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CHAPTER 4
Environmental Consequences

4.1 Introduction

This chapter assesses environmental consequences or impacts that would result from the implementation of the Proposed Action or the alternatives described in Chapter 2, *Proposed Action and Alternatives*. The scope of the impact analyses presented in this chapter is commensurate with the level of detail for the alternatives provided in Chapter 2, and the availability and/or quality of data necessary to assess impacts. Baseline conditions for assessing the potential environmental impacts are described in Chapter 3, *Affected Environment*.

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

4.1.1 Baseline

The baseline for purposes of this PA/FEIS is the affected environment described in Sections 3.2 through 3.22, which generally reflect conditions as they existed on or about August 29, 2011, when the BLM published a NOI announcing its intention to prepare a Draft PA/EIS. The baseline is intended to reflect the pre-Project environmental conditions to which the potential impacts of the Proposed Action and alternatives are compared in Sections 4.2 through 4.24.

4.1.2 Analytical Assumptions

The impacts analyses contained within this chapter were conducted using the following assumptions:

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

2. The proposed facility would be constructed, operated, maintained, and decommissioned as described in each action alternative including the implementation of APMs (see Section 2.3.1.4.

3. Short-term impacts are those expected to occur during the construction phase and the first 5 years of the operation and maintenance phase. Long-term impacts are those that would occur after the first 5 years of operation.

4.1.3 Types of Effects

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

4.1.4 Resources and Uses Not Affected or Present in the Action Area

The resources, BLM program areas, or other aspects of the human environment that were determined by the BLM as not affected or not present in the Project area include: wild and scenic rivers; national scenic or historic trails, monuments, recreation areas, or conservation areas; cooperative management and protection areas; outstanding natural areas; forest reserves; wetlands; livestock grazing; and wild horses and burros.

4.1.5 Cumulative Scenario Approach

Cumulative effects are defined as the impact on the environmental that results from the incremental impact of the Proposed Action and alternatives when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions (40 CFR 1508.7). This PA/FEIS analyzes the cumulative effects of the construction, operation and maintenance, closure, and decommissioning of the Project within the ROW grant application area and all other elements of the Proposed Action, taking into account the effects of other past, present, and reasonably foreseeable future actions. The cumulative effects analysis considers past actions that are related either in time or space (i.e., temporally or in geographic proximity) to the proposed action, present actions that are ongoing at the same time the Draft PA/EIS was being prepared; and reasonably foreseeable future actions, limited to those for which there are existing decisions, funding, formal proposals, or which are highly probable, based on known opportunities or trends.

Varying degrees of information exist about projects within the cumulative scenario. Therefore, for resource areas for which quantitative information is available, a quantitative analysis is provided; however, if said level of detail is not available, a qualitative analysis is provided. Because cumulative effects is defined as the incremental impact of a Proposed Action and alternatives, the PA/FEIS does not analyze potential cumulative effects on a resource if the Proposed Action and alternatives would have no direct or indirect effects on that resource. See, for example, Section 4.1.4, *Resources and Uses Not Affected or Present in the Action Area*.

The cumulative scenario includes projects identified in Table 4.1-1. Table 4.1-1 identifies each resource or BLM program, the cumulative analysis impacts area (which is the geographic scope for each cumulative effects issue), issues to consider (as limited by the timeframes within which the Project could cause an effect), and which renewable projects, other known actions or activities

TABLE 4.1-1
CUMULATIVE SCENARIO

Resource or BLM Program	Cumulative Analysis Impact Area	Issues to Consider	BLM Renewable Energy Projects	Other Known Actions/Activities
Air Resources	MDAB	PM2.5, PM10, ozone	All projects	All projects
Biological Resources - Wildlife	Recovery Plan Area defined by NECO; Critical Habitat Unit defined by USFWS/CDFG; existing range or eastern Riverside County	Desert Tortoise, Mojave fringe-toed lizard, Couch's spadefoot toad, migratory birds, golden eagle, western burrowing owl, American badger, kit fox, Nelson's big horn sheep. Also, mortality and injury; special status wildlife; wildlife movement; indirect impacts, including from lighting, collisions, and climate change.	All projects	All California projects
Biological Resources – Vegetation	NECO Plan area	Ephemeral drainages and natural communities; special status plants; stabilized and partially stabilized dunes and sand transport corridors; invasive plants	All projects	All California projects
Cultural Resources	Cultural sites, traditional use areas, and cultural landscapes on the plant site, along the linear facilities corridor and in the general vicinity of the site, including along the I-10 corridor	Ground-disturbing activities and the cultural character of the site and its vicinity. Cultural resources, including archaeological (prehistoric and historic), and ethnographic resources.	All projects	All projects
Geology and Soils	Project site and linear facilities corridor Watershed, PVMGB	Accelerated and/or environmentally harmful soil erosion; and land subsidence.	Blythe Energy Project II, BSPP, Desert Quartzite Solar Farm, Gypsum Solar, enXco McCoy	Palo Verde Mesa Solar Project, Blythe Airport Solar I Project, Blythe PV Project
Greenhouse Gases and Climate Change	International, national, and regional	CO2e	All projects	All projects
Hazards and Hazardous Materials	MDAB, watershed, groundwater basin, with focus on and in the vicinity of the site Project site and linear facilities corridor; jurisdictional boundary of the RCFD plus mutual aid agencies	Releases, spills, emissions, bacteria; ground disturbance that exposes existing subsurface conditions; engineering and administrative controls; health risks Site access; fire response; hazardous materials response; advanced life support/paramedic services; disaster preparedness	All projects	All projects
Lands and Realty	Project site and linear facilities corridor; CDCA Plan areas bearing the multiple use class designation "Limited"	Designated utility corridors (e.g., transmission lines, cellular telephone towers, poles), existing ROWs, I-10; restriction or preclusion of otherwise allowable use opportunities	BSPP, enXco McCoy, Desert Quartzite, Palo Verde 2, and Rio Mesa	Desert Southwest Transmission Line Project; Eagle Mountain Landfill Project
Mineral Resources	All areas potentially underlain by construction-grade aggregate resources	Designated aggregate resource areas, extent and availability of aggregate.	All projects	All projects

TABLE 4.1-1 (Continued)
CUMULATIVE SCENARIO

Resource or BLM Program	Cumulative Analysis Impact Area	Elements to Consider	BLM Renewable Energy Projects	Other Known Actions/Activities
Noise	Areas within 0.5 mile of the Project	Equipment, motor vehicles	enXco McCoy, BSPP, and Palo Verde 2	Colorado River Substation Expansion and CUP03602
Paleontological Resources	Quaternary-age geologic units within Eastern Riverside County	Ground-disturbing activities; rock units with potential high sensitivity or known paleontological resources	All projects	All projects with ground disturbance
Recreation and Public Access	NECO Plan area “Class L” lands, LTVAs, Lands with Wilderness Characteristics, OHV Routes, recreational areas within viewing or hearing distance	Dispersed recreational opportunities and experiences, LTVAs, lands with wilderness characteristics OHV, recreation opportunities, unauthorized routes	enXco McCoy, BSPP, Palo Verde 2, Rio Mesa Solar Electric Generating Facility, Desert Quartzite	Desert Southwest Transmission Line Project, Eagle Mountain Landfill Project, Blythe Airport Solar Project, Colorado River Substation Expansion, and CUP03602
Social and Economic Setting	Social: Eastern Riverside County Economic: Riverside County	Flow of goods and services; impacts to local infrastructure and services; ability to meet housing demand; employment/labor demand; possible positive impacts to regional economic sectors and/or adverse community impacts; severance or other tax benefits; ability of communities to absorb impacts.	Palen Solar Energy Project, enXco McCoy, Genesis Solar Energy Project, Chuckwalla Solar I, Rice Solar Energy Project, Blythe Solar Power Project, Desert Quartzite, Desert Sunlight, Desert Harvest Project, Gypsum Solar, Palo Verde 2, Desert Center II, Rio Mesa Solar Electric Generating Facility	Devers-Palo Verde 2 Transmission Line Project, Colorado River Substation Expansion, Desert Southwest Transmission Line, BNR100126, CUP03602, Palo Verde Mesa Solar Project
Special Designations	California Desert, with emphasis on Riverside County	Lands with Wilderness Characteristics	enXco McCoy	None
Transportation and Traffic	Transportation: Eastern Riverside County, focusing on the I-10 corridor	Construction traffic – materials and workers	All projects	All projects listed in Table 4.1-4
Utilities and Service Systems	California Desert, with emphasis on Riverside County	Solid and liquid wastes	All projects	All projects
Visual Resources	I-10 corridor; viewshed and visible area described in Section 3.22.1.3	Project appearance/visual contrast; construction-related dust, light, glint and glare; views from key observation points	BSPP, Desert Quartzite, and Palo Verde 2	Blythe Airport Solar Project, Colorado River Substation Expansion, and CUP03602
Surface water	Watershed	Hydrology and water quality	enXco McCoy, BSPP, Desert Quartzsite, Gypsum Solar, Palo Verde 2, Rio Mesa	Blythe Energy Project Transmission Line, Blythe PV Project, City of Blythe projects, Blythe Airport Solar I Project, DPV2, CRS, Desert Southwest Transmission Line, Eagle Mountain Landfill Project, RCL00161R1, BGR100258, BNR100126, CUP03602, Palo Verde Mesa Solar Project

TABLE 4.1-1 (Continued)
CUMULATIVE SCENARIO

Resource or BLM Program	Cumulative Analysis Impact Area	Elements to Consider	BLM Renewable Energy Projects	Other Known Actions/Activities
Groundwater	PVMGB	Basin balance, levels and quality	Blythe Energy Project II, BSPP, Desert Quartzite Solar Farm, Gypsum Solar, and enXco McCoy	Blythe PV Project
Wildland Fire Ecology	Eastern Riverside County	Mortality of plants and wildlife, loss of forage and cover; changes to the vegetation communities; spread of invasive plants; consequences of subsequent extreme weather events	All projects	West-wide Section 368 Energy Corridors, Eagle Mountain Pumping Plant, Recreational Opportunities, Kaiser Mine, Blythe Energy Project Transmission Line, Blythe Airport Solar 1, Chuckwalla Valley Raceway, Interstate 10, Chuckwalla Valley State Prison, Ironwood State Prison, Devers-Palo Verde 1 Transmission Line, Blythe Energy Project II, Devers-Palo Verde 2 Trans-mission Line Project, Colorado River Substation Expansion, Desert Southwest Transmission Line, Eagle Mountain Landfill Project
Transmission line safety and nuisance	Immediate vicinity of the proposed gen-tie line	Interference with radio-frequency communication; noise; fire hazards; hazardous shocks; nuisance shocks; and EMF exposure	All projects	Devers-Palo Verde 1 Transmission Line, Blythe Energy Project Transmission Line, Devers-Palo Verde 2 Transmission Line, and Desert Southwest Transmission Line
Aviation safety	Air space governed by the Blythe ALUCP	Navigable airspace; reflectivity and temporary flash occurrences; radio frequency emissions and potential interference; thermal plumes; height and location of structures; clear space within Compatibility Zone D; bird strike and avian-aviation incompatibilities	BSPP, enXco McCoy, Blythe Energy Project II	Blythe Airport Solar 1, Blythe PV Project, Blythe Energy Project Transmission Line, Devers-Palo Verde 1 Transmission Line, Desert Southwest Transmission Line, Palo Verde Mesa Solar Project

TABLE 4.1-2
RENEWABLE ENERGY PROJECTS IN THE CALIFORNIA DESERT DISTRICT

BLM Field Office	Number of Projects & Acres	Total MW
Solar Energy		
Bakersfield Field Office	1 project 1,503 acres	150 MW
Barstow Field Office	6 projects 26,850 acres	3,522 MW
El Centro Field Office	6 projects 25,083 acres	2,329 MW
Needles Field Office	3 projects 40,825 acres	920 MW
Palm Springs Field Office	10 projects 67,041 acres	4,768 MW
TOTAL – CA Desert District	***26 projects 161,302 acres***	***11,689 MW***
Wind Energy		
Alturas Field Office	2 projects 35,727 acres	n/a
Barstow Field Office	23 projects 180,591 acres	n/a
Eagle Lake Field Office	11 projects 166,078 acres	n/a
El Centro Field Office	15 projects 120,510 acres	n/a
Hollister Field Office	1 project 9,051 acres	n/a
Needles Field Office	6 projects 74,006 acres	n/a
Palm Springs Field Office	4 projects 7,694 acres	n/a
Ridgecrest Field Office	24 projects 203,571 acres	n/a
Surprise Field Office	4 projects 84,697 acres	n/a
Ukiah Field Office	4 projects 24,637 acres	n/a
TOTAL – CA Desert District	***94 projects 906,562 acres***	n/a

SOURCE: BLM, 2011a,b

are located or would occur within the cumulative analysis impacts area. Table 4.1-2 identifies the total acreage and, where available, power rating of renewable energy projects authorized or applied for on BLM Desert District lands. Most of the projects listed below have been, are being, or would be required to undergo their own independent environmental review under NEPA, CEQA, or both, as applicable. Tables 4.1-3 and 4.1-4 identify existing and reasonably foreseeable future projects along the I-10 corridor. These projects are shown in Figure 4.1-1.

