficial effects on the quality of the road.	Effects under this alternative would be the same as those identified under Alternative 3.	The effects to recreation would be the same under this alternative from construction, operations and maintenance, and decommissioning as those identified in Alternative 3.
4.12 Visual Resources	No effects	No effects	During the construction period, construction activities and materials, equipment, trucks, and parked vehicles all could be visible on the proposed project site and thus temporarily change the existing visual environment. Construction activities would be conducted in a manner that would minimize (visible) dust emissions. Therefore, visual changes associated with construction period activities at the proposed project site would be short-term.	Under this alternative, recreationists traveling the Santa Fe Fire Road en route to Blackhawk Canyon would see shielded views of the proposed project which would reduce the visual effect of the project. All other viewpoints would have the same views as Alternative 3 and the	Visual effects during construction of Phase I and II would be similar to effects under Alternative 3. However, since the construction periods for these phases are shorter under this alternative, effects would be for a shorter time period. Since a smaller amount of area is being developed and the amount of energy being produced is less, the facility itself would be smaller and be less of a contrast to the surrounding area.

Table 4.18-1 Comparison Summary of Effects of Alternatives

Resource Area	Alternative 1 (No Action)	Alternative 2 (Land Use Plan Amendment)	Alternative 3 (CES Proposed Action)	Alternative 4 (Modified Site Layout)	Alternative 5 Smaller Project Alternative
			The proposed project would result in increased levels of visual contrast by introducing new permanent above-ground structures into the landscape. However, these changes would not directly conflict with the management objectives associated with the interim VRM class established for the proposed project site. In summary, visual changes associated with operations and maintenance would be long-term.	effects on visual resources would be the same during Phases I and II.	Visual changes associated with operations and maintenance would be long-term, however, they would be less than that experienced under Alternative 3.
4.13 Transportation	No effects	No effects	Construction of both phases of the project would result in short-term increases in traffic volume of a maximum of 90 trips per day (45 morning and 45 evening trips) due to the construction labor force (assuming they all drive separately) and an additional unquantified short-term increase in traffic volume. Up to a maximum of 90 additional trips per day would not change the LOS of SR 247, nor would it affect the LOS of I 15, SR 18, or Bear Valley Road. During Phase II the labor force would mirror the labor force discussed for Phase I.	Effects under this alternative would be the same as those identified under Alternative 3.	Implementation of this alternative would result in similar effects to traffic volume as Alternative 3. The number of trips from workers and construction equipment as well as the delivery of supplies at the peak of construction would be the same as under Alternative 3; however, the effect would be for a shorter period since the construction phases under this alternative are shorter than the construction phases under Alternative 3. The effects to Foothill Road, Santa Fe Fire Road, and Zircon Road would be the same. There would be short-term traffic disruptions due to oversize loads. However, since this alternative is smaller than Alternative 3, this disruption would be for a shorter period of time.

Table 4.18-1 Comparison Summary of Effects of Alternatives

Resource Area	Alternative 1 (No Action)	Alternative 2 (Land Use Plan Amendment)	Alternative 3 (CES Proposed Action)	Alternative 4 (Modified Site Layout)	Alternative 5 Smaller Project Alternative
4.14 Human Health and Safety/Hazardous Materials	No effects	No effects	It is unlikely that a hazard to the public or environment would occur as a result of soil disturbance at the site during construction of the Proposed Action. Disturbance of groundwater is also not expected to occur during site construction because foundations would not be drilled to these depths. Leaks would likely be contained within the walls of the substation and the transformers would have biodegradable oil. The solar facility may increase the potential for additional incidents related to fire and fire safety.	The effects and related mitigation measures would be the same for this alternative as those for Alternative 3.	Because the footprint is smaller and the construction period shorter for this alternative, the likelihood of potential small spills would be reduced proportionately; however, the types of effects and related mitigation measures would be the same for this alternative as those for Alternative 3.
4.15 Social and Economic Conditions	No effects	No effects	Assuming that \$20 million of construction phase direct spending (related to wages and purchases of materials and equipment) occurs in San Bernardino County, the initial \$20 million in direct local content expenditures would generate a grand total of \$36.1 million in total output to the region. In addition, the cumulative lifetime annual fee for BLM rents would be \$5.6 million. Indirect effects include the effects occurring along the supporting supply chain as goods and services are purchased from vendors and subcontractors supporting the installation. Induced effects represent the cumulative effects from household spending, reflecting labor earnings from direct and indirect related economic activity. On average, 25 construction and supervisory personnel would be required on-site for approximately eight months to build Phase I, with 45 personnel being required at peak times. During Phase II, this	Effects during Phases I and II under this alternative would be similar to Alternative 3.	Effects during Phases I and II under this alternative would be similar to Alternative 3

Table 4.18-1 Comparison Summary of Effects of Alternatives

Resource Area	Alternative 1 (No Action)	Alternative 2 (Land Use Plan Amendment)	Alternative 3 (CES Proposed Action)	Alternative 4 (Modified Site Layout)	Alternative 5 Smaller Project Alternative
			manpower loading would be repeated.		
4.16 Environmental Justice	No effects	No effects	The Proposed Action is not expected to have a disproportionately high and adverse human health or environmental effect on minority and low-income populations in the Lucerne Valley.	Effects under this alternative would be similar to Alternative 3.	Effects under this alternative would be similar to Alternative 3
4.17 Energy and Minerals	No effects	No effects	No effect on mineral or energy resources would occur. The Proposed Action would require energy and mineral resources for construction, operations and maintenance, and decommissioning. However, given the expected 30-year lifespan of this renewable energy project, this would not be an adverse effect.	Effects under this alternative would be similar to Alternative 3	Effects under this alternative would be similar to Alternative 3.