TABLE 4.1-3
EXISTING PROJECTS ALONG THE I-10 CORRIDOR (Eastern Riverside County)

ID #	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
1	Interstate 10	Linear project running from Santa Monica to Blythe (in California)	Caltrans	Existing	N/A	I-10 is a major east-west route for trucks delivering goods to and from California. It is a four lane divided highway in the Blythe region.
2	Chuckawalla Valley State Prison	19025 Wiley's Well Rd. Blythe, CA	CA Dept. of Corrections & Rehabilitation	Existing	1,080	State prison providing long-term housing and services for male felons classified as medium and low-medium custody inmates jointly located on 1,720 acres of state-owned property. Assessor's Parcel Numbers (APNs) 879040006, 008, 012, 027, 028, 029, 030
3	Ironwood State Prison	19005 Wiley's Well Rd. Blythe, CA	CA Dept. of Corrections & Rehabilitation	Existing	640	ISP jointly occupies with Chuckawalla Valley State Prison 1,720 acres of state-owned property, of which ISP encompasses 640 acres. The prison complex occupies approximately 350 acres with the remaining acreage used for erosion control, drainage ditches, and catch basins. APNs 879040001, 004, 009, 010, 011, 015, 016, 017, 018, 019, 020
4	Devers-Palo Verde 1 Transmission Line	From Palo Verde (Arizona) to Devers Substation	SCE	Existing	N/A	Existing 500 kV transmission line parallel to I-10 from Arizona to the SCE Devers Substation, near Palm Springs. DPV1 will loop into the CRS (See Table 4.1-4), which will be located 10 miles southwest of Blythe (SCE, 2011).
5	Blythe Energy Project II; CACA 048811	City of Blythe, north of I-10, 7 miles west of the CA/AZ border	Blythe Energy, LLC	Existing	76	520 MW combined-cycle natural gas-fired electric-generating facility. Project is connected to the Buck Substation owned by the Western Area Power Administration (WAPA).
6	West-wide Section 368 Energy Corridors	Riverside County, parallel to DPV corridor	BLM, DOE, U.S. Forest Service	Approved by BLM and U.S. Forest Service	N/A	Designation of corridors on federal land in the 11 western states, including California, for oil, gas, and hydrogen pipelines and electricity transmission and distribution facilities (energy corridors). One of the corridors runs along the southern portion of Riverside County.
7	Eagle Mountain Pumping Plant	Eagle Mountain Road, west of Desert Center	Metropolitan Water District of Southern California	Existing		144 ft. pumping plant that is part of the Metropolitan Water District of Southern California's facilities. APNs 807150007, 807150009, 807150010
8	Recreational Opportunities	Eastern Riverside County	BLM	Existing	N/A	BLM has numerous recreational opportunities on lands in eastern Riverside County along the I-10 corridor including the Wiley's Well Campground, Coon Hollow Campground, and multiple LTVAs.
9	Kaiser Mine	Eagle Mountain, north of Desert Center	Kaiser Ventures, Inc.	Existing		Kaiser Steel mined iron ore at Kaiser Mine in Eagle Mountain and provided much of the Pacific Coast steel in the 1950s. Mining project also included the Eagle Mountain Railroad, 51 miles long. Imported steel captured market share in the 1960s and 1970s and primary steelmaking closed in the 1980s. APN 701380031

TABLE 4.1-3 (Continued)
EXISTING PROJECTS ALONG THE I-10 CORRIDOR (Eastern Riverside County)

ID #	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
10	Blythe Energy Project Transmission Line; 99-AFC-8C	From the Blythe Energy Project (Blythe, CA) to Julian Hinds Substation	Blythe Energy, LLC	Existing	N/A	Transmission line modifications including upgrades to Buck Substation, approximately 67.4 miles of new 230 kV transmission line between Buck Substation and Julian Hinds Substation, upgrades to the Julian Hinds Substation, installation of 6.7 miles of new 230 kV transmission line between Buck Substation and SCE's DPV 500 kV transmission line.
11	Blythe PV Project	Blythe	First Solar	CPUC approved project terms of a 20 year power purchase agreement for sale of 7.5 MW, Began operations in December 2009	200	7.5 MW solar photovoltaic project located on 200 acres. Project was constructed by First Solar and sold to NRG Energy.
12	Chuckwalla Valley Raceway	Desert Center Airport (no longer a community airport)	Developer Matt Johnson	Existing	400	Proposed 500-mile race track located on 400 acres of land that used to belong to Riverside County and was used as the Desert Center Airport. APNs 811-142-016, 811-142-006. Small private airstrip kept as part of project. Construction completed in March 2010.

SOURCE: BLM, 2011g

TABLE 4.1-4
REASONABLY FORESEEABLE PROJECTS ALONG THE I-10 CORRIDOR (Eastern Riverside County)

ID #	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
A	Three Commercial Projects	Blythe, CA	Various	Approved	N/A	Three commercial projects have been approved by the Blythe Planning Department including the Agate Road Boat & RV Storage, Riverway Ranch Specific Plan, and Agate Senior Housing Development.
B	Intake Shell	Blythe, CA		Under Construction	N/A	Reconstruction of a Shell facility located at Intake & Hobson Way. Demolition occurred in 2008, reconstruction planned for 2009-2010.
C	Fifteen Residential Developments	Blythe, CA	Various	Approved/ Under Construction	N/A	Twelve residential development projects have been approved by the Blythe Planning Department including: Vista Palo Verde (83 Single Family Residential [SFR]), Van Weelden (184 SFR), Sonora South (43 SFR), Ranchette Estates (20 SFR), Irvine Assets (107 SFR), Chanslor Village (79 SFR), St. Joseph's Investments (69 SFR), Edgewater Lane (SFR), The Chanslor Place Phase IV (57 SFR), Cottonwood Meadows (103 Attached SFR), Palo Verde Oasis Phase IV (29 SFR). Three residential development projects have been approved and are under construction including: The Chanslor Phase II & III (78 SFR), River Estate at Hidden Beaches, Mesa Bluffs Villas (26 Attached SFR).
D	Devers-Palo Verde 2 Transmission Line Project; CPUC Application No. A.05-04-015; CACA 048771	From the Midpoint Substation to Devers Substation (CA-only portion*)*	SCE	CPUC Petition to Modify Request to construct CA-only portion was approved by CPUC November 2009. DPV2 to Arizona was originally approved by CPUC in June 2007but not pursued by SCE after 2009. BLM ROD approving the project issued July 2011. CA-only portion is scheduled to begin construction December 2011.	N/A	New 500 kV transmission line parallel to the existing Devers-Palo Verde Transmission Line from Midpoint Substation, approximately 10 miles southwest of Blythe, to the SCE Devers Substation, near Palm Springs. The ROW for the 500 kV transmission line would be adjacent to the existing DPV ROW and would require an additional 130 feet of ROW on federal and State land and at least 130 feet of ROW on private land and Indian Reservation land.
E	Colorado River Substation Expansion; CPUC Application No. A.05-05-015	10 miles southwest of Blythe	SCE	Approved by CPUC 11/2009. Application for expansion filed with CPUC in 11/2010. Expansion currently under environmental review.	90	The substation was approved by the CPUC (as the "Midpoint Substation") but is proposed to be expanded as a 500/230 kV substation and would be constructed in an area approximately 1,000 feet by 1,900 feet, permanently disturbing approximately 90 acres. The 500 kV switching station would include buses, circuit breakers, and disconnect switches. The switchyard would be equipped with 108-foot-high dead-end structures. Outdoor night lighting would be designed to illuminate the switchrack when manually switched on. The Draft Supplemental EIR was published by the CPUC in February 2011.
F	Desert Southwest Transmission Line; CACA 044491	118 miles primarily parallel to DPV	Imperial Irrigation District	Final EIR/EIS prepared in 2005. Approved by the BLM in 2006.	N/A	New, approximately 118-mile 500 kV transmission line from a new substation/switching station near the Blythe Energy Project to the existing Devers Substation located approximately 10 miles north of Palm Springs, California.

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

ID #	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
G	Eagle Mountain Pumped Storage Project; FERC 13123-002	Eagle Mountain iron ore mine, north of Desert Center	Eagle Crest Energy Company	License application filed with FERC in June 2009. EIR published in mid-2010; FERC Draft EIS published in December 2010.	1,524	1,300 MW pumped storage project designed to store off-peak energy to use during peak hours. The captured off-peak energy would be used to pump water to an upper reservoir. When the water is released to a lower reservoir through an underground electrical generating facility the stored energy would be added into the Southwestern grid during "high demand peak" times, primarily weekdays. Estimated water use is 8,100 AFY for the first 4-year start-up period and replacement water is 1,763 AFY thereafter (Eagle Crest Energy Company, 2009).
H	Palen Solar Energy Project; CACA 048810	North of I-10, 10 miles east of Desert Center	Solar Millennium LLC/Chevron Energy	Approved by CEC in December 2010. Undergoing environmental review by BLM. Proposed to have one unit online in 2012 and one unit online in 2013.	5,200	500 MW solar trough project on 5,200 acres. Facility would consist of two 250 MW plants disturbing approximately 3,870 acres. Project would include interconnection to the SCE Red Bluff Substation. Project would use an estimated 300 AFY of water.
I	enXco McCoy; CACA 049490	10 miles northwest of Blythe	enXco	Plan of Development submitted to the BLM Palm Springs-South Coast Field Office	12,837	300 MW solar photovoltaic project on 12,837 acres. Project would require a 14-mile transmission line to proposed SCE Colorado River Substation south of I-10. Would use 575-600 AFY of water.
J	Genesis Solar Energy Project; CACA 48880	North of I-10, 25 miles west of Blythe and 27 miles east of Desert Center	NextEra (FPL)	Began construction in December 2010, expected to be in operation by July, 2014.	4,640	250 MW solar trough project on 4,640 acres north of the Ford Dry Lake. Project includes six-mile natural gas pipeline and a 5.5-mile gen-tie line to the Blythe Energy Center to Julian Hinds Transmission Line, then travel east on shared transmission poles to the Colorado River Substation (NextEra, 2011).
K	Chuckwalla Solar I; CACA 048808	1 mile north of Desert Center	Chuckwalla Solar I, LLC	Plan of Development submitted to the BLM Palm Springs-South Coast Field Office September, 2006.	4,082	200 MW solar photovoltaic project on 4,082 acres. Project would be developed in several phases and would tap into an existing SCE 161-kV transmission line crossing the site.
L	Rice Solar Energy Project; CACA 051022	Rice Valley, Eastern Riverside County	Rice Solar Energy, LLC (SolarReserve, LLC)	Pre- Application Review with the Riverside County Planning Department on 6/27/2011 Final EIS published on June 10, 2011	1,410	150 MW solar power tower project with liquid salt storage. Project is located on approximately 1,410 acres and includes a power tower approximately 650 feet tall and a 10-mile long interconnection with the WAPA Parker-Blythe transmission line.
M	Blythe Airport Solar I Project	Blythe Airport	U.S. Solar	City of Blythe approved the project in November, 2009 Building Permit applied for December, 2010	640	100 MW solar photovoltaic project located on 640 acres of Blythe airport land.
N	Blythe Solar Power Project; CACA 48811	North of I-10, immediately north of the Blythe Airport	Solar Millennium LLC/Chevron Energy	Approved by CEC and BLM in 2010; Project activity temporarily suspended due to solar technology change.	9,400	1,000 MW solar trough facility on 9,400 acres.

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

ID #	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
O	Desert Quartzite; CACA 049397	South of I-10, 8 miles southwest of Blythe	First Solar (previously OptiSolar)	Plan of Development submitted to the BLM Palm Springs-South Coast Field Office	7,245	600 MW solar photovoltaic project located on 7,245 acres. Adjacent to DPV transmission line and SCE Colorado Substation. Approximately 27 AF of water would be used during construction and 3.8 AFY during operation.
P	Desert Sunlight; CACA 48649	North of Desert Center	Desert Sunlight Holdings, LLC	Began construction in September 2011, expected to be in operation by 2015 (First Solar, Inc., 2011a).	4,144	250 MW solar photovoltaic project located on 4,144 acres. Project would tie into the SCE Red Bluff Substation. Approximately 27 AF would be used during construction and 3.8 AFY during operation (First Solar, Inc., 2011b).
Q	Red Bluff Substation' CPUC 10-11-012	Adjacent to the south side on I-10, east of Aztec Road, and west of Corn Springs Road, in unincorporated Riverside County	SCE	Began construction in September 2011, expected to be operational by December 2013	75	220/500 kV Substation. Planned to interconnect renewable projects near Desert Center with a DPV transmission line.
R	Desert Harvest Project; CACA 049491	6 miles north of Desert Center	enXco	Plan of Development submitted to the BLM Palm Springs-South Coast Field Office. Application date November, 2007.	1,207	150 MW photovoltaic plant on 1,207 acres of BLM land. Would require a 5- to 8-mile transmission line to planned SCE Red Bluff Substation.
S	Eagle Mountain Landfill Project; CACA-30070 CACA-25594 CACA-31926	Eagle Mountain, North of Desert Center	Mine Reclamation Corporation and Kaiser Eagle Mountain, Inc.	US Court of Appeals for the Ninth Circuit issued its opinion regarding the EIS for the project in 11/09 and ruled that the land exchange for the project was not properly approved by the administrative agency. Kaiser's Mine and Reclamation is considering all available options.	3,500	The project is proposed to be developed on a portion of the Kaiser Eagle Mountain Mine in Riverside County, California. The proposed project comprises a Class III nonhazardous municipal solid waste landfill and the renovation and repopulation of Eagle Mountain Townsite. The proposal by the proponent includes a land exchange and application for rights-of-way with the Bureau of Land Management and a Specific Plan, General Plan Amendment, Change of Zone, Development Agreement, Revised Permit to Reclamation Plan, and Tentative Tract Map with the County. The Eagle Mountain landfill project proposes to accept up to 20,000 tons of non-hazardous solid waste per day for 50 years.
T	RCL00161R1	North of I95, east of Intake Blvd	N/A	Reclamation Plan applied for September, 2009	N/A	Expansion of gravel pit from 12.95 acres to 38 acres.
U	BGR100258	Ehlers Blvdand W Chanslor Way	N/A	Grading Permit applied for November, 2010	N/A	Grading permit for 9000 square foot church
V	BNR100126	8 miles south of the intersection of HWY 177 and HWY 10.	U.S. Solar	Building Permit applied for December, 2010	400	49.5 MW solar PV plant (PP24754)

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

ID #	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
W	CUP03602	South of Nicholls Warm Springs, approximately 8 miles west of Blythe.	N/A	Conditional Use Permit approved April, 2009	200	21 MW photovoltaic facility on 200 acres (Riverside County ALUC, 2008)
X	Palo Verde Mesa Solar Project	East of Blythe Solar project, South of Gypsum Solar project.	Renewable Resources Group, Inc.	Conditional Use Permit applied for September, 2011	3,250	Up to 486 MW solar PV generating facility. The project would include a solar panel array, two on-site electrical substations, a maintenance building, and ancillary facilities. A 14.7-mile 230 kV transmission line would cross lands under County, City of Blythe, and BLM jurisdiction to connect to the Colorado River Substation (Riverside County Planning Department, 2012).
Y	Gypsum Solar; CACA 051950	Approximately 7 miles north of Blythe, Ca.	Ridgeline Energy LLC	BLM application pending. Application date March, 2010	3000	50-100 MW solar PV or concentrated PV energy facility. The project would include a solar panel array, a maintenance building, an administration building, a raw water storage tank, a demineralized water tank, a potable water tank, and a 230 kV or lower transmission line and substation (Ridgeline Energy, LLC, 2010a).
Z	Palo Verde 2; CACA 051967	Approximately 13 miles west of Blythe, Ca. South of I-10	BrightSource Energy	BLM application pending. Application date May, 2009. Estimated start of construction 2012.	12,300	1,000 MW concentrated solar power project. Up to five interconnected power plants, each capable of generating 200 MW, would be constructed. Each plant would have a solar field with a power tower and a power block. The solar fields would have four circular mirror arrays focusing light on a dedicated power tower, Each power block would contain a substation that would connect to a project substation (BrightSource, 2009).
AA	Eagle Mountain; CACA 51664	Eagle Mountain, north of Desert Center	L.H. Renewables	BLM application pending. Application date December, 2009	2,690	Wind energy testing facility consisting of two meteorological towers. Each tower would be 197 feet high and would passively collect and record data year round. Total disturbance would be 1.13 acres for both towers (BLM, 2011h).
AB	Desert Center II; CACA 052344	4 miles north east of Desert Center	Ridgeline Energy, LLC	BLM application pending. Application date September, 2010	260	20 MW solar PV project occupying 130 acres of a 260 acre ROW area. The facility would utilize a single-axis tracking system. Transmission infrastructure would be built over a 350 foot span to connect with the existing SCE 161 kV Blythe-Eagle Mountain transmission line (Ridgeline Energy, LLC, 2010b).
AC	Rio Mesa Solar Electric Generating Facility; CACA 53138	Approximately 11 miles south west of the City of Blythe	BrightSource Energy	Plan of Development submitted to the BLM Moreno Valley Field Office in July, 2011. Application for Certification submitted to the CEC in October, 2011. If approved, construction would begin in the fourth quarter of 2013.	5,750	750 MW concentrated solar power project composed of three power plants and a common area with shared facilities. Each 250 MW solar concentration power plant would utilize a solar power boiler and solar field based on heliostat mirror technology. A new generation tie line would be constructed to connect to the new SCE Colorado River Substation.

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

ID #	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
Additional Projects Outside Cumulative Figure Boundaries						
	Paradise Valley "New Town" Development	Approximately 30 miles west of Desert Center (7 miles east of the city of Coachella)	Glorious Land Company	Notice of Preparation of an EIR published in December of 2005. Still under environmental review.	6,397	Company proposed to develop a planned community as an international resort destination with residential, recreational, commercial, and institutional uses and facilities. The project is planned as a self-contained community with all public and quasi-public services provided. The project is located outside the Coachella Valley Water District (CVWD) boundaries and the applicant has entered into an agreement with the CVWD to manage artificial recharge of the Shaver's Valley groundwater. The proponent has purchased a firm water supply from Rosedale-Rio Bravo Water District in Kern County. In-kind water would be transferred to the MWD which would release water from the Colorado River Aqueduct to a 38 acre percolation pond on the project site. The MWD would deliver approximately 10,000 AFY to the percolation pond and over the long term, no net loss of groundwater in storage is anticipated.
	Mecca Specific Plan	North of Salton Sea, east of community of Mecca, southeast of City of Coachella.	Mecca Group LLC	NOP of an EIR published in June 2008. Still under environmental review.	2,934	The proposed project includes 19,476 units with a mix of low-, medium- and high-density residential development. Non-residential uses include retail/commercial, mixed use, a golf course, and open space with civic uses and agricultural buffers. The Specific Plan incorporates existing residential, commercial, industrial, and civic uses with a blend of proposed low-, medium- and high-density residential and commercial land uses. The proposed General Plan Amendment and Change of Zone would be changed to Specific Plan and Specific Plan zoning.
	Proposed National Monument (former Catellus Lands)	Between Joshua Tree National Park and Mojave National Preserve		In December 2009, Senator Feinstein introduced bill S.2921 that would designate two new national monuments including the Mojave Trails National Monument.	941,000 acres	The proposed Mojave Trails National Monument would protect approximately 941,000 acres of federal land, including approximately 266,000 acres of the former railroad lands along historic Route 66. The BLM would be given the authority to conserve the monument lands and also to maintain existing recreational uses, including hunting, vehicular travel on open roads and trails, camping, horseback riding and rockhounding.
	Solar Energy projects along Arizona border	Approximately 15 miles east of the CA/ AZ border along I-10 corridor	Various	Applications filed in to Arizona BLM field offices, application status listed as pending.	225,000	Thirteen solar trough and solar power tower projects have been proposed along the I-10 corridor approximately 15 miles east of the CA/AZ border. The projects have been proposed on BLM administered-land in the Yuma and Kingman Field Offices.

SOURCE: Van Dyke, 2011; CEC 2010, BLM 2011a, b, c, d; DOE and BLM, 2011.

The specific area of cumulative effect varies by resource. The BLM has identified the California desert as the largest area within which cumulative effects should be assessed for most resources; however, the appropriate geographic area of cumulative consideration is far smaller than the California desert for some resources and, for others, such as climate change and golden eagles, it is much larger. For each resource, the geographic scope of analysis in the PA/FEIS is based on the natural boundaries and physical conditions relevant to the resource affected, rather than jurisdictional boundaries. The geographic scope of cumulative effects often extends beyond the scope of the direct effects, but not beyond the scope of the direct and indirect effects of the Proposed Action and alternatives. Table 4.1-1 identifies the relevant geographic scope for each resource's analysis of cumulative impacts.

In addition, each project in a region would have its own implementation schedule, which may or may not coincide or overlap with the Proposed Action's schedule. This can impact the conclusions related to short-term impacts from activities such as construction of the Project. To be conservative, the cumulative analysis assumes that all projects in the cumulative scenario are built and operating during the operating lifetime of the Project.

4.1.5.1 Known Actions and Activities in the Cumulative Scenario

Existing actions and activities along the I-10 corridor in Eastern Riverside County (including existing BLM-authorized actions) are identified in Table 4.1-3. Reasonably foreseeable future projects along the I-10 corridor in Eastern Riverside County are identified in Table 4.1-4.

4.1.5.2 Renewable Energy Projects Included in the Cumulative Scenario

A large number of renewable projects have been proposed on BLM-managed land, state land, and private land in California. As of November 2011, there were approximately 120 renewable projects proposed in California in various stages of the environmental review process or under construction. Solar, wind, and geothermal development applications have requested use of BLM land, including approximately one million acres of the California desert. State and private lands have also been targeted for renewable energy projects. In addition, approximately 50 applications for solar, wind, and geothermal projects are being considered on BLM land in Nevada and Arizona (BLM 2011e, f). Renewable energy projects in BLM's California Desert District are identified in Table 4.1-2.

Large renewable projects now described in applications to the BLM and on private land are competing for utility Power Purchase Agreements, which will allow utilities to meet state-required Renewables Portfolio Standards. Not all of the projects listed will complete the environmental review process or be approved, and not all projects will be funded and ultimately constructed.

4.1.6 Mitigation Measures Included in the Analysis

For impacts identified in the following resource sections, measures have been developed to avoid or reduce potential environmental effects that would be implemented during all appropriate phases of the project from initial ground breaking and construction, to operation and maintenance, and through closure and decommissioning. The measures include a combination of the following:

1. Measures that have been proposed by the applicant (APMs);
2. Regulatory requirements of other federal, state, and local agencies;
3. USFWS terms and conditions identified in the BO; and
4. Additional BLM-proposed mitigation measures; ROW grant terms and conditions; and best management practices.

These requirements generically are referred to as "mitigation measures" throughout this PA/FEIS. Because these mitigation measures are derived from a variety of sources, they also are required, and their implementation regulated, by the various agencies. The Applicant would prepare an Environmental and Construction Compliance Monitoring Plan (ECCMP)/Mitigation Monitoring, Reporting, and Compliance Program (MMRCP) ensuring the effective implementation of the mitigation measures identified to address Project impacts. An initial preliminary draft compilation of mitigation measures for the MSEP is provided in Appendix M, Summary of Bureau of Land Management Mitigation and Monitoring.

Many of the other mitigation measures are required by agencies other than the BLM and their implementation would be enforced by those other agencies against the Applicant. For instance, USFWS's FESA §7 Reasonable and Prudent Measures will be included in the ROD, and the NHPA §106 Memorandum of Agreement (MOA), a draft of which is provided in Appendix L, will include a number of obligations enforceable by signatories SHPO and ACHP, that also will be included in the ROD. The Applicant would be required by the ROD and the ROW grant to comply with the requirements of those other agencies (see, e.g., 43 CFR §2805.12(a) (federal and state laws and regulations), §2805.12(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.

4.1.7 Terms and Conditions found in FLPMA and BLM ROW Regulations

Title V of FLMPA addresses the issuance of ROW authorizations on public land. The general terms and conditions applicable to all public land ROWs are described in FLPMA §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, additional terms and conditions will be incorporated into the ROW grant that are necessary to protect public safety, including security fencing and on-site personnel. The environmental consequences analysis in this PA/FEIS identifies impacts and mitigation measures to reduce or avoid impacts. The mitigation measures identified by the BLM and incorporated as terms and conditions of the ROW grant provide those actions necessary to prevent unnecessary or undue degradation of the public lands as required by FLPMA §302. The additional mitigation measures that are identified and described in the PA/FEIS and that would be enforced by the other agencies, as noted above, provide additional protection to public land resources.

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

If the ROW grant is authorized, the BLM will monitor conditions and review any ROW grant stipulations and terms and conditions issued for the Project to evaluate if future changes to the grant are necessary or justified under this provision of the regulations to further minimize or reduce impacts resulting from the Project. Changes may be subject to additional NEPA analysis.

If approved, the solar energy ROW authorization would 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 (AO) the authority to suspend or terminate the authorization (43 CFR §2807.17).

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

4.2 Air Resources

4.2.1 Methodology for Analysis

This analysis of potential air resources-related impacts of the Proposed Action and alternatives is based on technical information associated with criteria pollutant estimates, public health risk, and cumulative impacts that would be generated during construction, operation and maintenance, and decommissioning of the Project. The majority of the technical information was prepared by AECOM for the Applicant (AECOM, 2012) and peer reviewed by BLM and Riverside County staff and consultants. In addition, to supplement the technical information prepared by AECOM, ESA prepared a fugitive dust emissions estimate for paved road travel during construction (ESA, 2012).

4.2.1.1 Construction Emissions

Construction emissions were estimated using Project-specific information provided by the Applicant's engineering contractor. The data provided includes the overall construction schedule of 46 months assumed to occur from March, 2013, through December, 2016, divided into different phases of construction for each unit. The air quality technical report (AECOM, 2012) and the paved road fugitive dust emissions estimate calculations (ESA, 2012) are the sources of all assumptions used to estimate the construction emissions that would be associated with the Project. For the purposes of the air quality analysis, it is assumed that the Project would be constructed in six broad phases: Phase 1 - Mobilization; Phase 2 - Civil Improvements; Phase 3 - Photovoltaic Panel Construction; Phase 4 - Office/Structure Building Construction; Phase 5 - Transmission Line Construction; and Phase 6 - System Testing and Commissioning. For each of these phases during construction of each unit, the engineering contractor provided the following information:

1. A list of the types of construction equipment and vehicles to be used;
2. The number of pieces of each type of equipment and vehicle;
3. Daily usage rates in terms of hours per day and miles per day for each piece of equipment vehicle, respectively; and
4. The power rating for each type of equipment used.

Off-Road Equipment Exhaust

Criteria pollutant emissions, including CO, VOC, NO_x, SO_x, PM10, and PM2.5, from off-road construction equipment use were estimated using the Urban Emissions (URBEMIS) 2007 Version 9.2.4 computer model, in accordance with the MDAQMD guidelines. URBEMIS is designed to model construction emissions for land use development projects and allows for the input of project-specific information. Emissions from equipment used during each of the six construction phases were modeled separately in the construction module of URBEMIS. The construction module can estimate emissions from seven construction stages, including demolition, mass site grading, fine site grading, trenching, building construction, architectural coating, and paving. Exhaust emissions from the equipment were modeled using the module's building construction stage. Fugitive VOC emissions from asphalt paving were modeled using the module's paving stage. For each phase of construction, the model defaults for the type of equipment used, number of pieces of equipment, power rating, and daily usage rate were replaced by Project-specific information provided by the Applicant's engineering contractor for the Project. The default load factors for off-road equipment were modified to reflect the revised load factors proposed by ARB in the *Amendments to the Regulations for In-Use Off-Road Diesel-Fueled Fleets and Off-Road Large Spark Ignition Engine Fleet Requirements* (ARB, 2010). URBEMIS derives the emission factors and load factors for in-use off-road equipment from ARB's OFFROAD2007 model. Recent studies have indicated that the OFFROAD2007 model over-predicts these load factors by about 33 percent. Therefore, the default load factors in URBEMIS were replaced with the revised load factors proposed by ARB in these amendments.

As the duration of each phase and year of activity are different for Unit 1 and Unit 2, emissions for each unit were calculated with the emissions model separately. Details of the calculations and model input and output are provided in Attachment 1-A of the air quality technical report, *Construction Equipment Emission* and a summary of all criteria pollutant emissions estimated to be generated during construction is provided in Attachment 1-D, *Summary of Criteria Pollutant Emissions* (AECOM, 2012).

On-Road Motor Vehicle Exhaust Emissions

The combustion of fuel in motor vehicle engines results in the generation of CO, VOC, NO_x, SO_x, PM10, and PM2.5 emissions. Motor vehicle brake and tire wear results in the generation of PM10 and PM2.5 emissions. Emissions from motor vehicles used during construction were estimated outside of the URBEMIS model. Emissions from motor vehicles were calculated by multiplying the vehicle-miles-traveled (VMT) by each type of vehicle estimated to be used during the construction phase by emission factors that were compiled by running the ARB's EMFAC2007 (version 2.3) Burden Model for the MDAQMD jurisdiction during calendar year 2013. Daily emissions by vehicle class (e.g., light-duty trucks, heavy duty trucks, heavy-heavy duty diesel vehicle, etc.) from the EMFAC2007 model were divided by the estimated daily mileage traveled by the vehicles to calculate the associated emissions. In addition, the PM10 emission factors account for exhaust, brake wear, and tire wear emissions separately.

PM2.5 emission factors were calculated by multiplying the PM10 emission factors by the mass fraction of PM2.5 emissions in PM10 motor vehicle exhaust, brake wear, and tire wear emissions, as provided by SCAQMD's *Final–Methodology to Calculate Particulate Matter (PM) 2.5 and PM2.5 Significance Thresholds* (2006). The motor vehicle emission factors from the EMFAC2007 model and the calculated PM2.5 emission factors are listed in Table 1-A of the air quality technical report, and the motor vehicle emission factors for the specific vehicles to be used during construction of the Project are listed in Table 2 of Attachment 1-C, *Construction Vehicle Emissions* (AECOM, 2012).

Monthly emissions were calculated by multiplying the monthly VMT by the EMFAC2007 vehicle emission factors. Emissions from both on-site and off-site vehicles were estimated. Monthly VMT amounts are based on data provided by the Applicant's engineering contractor, and include the number of motor vehicles to be operated each day for each phase of construction, the daily round-trip distance travelled by each vehicle, and an average of 22 working days per month. Project construction emissions were estimated for each month from March 2013 through December 2016, and annual emissions were estimated by summing the estimated monthly totals for a given year. These data are provided in air quality technical report Tables 3 through 8 of Attachment 1-C, *Construction Vehicle Emissions* (AECOM, 2012). On-site vehicles include water trucks, service trucks, concrete trucks, etc. Off-site vehicles include mainly worker commute vehicles and equipment and material delivery trucks, including trucks delivering PV panels. Different types of equipment and material would be delivered to the site from different regions within California, Arizona, and Nevada resulting in different round-trip distances. For the purpose of comparing criteria pollutant emissions to the MDAQMD thresholds, off-site vehicle emissions were estimated only for emissions that would be generated within the MDAB.

Fugitive Dust Emissions

On-Site Construction Activities

Earth-disturbing activities such as excavation, filling, grading, and vehicle travel during construction of the Project would generate fugitive dust emissions, including emissions of PM10 and PM2.5. Maximum daily fugitive particulate matter emissions generated at the Project site during construction were modeled separately using the URBEMIS construction site grading stage module. To estimate fugitive dust emissions, URBEMIS uses the methodology developed for the SCAQMD by Midwest Research Institute. That four-tiered methodology allows for more refined estimates based on the level of detail known for the construction project. The first tier (default level of detail) was selected for this Project. The default worst-case emission factor for fugitive dust provided by URBEMIS for this tier is 38.2 pounds PM10 per day per acre disturbed.

The AECOM emissions estimates for the Project assume implementation of standard dust control measures (e.g., application of water and/or dust suppressants on unpaved roads and on exposed and stockpiled soils, use of enclosures and minimum freeboard on material haul trucks, and limiting vehicle speeds on unpaved roadways) that would achieve a combined control efficiency rating of 68 percent. The combined 68 percent control efficiency rating is based on control efficiency ratings identified by SCAQMD for various individual dust control measures (SCAQMD, 2007).

It should be noted that the SCAQMD control efficiency ratings are unique for various types of construction activities; for example, applying water to disturbed areas would result in a control efficiency of approximately 61 percent related to general soil disturbance activities, limiting on-site vehicle speeds to 15 mph on unpaved roads would result in a control efficiency of 57 percent related to vehicle travel on unpaved roads, and covering trucks with loose loads and maintaining at least 12 inches of freeboard would result in a control efficiency of 91 percent associated with loose material hauling. Given that the fugitive dust emission estimates for the Project have been estimated using a default emission factor that accounts for all on-site activities (as opposed to specific on-site activities), it is not possible to estimate the exact combined control efficiency rating that would be associated with the standard control measures. However, considering the SCAQMD control efficiency rates identified above, it is reasonable to assume that the combined control efficiency of the standard dust control measures would achieve a total control efficiency rating of 68 percent relative to the 38.2 pounds per day per acre disturbed default emission factor.

URBEMIS estimates the annual fugitive dust emissions during a calendar year by multiplying the maximum daily fugitive dust emissions by the number of working days in that year. However, this calculation results in an overestimate of annual fugitive dust emissions as the maximum daily fugitive dust emissions that would be associated with the Project would not occur each day. Therefore, in order to provide a more accurate estimate of annual on-site fugitive dust emissions, the annual on-site fugitive dust emissions were not calculated with the URBEMIS model: they were calculated using the estimated daily acreage to be disturbed during each month instead of the maximum daily acreage to be disturbed during the construction phase. Monthly on-site fugitive dust emissions were calculated by multiplying the pounds per day per acre disturbed emission factor by the daily acreage disturbed for each construction month and the number of working days per month. Annual on-site fugitive dust emissions were estimated as a sum of monthly emissions during the calendar year.

The desert pavement located at the Project site is of the mature variety; therefore, it is not subject to a great deal of wind erosion. Because of the natural deterrent effect on wind erosion caused by desert pavement terrain, the Applicant has proposed to minimize the disruption of desert pavement during construction of the Project. For instance, vehicle and equipment use would be constrained to the active construction areas and roads. If the desert pavement is disturbed (e.g., by vehicles traversing it), the loosened particles could become airborne during windy conditions. Therefore, the Applicant has proposed a measure to avoid disturbance of the desert pavement to maintain the desert pavement and to minimize fugitive dust emissions due to wind erosion during this phase (see Section 4.2.2). Fugitive dust impacts related to loss of desert pavement are assessed qualitatively.

Off-Site Construction Activities

With regard to off-site fugitive dust construction emissions, all off-site vehicle travel would occur on paved roads, so there would be no fugitive dust generated off-site related to vehicle travel on unpaved roads. For paved road vehicle travel dust emissions, the AECOM emission estimates have been supplemented with a fugitive dust calculation for off-site travel on paved roads using USEPA methodology identified in its AP-42 document (USEPA, 2011). Maximum daily and annual trip amounts were derived from data provided in AECOM's air quality technical report, Tables 3 through 8 of Attachment 1-C, Construction Vehicle Emissions (AECOM, 2012). The total miles that would be travelled on Black Rock Road and the Project access road for each round trip have been estimated to be 20 miles. This amount was multiplied by the AP-42 predictive emission factor Equation 2 with appropriate variables as identified in AP-42 Section 13.2.1, Paved Roads. The AP-42 emission factor includes a minor reduction factor associated with an assumed 20 "wet" days when at least 0.01 inch of precipitation would fall during the year, but no other emission controls are assumed for the paved road travel dust emissions estimates.

Public Health Risk

The primary hazardous air pollutant emission associated with the Project and alternatives would be DPM emissions from construction equipment. Small quantities of other hazardous air pollutants would be associated with gasoline-fueled vehicles also operating on-site during construction. The location of hazardous pollutant emissions from construction equipment operation would vary across the Project site over the construction period, and thus would not be in a fixed location for long periods of time. The MDAQMD CEQA Guidelines state that an industrial project within 1,000 feet of a sensitive receptor must be evaluated quantitatively to determine if it would expose sensitive receptors to substantial pollutant concentrations based on the criteria presented in the guidelines (MDAQMD, 2011). Because there are no sensitive receptors within 1,000 feet of the Project site, and because there are only a few rural residences located between 2 and 3 miles of the Project site (over 10 times the 1,000-foot screening distance), health risks are assessed qualitatively and a full health risk assessment was not warranted for the Project.

4.2.1.2 Operation and Maintenance Emissions

Operation-related criteria pollutant emissions, including fugitive dust, would be generated from on-site equipment and on-site and off-site vehicle use.

On-Site Equipment Emissions

Off-road equipment on the Project site during operation and maintenance would consist of two 35-horsepower diesel-powered emergency (standby) generators. The operation of the generators would result in the generation of VOC, NO_x, CO, SO_x, PM10, and PM2.5 emissions. According to the California Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition (CI) §93115.9, these generators were assumed to be 2008-2012 model year engines and would comply with the interim Tier 4 off-road compression ignition engines exhaust emissions standards per California Code of Regulations Title 13, Division 3, Chapter 9, Article 4, §2423. The emission factors used for calculating emissions were assumed to be equal to these exhaust standards. Emissions from these diesel generators were estimated for a maximum of 1 hour per day and 50 hours per year of regular testing and maintenance operation. As the duration of emergency use cannot be predicted, emissions during possible emergency use were not included.

Motor Vehicle Emissions

Emissions from both on-site and off-site motor vehicles used during operation and maintenance were modeled using the Operation module in URBEMIS. On-site vehicles used during operation and maintenance include vehicles used for panel washing and other maintenance. Off-site vehicles include employee traffic and delivery trucks. The combustion of fuel in off-site and on-site vehicles would generate VOC, NO_x, CO, SO_x, PM10, and PM2.5 emissions. Motor vehicle brake and tire wear and travel on paved roads with entrained road dust also results in PM10 and PM2.5 emissions.

Emissions were modeled for the year 2017, the first year when the Project would become fully operational. As the proposed land use is not one of the default land uses available in URBEMIS, a user-defined land use was created, along with daily trip rate, trip length, and vehicle characteristics based on the information provided by the Applicant's engineering contractor. Details of the calculations and model input and output are provided in the air quality technical report, Attachment 2-B, *Operation Vehicles* (AECOM, 2012).

Fugitive Dust

The fugitive dust emission estimates for Project operation and maintenance were prepared by AECOM (2012) and include emission estimates for on-site unpaved road travel and off-site paved road travel. As described above in the construction context, the desert pavement located at the Project site is not subject to a great deal of wind erosion. Because of the natural deterrent effect on wind erosion caused by desert pavement terrain, the Applicant has proposed a measure to avoid disturbance of the desert pavement during operation to maintain the desert pavement and to minimize fugitive dust emissions due to wind erosion during this phase (see Section 4.2.2). Fugitive dust impacts related to loss of desert pavement are assessed qualitatively.

Public Health Risk

There would be few sources of hazardous air pollutant emissions other than limited on-site vehicle traffic at the Project site during facility operation and maintenance.

4.2.1.3 Decommissioning Emissions

Decommissioning-related impacts to air resources would be substantially similar to the construction-related impacts described above.

4.2.1.4 Impact Analysis

Independent of NEPA, federal CAA §176 requires federal agencies that are funding, permitting, or approving an activity to ensure the activity conforms to the applicable State Implementation Plan adopted to eliminate or reduce air quality violations (42 USC §7506). However, the study area has no nonattainment or maintenance designations for any federal AAQS. Consequently, formal CAA conformity requirements do not apply to federal agency actions related to the Proposed Action or alternatives. However, for the purposes of this analysis, the CAA conformity *de minimis* levels are used as mass emissions indicators for adverse annual emissions. The CAA conformity thresholds for maintenance areas (i.e., areas that currently meet federal air quality standards, but have violated the standards in prior years), which in the Project area are 100 tons per year per pollutant, are used in this analysis to gauge the potential for the Project and alternatives to result in an exceedance of National AAQS.

TABLE 4.2-1
MDAQMD AIR QUALITY THRESHOLDS

Criteria Pollutant	Annual Threshold (tons)	Daily Threshold (pounds)
Carbon Monoxide (CO)	100	548
Oxides of Nitrogen (NO_x)	25	137
Volatile Organic Compounds (VOC)	25	137
Oxides of Sulfur (SO_x)	25	137
Respirable Particulate Matter (PM10)	15	82
Fine Particulate Matter (PM2.5)	15	82
Hydrogen Sulfide (H_2S)	10	54
Lead (Pb)	0.6	3

SOURCE: MDAQMD, 2011.

Project-related construction and operation and maintenance mass exhaust and fugitive dust emissions are also compared to MDAQMD daily and annual thresholds to determine whether the Project or one of the action alternatives could result in an exceedance of the California AAQS.

4.2.2 Applicant Proposed Measures

The Applicant has committed to implementing the following APMs to minimize impacts on air resources from the Project. The impact analysis assumes that the APMs would be implemented as part of the Project to reduce potential impacts as discussed below:

AIR-1: To reduce construction-generated air quality impacts:

1. The main access roads through the facility to the unit substation areas shall be either paved or stabilized using soil binders, or equivalent methods, to provide a stabilized surface that is similar for the purposes of dust control to paving, that may or may not include a crushed rock (gravel or similar material with fines removed) top layer, prior to initiating construction in the unit substation areas.

2. All unpaved construction roads and unpaved operation and maintenance site roads, as they are being constructed, shall be stabilized with a non-toxic soil stabilizer or soil weighting agent that can be determined to be both as efficient or more efficient for fugitive dust control as ARB-approved soil stabilizers, and shall not increase any other environmental impacts including loss of vegetation to areas beyond where the soil stabilizers are being applied for dust control. All other disturbed areas in the project and linear construction sites shall be watered as frequently as necessary during grading; and after active construction activities shall be stabilized with a nontoxic soil stabilizer or soil weighting agent, or alternative approved soil stabilizing methods. The frequency of watering can be reduced or eliminated during periods of precipitation.

3. No vehicle shall exceed 10 miles per hour on unpaved areas within the site, with the exception that vehicles may travel up to 25 miles per hour on stabilized unpaved roads as long as such speeds do not create visible dust emissions.

4. Visible speed limit signs shall be posted at the site entrance(s).

5. All construction equipment vehicle tires shall be inspected and washed as necessary to be cleaned free of dirt prior to entering paved roadways.

6. Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.

7. All unpaved exits from the construction site shall be graveled or treated to prevent track-out to public roadways.

8. All construction vehicles shall enter the construction site through the treated entrance roadways.

9. All paved roads within the construction site shall be swept daily or as needed (less during periods of precipitation) on days when construction activity occurs to prevent the accumulation of dirt and debris.

10. At least the first 500 feet of any paved public roadway exiting the construction site or exiting other unpaved roads en route from the construction site or construction staging areas shall be swept as needed (less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or runoff resulting from the construction site activities is visible on the public paved roadways.

11. All soil storage piles and disturbed areas that remain inactive for longer than 10 days shall be covered, or shall be treated with appropriate dust suppressant compounds.

12. All vehicles that are used to transport solid bulk material on public roadways and that have potential to cause visible emissions shall be provided with a cover, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to provide at least one foot of freeboard.

13. Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) shall be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this measure shall remain in place until the soil is stabilized or permanently covered with vegetation.

14. The disruption of desert pavement shall be minimized to the extent feasible.

AIR-2: To reduce operation and maintenance-related air emissions:

1. The main access roads through the facility to the unit substation areas shall be either paved or stabilized using soil binders, or equivalent methods, to provide a stabilized surface that is similar for the purposes of dust control to paving, that may or may not include a crushed rock (gravel or similar material with fines removed) top layer, and delivery areas for operations materials (chemicals, replacement parts, etc.) shall be paved or treated prior to taking initial deliveries.

2. All unpaved operation and maintenance site roads shall be stabilized with a non-toxic soil stabilizer or soil weighting agent that can be determined to be both as efficient or more efficient for fugitive dust control as ARB approved soil stabilizers, and shall not increase any other environmental impacts including loss of vegetation to areas beyond where the soil stabilizers are being applied for dust control. After construction activities, all disturbed areas in the project and linear sites shall be stabilized with a nontoxic soil stabilizer or soil weighting agent, or alternative approved soil stabilizing methods.

3. No vehicle shall exceed 10 miles per hour on unpaved areas within the site, with the exception that vehicles may travel up to 25 miles per hour on stabilized unpaved roads as long as such speeds do not create visible dust emissions.

4. Visible speed limit signs shall be posted at the site entrance(s).

5. All vehicles that are used to transport solid bulk material on public roadways and that have potential to cause visible emissions shall be provided with a cover, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to provide at least one foot of freeboard.

6. The disruption of desert pavement shall be minimized to the extent feasible.

4.2.3 Alternative 1: Proposed Action

4.2.3.1 Direct and Indirect Impacts

Construction

Criteria Pollutant Emissions

The annual criteria pollutant emissions that would be generated within the MDAB during each calendar year during the Project's 46 months of construction have been estimated using the methodologies described above. The on-site PM10 and PM2.5 emissions estimates account for reductions from standard dust control measures, such as application of water and/or dust suppressants. The estimates for off-site fugitive dust and VOC, NO_x, CO, and SO_x exhaust include no control-related reductions. This analysis assumes that the control efficiency associated with the standard dust control measures would be 68 percent. As shown in Table 4.2-2, the annual emissions for all pollutants would be below the respective *de minimis* levels and MDAQMD thresholds. Therefore, it can be concluded that the Project would not result in or contribute to an exceedance of an annual AAQS.

TABLE 4.2-2
PROPOSED ACTION ANNUAL CONSTRUCTION EMISSIONS

Construction Year	Emission Source[a]	Annual Emissions (tons/year)					
		VOC	NO_X	CO	SO_X	PM10[b]	PM2.5[b]
Year 2013	Exhaust and on-site fugitive dust	1.5	9.9	10.1	<0.1	11.1	2.7
	Off-site dust	---	---	---	---	0.7	0.2
	Total	**1.5**	**9.9**	**10.1**	**<0.1**	**11.8**	**2.8**
Year 2014	Exhaust and on-site fugitive dust	1.7	9.1	15.0	<0.1	4.4	1.3
	Off-site dust	---	---	---	---	1.2	0.33
	Total	**1.7**	**9.1**	**15.0**	**<0.1**	**5.6**	**1.6**
Year 2015	Exhaust and on-site fugitive dust	1.7	8.8	15.5	<0.1	11.2	2.7
	Off-site dust	---	---	---	---	1.3	0.3
	Total	**1.7**	**8.8**	**15.5**	**<0.1**	**12.5**	**3.0**
Year 2016	Exhaust and on-site fugitive dust	1.9	8.4	20.3	<0.1	4.1	1.2
	Off-site dust	---	---	---	---	1.9	0.5
	Total	**1.9**	**8.4**	**20.3**	**<0.1**	**6.0**	**1.9**
de minimis level		100	100	100	100	100	100
MDAQMD Threshold		25	25	100	25	15	15
Exceeds Threshold?		No	No	No	No	No	No

NOTES:

[a] Exhaust and on-site fugitive dust emissions were estimated by AECOM (2012) and off-site fugitive dust emissions from vehicle travel on paved roads were estimated by ESA (2012).

[b] PM10 and PM2.5 emissions account for various on-site dust control measures resulting in a control efficiency of 68% relative to uncontrolled emissions; other pollutant emissions do not account for emissions control reductions.

SOURCES: AECOM, 2012; ESA, 2012.

Table 4.2-3 provides the estimated maximum daily criteria pollutant emissions that would be generated within the MDAB during construction of the Project. The maximum daily emissions for CO, VOC, SO_x, PM10, and PM2.5 would occur during Month 30, and the maximum daily emissions for NO_x would occur during Month 6. As with the annual emissions, it was assumed that the general fugitive dust control measures would achieve an overall efficiency of 68 percent relative to on-site construction activities (SCAQMD, 2007). As shown in Table 4.2-3, the maximum daily emissions for VOC, NO_x, CO, SO_x, and PM2.5 are below the respective MDAQMD thresholds. Therefore, it can be concluded that the Project would not result in or contribute to an exceedance of an applicable daily or hourly AAQS and the associated construction impacts would be adverse, but would not be substantial. With regard to PM10, the estimated maximum daily emissions would exceed the MDAQMD threshold, indicating that Project-related PM10 emissions could result in an exceedance of the state PM10 24-hour AAQS.

TABLE 4.2-3
PROPOSED ACTION MAXIMUM DAILY CONSTRUCTION EMISSIONS

Emission Source[a]	Maximum Daily Emissions (pounds/day)					
	VOC	NO_x	CO	SO_x	PM10[b]	PM2.5[b]
Off-road Equipment Exhaust	9	84	33	0.0	3	3
Vehicle Exhaust	14	50	185	0.3	4	3
On-site Fugitive Dust	0	---	0	---	110	23
Paved Road Fugitive Dust	0	---	0	---	19	5
Total Maximum Daily Emissions	23	135	218	0.3	136	34
MDAQMD Threshold	137	137	548	137	82	82
Exceeds Threshold?	No	No	No	No	Yes	No

NOTE: Total maximum daily NO_x emissions include a slight rounding error.

[a] Exhaust and on-site fugitive dust emissions were estimated by AECOM (2012) and off-site fugitive dust emissions from vehicle travel on paved roads were estimated by ESA (2012).

[b] PM10 and PM2.5 emissions account for various on-site dust control measures resulting in a control efficiency of 68 percent relative to uncontrolled emissions; other pollutant emissions do not account for emissions control reductions.

SOURCES: AECOM, 2012; ESA, 2012.

The maximum daily PM10 emissions shown in Table 4.2-3 include both combustion exhaust emissions and fugitive dust. Fugitive dust sources would contribute approximately 129 pounds out of the 136 pounds of the total maximum daily PM10 emissions. To reduce fugitive dust emissions during construction, the Applicant has proposed to implement APM AIR-1, which includes various construction dust control measures, including frequent watering of disturbed areas during grading, increased use of soil stabilizers on roads during construction, installation of gravel ramps, and street sweeping to reduce accumulation of dirt, etc. (see Section 4.2.2 for the specific actions that would be implemented under APM AIR-1).

AECOM estimates that implementation of APM AIR-1 would increase the overall dust control efficiency from 68 percent associated with the general dust control measures, to approximately

80 percent (AECOM, 2012) based on control efficiency ratings identified by SCAQMD for various individual dust control measures (SCAQMD, 2007). However, similar to the discussion above in Section 4.2.1.1, it is not possible to calculate the exact combined control efficiency rating that would be associated with APM AIR-1. For example, the SCAQMD control efficiency rate for mud/dirt track-out on paved roads is up to 80 percent; however, mud and dirt track-out is only one of nine dust sources considered in the AP-42 paved road travel dust emission estimate (USEPA, 2011). Assuming that the nine dust sources contribute to paved road dust equally, the mud and dirt track-out measures identified in APM AIR-1 could control only up to 9 percent of the total paved road dust emissions. In addition, many of on-site control measures identified in APM AIR-1 already were considered with implementation of the general control measures assumed in the construction emission estimates provided in Tables 4.2-2 and 4.2-3. Although the control efficiency for the on-site dust control measures in APM AIR-1 could be more than 68 percent, a control efficiency of 80 percent has not been substantiated for on-site and off-site fugitive dust emissions.

However, even with the assumption that 80 percent of the on-site dust emissions could be controlled, the MDAQMD daily threshold would continue to be exceeded. With an 80 percent control, the 110 pounds of daily on-site fugitive dust emissions would be reduced to 67 pounds. Combined with an assumed 9 percent control efficiency for paved roadway dust, which would result in approximately 17 pounds of paved road dust, and the 7 pounds associated with exhaust emissions, the combined daily PM10 emissions would be 91 pounds, which would exceed the MDAQMD daily threshold.

Toxic Air Contaminants

MDAQMD requirements for health risk assessments categorize project sites by land use type and define the distance from the project site within which sensitive receptors must be considered for increased health risk. The worst case potential impact radius is associated with "Any industrial project" which requires that sensitive receptors within 1,000 feet of the project be considered. Though solar projects are not specifically identified in the categories, this worst case radius was assumed as the criterion for determining potential risks from exposure to DPM during construction. Using the associated definition of sensitive receptors, which include residences, schools, daycare centers, playgrounds, and medical facilities, it was determined that there would be little risk from exposure to DPM during construction because the closest sensitive receptors is located approximately 2.6 miles (13,200 feet) from the proposed solar plant site, and approximately 0.6 mile (3,200 feet) from a location along the gen-tie line south of I-10.

Operation and Maintenance

Criteria Pollutants

Table 4.2-4 and Table 4.2-5 show the estimated annual and maximum daily criteria pollutant emissions that would be generated each year during operation of the Project. These emission estimates do not include reductions associated with any emission controls. The annual and maximum daily emissions of all the criteria pollutants are below the respective NEPA *de minimis* levels and the MDAQMD thresholds. Impacts associated with operation and maintenance of the Project would not be expected to result in or contribute to an exceedance of a federal or state AAQS.

TABLE 4.2-4
PROPOSED ACTION ANNUAL OPERATION AND MAINTENANCE EMISSIONS

	Maximum Annual Emissions (tons/year)									
					PM10			PM2.5		
Source	**VOC**	**NOx**	**CO**	**SO_x**	**Exhaust**	**Dust**	**Total**	**Exhaust**	**Dust**	**Total**
On-Site Equipment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
On-Site Vehicles	<0.1	<0.1	<0.1	<0.1	<0.1	7.7	7.7	<0.1	0.8	0.8
Off-Site Vehicles	<0.1	0.1	0.4	<0.1	<0.1	0.2	0.2	<0.1	<0.1	<0.1
Total Emissions	<0.1	0.1	0.5	<0.1	<0.1	7.9	7.9	<0.1	0.8	0.8
de minimis level	100	100	100	100	---	---	100	---	---	100
MDAQMD Threshold	25	25	100	25	---	---	15	---	---	15
Exceeds Threshold?	No	No	No	No	---	---	No	---	---	No

SOURCE: AECOM, 2012.

TABLE 4.2-5
PROPOSED ACTION MAXIMUM DAILY OPERATION AND MAINTENANCE EMISSIONS

	Maximum Daily Emissions (pounds/day)									
					PM10			PM2.5		
Source	**VOC**	**NOx**	**CO**	**SOx**	**Exhaust**	**Dust**	**Total**	**Exhaust**	**Dust**	**Total**
On-Site Equipment	<0.1	0.8	0.6	<0.1	<0.1	<0.1	<0.1	<0.1	0.0	<0.1
On-Site Vehicles	<0.1	0.2	0.1	<0.1	<0.1	42.3	42.3	<0.1	4.2	4.2
Off-Site Vehicles	0.1	0.5	2.5	<0.1	0.1	1.0	1.1	<0.1	0.2	0.2
Total Emissions	0.2	1.5	3.2	<0.1	0.1	43.3	43.4	0.1	4.4	4.5
MDAQMD Threshold	137	137	548	137	---	---	82	---	---	82
Exceeds Threshold?	No	No	No	No	---	---	No	---	---	No

SOURCE: AECOM, 2012.

To reduce fugitive dust emissions during operation, the Applicant has proposed to implement APM AIR-2, which requires paving (or other road stabilizers) of the main on-site access roads, stabilization of all unpaved on-site access roads, on-site vehicle speed restrictions, covering of material transport vehicles, and minimization of the disturbance of desert pavement. Implementation of APM AIR-2 would reduce emissions of fugitive dust during operation, but it would not preclude the disturbance of desert pavement. Therefore, to reduce the impacts associated with the potential disruption of desert pavement, Mitigation Measure AQ-1 is recommended. It would require the application of non-toxic soil stabilizers to all areas where desert pavement has been disturbed. Implementation of Mitigation Measure AQ-1 would reduce the effects associated with the potential disturbance of desert pavement.

Toxic Air Contaminants

Due to the negligible amount of emissions that would be generated during operation and maintenance of the Project (see Tables 4.2-4 and 4.2-5), and because the closest sensitive receptors are located approximately 2.6 miles (13,200 feet) from the solar plant site, and approximately 0.6 mile (3,200 feet) from a location along the gen-tie line south of I-10, the risk from exposure to DPM during Project operation and maintenance would be negligible.

Decommissioning

At the end of the 30-year term of the ROW grant, Project operation and maintenance would cease and associated facilities would be decommissioned and dismantled, and the site would be restored over a period of approximately 24 months. Decommissioning activities could generate temporary air pollutant emissions similar to those that would occur during construction of the Project (see above).

4.2.4 Alternative 2: Reduced Acreage

4.2.4.1 Direct and Indirect Impacts

Construction

Criteria Pollutant Emissions

The annual criteria pollutant emissions that would be generated within the MDAB during each calendar year during the 24 months of construction for Alternative 2 have been estimated using the methodologies described in Section 4.2.1. For the purposes of this analysis, it is assumed that construction activities for Alternative 2 would begin in March 2013, and conclude in February 2015. As shown in Table 4.2-6, the annual emissions for 2013 and 2014 would be the same as for the Proposed Action; however, emissions for 2015 would be considerably less under Alternative 2 given that there would only be 2 months of active construction. Therefore, Alternative 2 would not result in or contribute to an exceedance of an annual AAQS.

Table 4.2-7 provides the estimated maximum daily criteria pollutant emissions that would be generated within the MDAB during construction of Alternative 2. The maximum daily emissions for CO, VOC, and SO_x would occur during Month 12, the maximum daily emissions for NO_x would occur during Month 6, and the maximum daily emissions of PM10 and PM2.5 would occur during Month 10. As shown in Table 4.2-7, the maximum daily emissions for VOC, NO_x, CO, SO_x, and PM2.5 would be below the respective MDAQMD thresholds. Therefore, it would not result in or contribute to an exceedance of an applicable daily or hourly AAQS. With regard to PM10, the estimated maximum daily emissions would exceed the MDAQMD threshold, indicating that PM10 emissions could result in an exceedance of the state PM10 24-hour AAQS. It should be noted that all of the maximum daily emissions would slightly decrease under Alternative 2 relative to the Proposed Action, with the exception of NO_x emissions, which would be the same.

TABLE 4.2-6
ALTERNATIVE 2 ANNUAL CONSTRUCTION EMISSIONS

Construction Year	Emission Source[a]	Annual Emissions (tons/year)					
		VOC	NO_x	CO	SO_x	PM10[b]	PM2.5[b]
Year 2013	Exhaust and on-site fugitive dust	1.5	9.9	10.1	<0.1	11.1	2.7
	Off-site dust	---	---	---	---	0.7	0.2
	Total	**1.5**	**9.9**	**10.1**	**<0.1**	**11.8**	**2.8**
Year 2014	Exhaust and on-site fugitive dust	1.7	9.1	15.0	<0.1	4.4	1.3
	Off-site dust	---	---	---	---	1.2	0.33
	Total	**1.7**	**9.1**	**15.0**	**<0.1**	**5.6**	**1.6**
Year 2015	Exhaust and on-site fugitive dust	0.2	0.9	2.0	<0.1	0.5	0.1
	Off-site dust	---	---	---	---	0.2	0.0
	Total	**0.2**	**0.9**	**2.0**	**<0.1**	**0.7**	**0.1**
de minimis level		100	100	100	100	100	100
MDAQMD Threshold		25	25	100	25	15	15
Exceeds Threshold?		No	No	No	No	No	No

NOTE: Total maximum daily emissions may include a slight rounding error.

[a] Exhaust and on-site fugitive dust emissions were estimated by AECOM (2012) and off-site fugitive dust emissions from vehicle travel on paved roads were estimated by ESA (2012).

[b] PM10 and PM2.5 emissions account for various on-site dust control measures resulting in a control efficiency of 68% relative to uncontrolled emissions; other pollutant emissions do not account for emissions control reductions.

SOURCES: AECOM, 2012; ESA, 2012.

TABLE 4.2-7
ALTERNATIVE 2 MAXIMUM DAILY CONSTRUCTION EMISSIONS

Emission Source[a]	Maximum Daily Emissions (pounds/day)					
	VOC	NOx	CO	SOx	PM10[b]	PM2.5[b]
Off-road Equipment Exhaust	11	84	40	0.0	4	3
Vehicle Exhaust	10	50	122	0.2	3	3
On-site Fugitive Dust	0	---	0	---	112	23
Paved Road Fugitive Dust	0	---	0	---	12	3
Total Maximum Daily Emissions	21	135	162	0.2	131	32
MDAQMD Threshold	137	137	548	137	82	82
Exceeds Threshold?	No	No	No	No	Yes	No

NOTE: Total maximum daily NO_x emissions include a slight rounding error.

[a] Exhaust and on-site fugitive dust emissions were estimated by AECOM (2012) and off-site fugitive dust emissions from vehicle travel on paved roads were estimated by ESA (2012).

[b] PM10 and PM2.5 emissions account for various on-site dust control measures resulting in a control efficiency of 68 percent relative to uncontrolled emissions; other pollutant emissions do not account for emissions control reductions.

SOURCES: AECOM, 2012; ESA, 2012.

The maximum daily PM10 emissions shown in Table 4.2-3 include both combustion exhaust emissions and fugitive dust. Fugitive dust sources would contribute approximately 112 pounds out of the 131 pounds of the total maximum daily PM10 emissions. To reduce fugitive dust emissions during construction, the Applicant has proposed to implement APM AIR-1 (see Section 4.2.2 for the specific measures that would be implemented under APM AIR-1). AECOM estimates that implementation of APM AIR-1 would increase the overall dust control efficiency from 68 percent associated with the general dust control measures, to approximately 80 percent (AECOM, 2012) based on control efficiency ratings identified by SCAQMD for various individual dust control measures (SCAQMD, 2007). However, it is not possible to calculate the exact combined control efficiency rating that would be associated with APM AIR-1 (see Sections 4.2.1.1 and 4.2.3.1). Although the control efficiency for the on-site dust control measures in APM AIR-1 could be more than 68 percent, a control efficiency of 80 percent has not been substantiated for on-site and off-site fugitive dust emissions.

However, even with the assumption that 80 percent of the on-site dust emissions could be controlled, the MDAQMD daily threshold would be exceeded. With an 80 percent control, the 112 pounds of on-site fugitive dust would be reduced to 70 pounds. Combined with an assumed 9 percent control efficiency for paved roadway dust, which would result in approximately 11 pounds of paved road dust, and the 7 pounds associated with exhaust emissions, the combined PM10 emissions would be 88 pounds, which would exceed the MDAQMD's daily threshold.

As under the Proposed Action, Alternative 2 NO_x emission levels would not reach the threshold established by MDAQMD.

Toxic Air Contaminants

The distances to the closest sensitive receptors (i.e., residences) under Alternative 2 would be the same as under the Proposed Action. Therefore, there would be little risk from residential exposure to DPM during construction of Alternative 2 and emissions of DPM from construction would not be expected to cause adverse health risks at any sensitive receptor in the vicinity of Alternative 2.

Operation and Maintenance

Criteria Pollutants

The annual and maximum daily criteria pollutant emissions that would be generated each year for operation of Alternative 2 would be approximately half of the emissions presented in Tables 4.2-4 and 4.2-5 for the Proposed Action. The annual and maximum daily emissions of all the criteria pollutants would be below the respective NEPA *de minimis* levels and the MDAQMD thresholds. Therefore, impacts associated with operation and maintenance of Alternative 2 would not be expected to result in or contribute to an exceedance of a federal or state AAQS.

As under the Proposed Action, Unit 1 under Alternative 2 would be constructed in an area with mature desert pavement. Therefore, to reduce the impacts associated with the potential disruption of desert pavement, implementation of Mitigation Measure AQ-1 would be recommended: it would require the application of non-toxic soil stabilizers to all areas where desert pavement has been disturbed. Implementation of Mitigation Measure AQ-1 would ensure that impacts under Alternative 2 associated with the potential disturbance of desert pavement would not be substantial.

Toxic Air Contaminants

Due to the negligible amount of emissions that would be generated during operation and maintenance of Alternative 2, and because the closest sensitive receptors are located far from the Project site, the risk from exposure to DPM during operation and maintenance of Alternative 2 would be negligible. Therefore, emissions of DPM from operation and maintenance of Alternative 2 would not cause adverse health risks at any sensitive receptor location.

Decommissioning

Decommissioning activities under Alternative 2 could generate temporary air pollutant emissions similar to those that would occur during construction of Alternative 2 (see above).

4.2.5 Alternative 3: Reconfigured Gen-tie/Access Road Routes

4.2.5.1 Central Route

Direct and Indirect Impacts

Criteria Pollutants

The Central Route would be a total of approximately 12.5 miles long. This is approximately 86 percent of the length of gen-tie that would be constructed under the Proposed Action. The daily activities that would be associated with construction of the Central Route would be expected to be the same as required for the proposed gen-tie line under the Proposed Action, so the total maximum daily emissions would be the same as those under the Proposed Action (see Tables 4.2-3 and 4.2-4). Therefore, as under the Proposed Action, the Central Route would contribute to an overall impact relative to maximum daily emission of PM10. However, given the shorter length, the Central Route would take approximately one fewer month to construct. For the purposes of this analysis, it is assumed that construction activities associated with the Proposed Action gen-tie line would occur during construction Month 6 (August 2013) through Month 13 (March 2014). Therefore, the total annual emissions associated with the Central Route would include one fewer month of transmission line construction work in 2014 compared to the Proposed Action. This would equal approximately 0.1 ton less CO, 0.1 ton less NO_x, and no measureable difference for the other criteria pollutants for year 2014 annual emissions compared to the emissions presented for the Proposed Action (see Table 4.2-2). The Central Route would not result in or contribute to an exceedance of an annual AAQS.

Toxic Air Contaminants

The distance to the closest sensitive receptor (i.e., a residence) to the portion of the Central Route that varies from the proposed gen-tie line route would be approximately 0.4 mile (2,100 feet).

This would be a shorter distance to a residence compared to the portion of the Proposed Action gen-tie line that varies from the Central Route, which would be approximately 0.8 mile (4,224 feet) from a residence. However, the Central Route would be farther than the MDAQMD's recommended 1,000-foot buffer distance for the assessment of TACs; therefore, there would be little risk from residential exposure to DPM during construction of the Central Route gen-tie line and emissions of DPM from construction of the Central Route would not be expected to cause adverse health risks at any sensitive receptor.

Air pollutant emissions and associated impacts related to the operation and maintenance of the Central Route would be identical to that of the Proposed Action gen-tie line as described in Section 4.2.3.1 above. Decommissioning activities associated with the Central Route could generate temporary air pollutant emissions similar to those that would occur during construction of the Central Route (see above).

4.2.5.2 Western Route

Direct and Indirect Impacts

Criteria Pollutants

The Western Route would be a total of approximately 15.5 miles long. This is approximately 10 percent longer than what would be constructed under the Proposed Action. It is expected that the daily activities associated with construction of the Western Route would be the same as required for the proposed gen-tie line, so the total maximum daily emissions would be the same as those under the Proposed Action (see Tables 4.2-3 and 4.2-4). Therefore, as under the Proposed Action, the Western Route would contribute to an overall impact relative to maximum daily emission of PM10. However, given the longer overall length, the Western Route would take approximately one additional month to construct compared to the Proposed Action. For the purposes of this analysis, it is assumed that construction activities associated with the proposed gen-tie line would occur during construction Month 6 (August 2013) through Month 13 (March 2014). Therefore, the total annual emissions associated with the Western Route would include one additional month of transmission line construction work in 2014 compared to the Proposed Action. This would equal approximately 0.1 additional ton of CO, 0.1 additional ton of NO_x, and no measureable difference for the other criteria pollutants for year 2014 annual emissions compared to the emissions presented for the Proposed Action (see Table 4.2-2). The Western Route would not result in or contribute to an exceedance of an annual AAQS.

Toxic Air Contaminants

The distance to the closest sensitive receptor (i.e., residences) to the portion of the Western Route that varies from the proposed gen-tie line would be approximately 0.5 mile (2,600 feet). This would be a shorter distance to a residence compared to the portion of the proposed gen-tie line that varies from the Western Route, which would be approximately 0.8 mile (4,224 feet) from a residence. However, the Western Route would be farther than the MDAQMD's recommended 1,000-foot buffer distance for the assessment of TACs; therefore, there would be little risk from residential exposure to DPM during construction of the Western Route and emissions of DPM from construction of the Western Route would not be expected to cause adverse health risks.

Air pollutant emissions and associated impacts related to the operation and maintenance of the Western Route would be identical to that of the Proposed Action gen-tie line and access road route as described in Section 4.2.3.1 above. Decommissioning of the Western Route could generate temporary air pollutant emissions similar to those that would occur during construction of the Western Route (see above).

4.2.6 Alternative 4: No Action Alternative

Under Alternative 4, none of the air resources-related impacts of the Project and no noticeable change from existing conditions would occur.

4.2.7 Cumulative Impacts

The geographic scope considered for potential cumulative impacts to regional air quality is the MDAB. Long-term Project operation and maintenance would not cause emissions that would exceed the MDAQMD thresholds (see Section 4.2.3.1, *Direct and Indirect Impacts*). In addition, Mitigation Measure AQ-1 would be implemented to reduce the long-term fugitive dust impacts associated with the potential disruption of desert pavement.

Project-related construction activities, as described in Section 4.2.3.1, *Direct and Indirect Impacts*, would result in short-term emissions of PM10 that would exceed the MDAQMD thresholds. Impacts would occur from short-term construction-related PM10 emissions and associated cumulative impacts when combined with the emissions-related impacts of the cumulative projects described in Section 4.1.5, *Cumulative Scenario Approach*, within the MDAB to the extent such projects would be constructed concurrently with the Project.

With regard to impacts on sensitive receptors, the geographic scope considered for potential cumulative impacts on sensitive receptors are projects located within approximately 1,000 feet of the Project that are also located within 1,000 feet of a sensitive receptor, such as a residence. The Project would be constructed in a remote area of Riverside County, where the closest sensitive receptor (i.e., residences) would be at least 0.6 mile (3,200 feet) from any component of the Project. The only project identified in Section 4.1.5, *Cumulative Scenario Approach*, that meets this criterion is the BSPP, which would be immediately south of the Project site and within 1,000 feet of a residence on its southern border. However, given that the residence on the BSPP southern border would be approximately 2.6 miles from the Project site, Project-related air pollutant concentrations at the residence would be negligible.

Construction of the Project would not cause a substantial impact related to the generation of odors from diesel equipment emissions because construction activities would be intermittent and spatially dispersed, and associated odors would dissipate quickly from the source. Projects in the cumulative scenario are not expected to cause diesel-related odors that would intermingle with those of the Project.

4.2.8 Mitigation Measures

AQ-1: The Applicant shall ensure that all areas where desert pavement has been disturbed during construction of the Project shall be applied with a non-toxic soil stabilizer prior to Project operation. The Applicant shall develop, for review and approval by the BLM, a plan that outlines the frequency of non-toxic soil stabilizer applications based on the specifications of the selected soil stabilizer.

4.2.9 Residual Impacts after Mitigation Incorporated

There would be a substantial residual Project-specific and cumulative impact related to short-term construction emissions of PM10 after mitigation measures have been incorporated because emissions would not be reduced to below MDAQMD thresholds.

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4.3 Biological Resources – Vegetation

4.3.1 Methodology for Analysis

This analysis of potential impacts of the Proposed Action and Alternatives to vegetation resources relies on a literature review, biological reconnaissance survey and coordination with appropriate permitting agencies including the USFWS and CDFG. A literature review was conducted to determine the federal and state-listed endangered, threatened, rare, and special-status plant species that have potential to occur within the Project vicinity. The literature review included a search of the CNDDB Electronic Inventory for the nine USGS 7.5' topographic quadrangles that surround the Project; as well as the federal and state publications. Literature related to BLM-listed Sensitive species in the California Desert District Office area (CDCA, NECO) and invasive weeds was reviewed. The following Project-specific documents also were reviewed:

1. Tetra Tech EC, Inc. and A. Karl. 2011a. Biological Resources Technical Report, McCoy Solar Energy Project, Riverside County, CA. Prepared for McCoy Solar, LLC, August 2011 (see Appendix C).

2. Tetra Tech EC, Inc. and A. Karl. 2011b. *Fall 2011 Plants and Supplemental Wildlife Survey Report, McCoy Solar Energy Project, Riverside County, CA*. Prepared for McCoy Solar, LLC, December 2011 (see Appendix C).

3. Tetra Tech EC, Inc. 2012a. McCoy Solar Energy Project Response to Data Request. (January 11, 2012).

This section analyzes potential impacts to vegetation resources from Project construction, operation and maintenance, and decommissioning. This analysis addresses potential impacts of the Project to special-status plant species, sensitive natural communities and other vegetation resources. Direct, indirect, and cumulative impacts are analyzed and quantified.

Impact analyses typically characterize effects to plant communities as temporary or permanent, with a permanent impact referring to areas that are paved or otherwise precluded from restoration to a pre-project state. In desert ecosystems the definition of permanent impacts must reflect the slow recovery rates of its plant communities. For the purposes of this analysis and following CDFG guidance, all ground disturbance activity is considered a permanent impact due to the long time period for natural revegetation to occur in the desert. Natural recovery rates from disturbance in desert ecosystems depend on the nature and severity of the impact. For example, creosote bushes can resprout a full canopy within 5 years after damage from heavy vehicle traffic (Gibson et al., 2004 as cited in CEC, 2010); however, for larger magnitude projects, severe damage involving vegetation removal and soil disturbance can take from 50 to 300 years for partial recovery with complete ecosystem recovery requiring over 3,000 years (Lovich and Bainbridge, 1999).

The analysis and environmental protection measures presented in this PA/FEIS were reviewed to provide consistency with approved mitigation measures that were presented in Appendices D through G of the NECO Plan/FEIS relating to desert tortoise, desert restoration, public education, and limitations on cumulative new surface disturbance (BLM, 2002). All practicable means to avoid or minimize environmental harm by the plan have been adopted.

4.3.2 Applicant Proposed Measures

The Applicant proposed the following APMs to address potential effects to vegetation, wetland, and riparian resources. These measures primarily were intended to avoid or reduce potential direct and indirect Project impacts to wildlife resources, specifically to desert tortoise and its habitat; however, they also would reduce Project impacts to vegetation resources identified in this chapter. APMs for Project impacts to vegetation, wetland, and riparian resources are listed below. The impact analysis assumes that the applicable APMs would be implemented as part of the Project.

BIO-2a. Biological Resources Mitigation and Monitoring Plan (BRMMP). The BRMMP will outline steps to implement the protection measures; document their implementation; and monitor their effectiveness. The BRMMP will identify the terms and conditions of any permits associated with the Project, including, but not limited to, the USFWS §7 Biological Opinion, CDFG §2081 Incidental Take Permit, and CDFG Streambed Alteration Agreement. The BRMMP will be submitted to the BLM and USFWS for approval prior to the start of ground disturbance.

BIO-2c. Worker Environmental Training. The Applicant will prepare and implement site-specific Worker Environmental Training to inform Project personnel about the biological constraints of the Project. The training will be included in the BRMMP and will be developed and presented by a qualified Project biologist prior to the commencement of construction activity. All Project personnel must attend the training. The training will include information regarding the sensitive biological resources, restrictions, protection measures, and individual responsibilities associated with the Project. Special emphasis will be placed on protection measures developed for the desert tortoise and the consequences of non-compliance. Written material will be provided to employees at orientation and participants will sign an attendance sheet documenting their participation.

BIO-2d. Construction-related Activities. Existing roads will be utilized wherever possible to avoid unnecessary impacts. New and existing roads that are planned for either construction or widening will not extend beyond the planned impact area and will minimize surface disturbance in native habitats, where practical. All vehicles passing or turning around will do so within the planned impact area or in previously disturbed areas. Along the linear facilities, the anticipated impact zones, including staging areas, equipment access, and disposal or temporary placement of spoils, will be delineated with stakes and/or flagging prior to construction to avoid natural resources, where possible. Outside the Project boundaries, personnel will utilize established roadways (paved or unpaved) for traveling to and from the Project Area, including for transmission line construction. No work in unfenced and uncleared habitat will occur except under the direct supervision of a BM. Cross-country vehicle and equipment use outside designated work areas will be prohibited. Best Management Practices will be employed to prevent loss of habitat due to erosion caused by Project-related impacts (i.e., grading or clearing for new roads). All detected erosion will be remedied within 2-days of discovery. Additionally, fueling of equipment will take place within existing paved roads and not within or adjacent to drainages or native desert habitats. Contractor equipment will be checked for leaks prior to operation and repaired as necessary. All vehicles and equipment will be in proper working condition to minimize the potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. The AB and BM will be informed of any hazardous spills within 24 hours. Hazardous spills will be immediately cleaned up and the contaminated soil will be properly disposed of at a licensed facility. Employees and contractors will look under vehicles and equipment for the presence of desert tortoises prior to movement. No equipment will be moved until the animal has left voluntarily or an AB removes it.

BIO-2n. Weed Management Plan. The Applicant will prepare and implement a Weed Management Plan to prevent the spread of existing weeds and the introduction of new weeds to the Project Area.

BIO-2o. Water Application for Dust Control. The Applicant will ensure water is applied to the construction area, dirt roads, trenches, spoil piles, and other areas where ground disturbance has taken place to minimize dust emissions and topsoil erosion. A BM will patrol these areas to ensure water does not pool for long periods of time and potentially attract desert tortoises, common ravens, and other wildlife.

BIO-2p. Cleanup and Restoration; Revegetation Plan. The Applicant will ensure that all unused material and equipment will be removed upon completion of construction activities or maintenance activities conducted outside the permanently fenced sites (this includes non-emergency and emergency repairs). Upon completion, all construction equipment and refuse, including, but not limited to wrapping material, cables, cords, wire, boxes, rope, broken equipment parts, twine, strapping, buckets, metal or plastic containers will be removed from the site and disposed of properly. Any unused or leftover hazardous products will be properly disposed of off-site. The Applicant will prepare and implement a Revegetation Plan to restore temporarily disturbed areas.

BIO-4. Desert Tortoise Compensation. To fully mitigate for habitat loss and potential take of desert tortoise, the Applicant will provide compensatory mitigation at a 1:1 ratio for impacts to all Category 3 desert tortoise habitat in accordance with the NECO Plan (BLM, 2002). (Approximately 4,500 acres of Category 3 habitat would be disturbed). This excludes 38 acres of sand dunes, agricultural areas, and areas that are currently developed or disturbed along the access road. Acreage of disturbance was based on the best available Project plans and would be adjusted, based on pre- and post-construction aerial photography, to reflect the final Project disturbance footprint. Because the construction of Unit 1, Unit 2, and the linear facilities would be phased, compensation obligations (e.g., security deposits and the actual funding or acquisition of mitigation land) should be apportioned as follows:

a. Unit 1: 2,259 acres at a 1:1 ratio;
b. Unit 2: 2,178 acres at a 1:1 ratio; and
c. Linear facilities: 106 acres at a 1:1 ratio.

The following qualitative criteria would be used to select compensation lands to ensure that they provide mitigation for the incidental take of desert tortoises:

a. Compensation lands should be part of a larger block of lands that are either already protected or planned for protection, or feasibly could be protected by a public resource agency or a private biological reserve organization.

b. Parcels should provide habitat that is as good as or better than the habitat being impacted by the Project. Preferably, the lands would comprise sufficiently good habitat that they are either currently occupied or could be occupied by the desert tortoise once they are protected from anthropogenic impacts and/or otherwise enhanced.

c. Parcels should not be subject to such intensive recreational, grazing, or other uses that recovery is rendered unlikely or lengthy. Nor should those invasive species that are likely to jeopardize habitat recovery (e.g., Sahara mustard [*Brassica tournefortii*]) be present in uncontrollable numbers, either on or immediately adjacent to the parcels under consideration.

d. The parcels should be connected to occupied desert tortoise habitat or in sufficiently close proximity to known occupied tortoise habitat such that an unencumbered genetic flow is possible. Preferably, the existing populations of desert tortoise on these lands would represent populations that are stable, recovering, or likely to recover.

e. The parcels should be consistent with the goals, objectives, and recovery actions of an accepted recovery strategy (e.g., recovery plan) for the desert tortoise if possible.

BIO-5. Protection Measures during Decommissioning/Closure. Project Decommissioning: The planned operating life of the Project is 30 years. In the event the Project permanently shuts down, and no other project will occupy the same industrial space, the Applicant will prepare and implement a Decommissioning Plan to ensure that the environment is protected during the decommissioning phase. Prior to decommissioning, a plan will be finalized and approved by the BLM. The Applicant shall retain an AB for the decommissioning phase of the Project to ensure that all environmental protection measures are implemented. The Applicant will submit the names and qualifications of all proposed biologists to the USFWS and BLM for review and approval at least 30 days prior to decommissioning activities and prior to initiation of any tortoise handling. Decommissioning activities will not begin until the ABs are approved by the aforementioned agencies.

An additional APM is relevant to this analysis, **HYDRO-1**, *Impacts to State-jurisdictional Waters*, which is discussed in Section 4.20, *Water Resources*.

4.3.3 Alternative 1: Proposed Action

4.3.3.1 Direct and Indirect Impacts

Potential direct impacts on vegetation include disruption, trampling, or removal of rooted vegetation resulting in a reduction in the total acres of native vegetation and actions that unequivocally cause a reduction of total numbers of plants and/or reduction or loss of total area, diversity, vigor, structure, or function of vegetative habitat. Direct impacts also could include decreased plant vigor or health from reduced water availability or dust accumulation on photosynthetic surfaces.

Indirect impacts can occur later in time or be farther removed in distance while still being reasonably foreseeable and related to the project. Potential indirect impacts of the Project include the introduction of invasive species by various vectors or conditions that compete with native species and can result in habitat degradation.

Construction

Native Vegetation Communities

Sonoran Creosote Bush Scrub is the dominant native vegetation community on the solar plant site and also occurs on portions of project linear corridors. It is estimated that Unit 1 supports approximately 2,199 acres, Unit 2 supports approximately 2,073 acres, and the off-site linear corridors support approximately 100 acres of creosote scrub habitat (a total of 4,372 acres) that would be permanently affected by the Project. Direct impacts to creosote bush scrub include the permanent loss of native plant communities and fragmentation from adjacent or nearby native vegetation communities. Other temporary indirect impacts from the Proposed Action could occur to surrounding vegetation communities from grading activities disturbing soils and creating air-born, fugitive dust, which may disrupt photosynthesis and other metabolic processes, or sedimentation to or erosion of vegetated areas. In addition to the implementation of APM BIO-2p, which includes a Revegetation Plan, this impact would be reduced through the implementation of Mitigation Measures VEG-1 through VEG-10, which identify measures to protect special-status plants and require that a Special-Status Plant Species Impact Avoidance and Mitigation Plan be prepared to compensate for the loss of creosote desert scrub, and avoid, reduce, or mitigate impacts to native vegetation communities.

Stabilized and Partially Stabilized Dunes and Sand Transport Corridor

The western portion of the gen-tie line south near I-10 is exclusively within stabilized and partially stabilized dune habitat and within a regional sand transport corridor. Construction of the gen-tie support towers, gen-tie maintenance road and spur roads, and the 230 kV switchyard located near the CRS would cause direct, permanent impacts to sand dunes within the Project footprint. The 240-foot wide study corridor includes 38.0 acres of dune habitat. Half of this area (19 acres) is subject to permanent impacts and the remaining area (19 acres) is subject to temporary impacts. Temporary impacts to dune habitats could occur in association with string pulling sites, and equipment and vehicle staging areas located south of I-10. Because constructed roads would be built at-grade, linear facilities outside the solar plant boundary would have little direct impact on the sand transport corridor other than the temporary and permanent loss of habitat. Indirect impacts on stabilized and partially stabilized sand dunes include facilitating the spread of invasive weeds, including Sahara mustard. Sahara mustard increases dune stabilization, and therefore degrades dune habitat. Proposed activities at the solar plant site would not impact dune habitat; however, the gen-tie corridor traverses dune habitats. APM BIO-2n provides for preparation of a Weed Management Plan to address the management of invasive weeds.

Additional requirements for this plan are provided in Mitigation Measure VEG-9. This plan would reduce the potential for the introduction of invasive species during Project construction.

Ephemeral Drainages and Sensitive Plant Communities

Direct impacts include permanent loss of hydrological, geomorphic, and biological functions and values in up to 165.2 acres of vegetated ephemeral streams and unvegetated ephemeral dry washes, and 4.2 acres of desert dry wash woodland on the Project site, gen-tie line and distribution line (Figure 3.3-3; Table 4.3-4). Indirect impacts include potential alterations to hydrological connectivity to areas downstream of the Project site, including off-site desert dry wash woodland, vegetated ephemeral streams and unvegetated ephemeral dry wash. Other indirect impacts include head-cutting on drainages upslope and erosion/sedimentation downslope. Without implementation of protective measures, dust generated during construction could directly adversely affect off-site native vegetation communities immediately adjacent to the Project. Similarly, indirect impacts could occur to desert dry wash woodland habitat in McCoy Wash, downstream of the Project site as a result of construction activities due to an increase in the rate, volume, and sediment load of storm water runoff. Direct impacts on desert dry wash woodland located adjacent to and downstream from the solar plant site could introduce invasive plant species into these areas. While ephemeral drainages on the site would be subject to disturbance, the Project would be designed to maintain predevelopment hydraulic conditions in the natural watercourses and minimize the placement of solar arrays in large, established channels. This would minimize the alteration of hydrologic conditions downstream from the Project. In addition to APM HYDRO-1, the implementation of Mitigation Measures VEG-7, VEG-8, VEG-10, and VEG-11 would avoid, or reduce some of the direct and indirect impacts to ephemeral drainages (i.e., waters of the state).

Special-Status Plants - Direct Impacts

No federal or state-listed plant species occur within the study area, and so none would be affected. Permanent direct impacts would occur to six non-listed special-status plant species that are documented in the study area. One of these, Harwood's eriastrum (*Eriastrum harwoodii*), is a BLM Sensitive species. These special-status plant species identified in Table 4.3-2, including all documented populations of desert unicorn plant (*Probocidea altheaifolia*), Harwood's milk-vetch (*Astragalus insularis* var. I), Las Animas colubrina (*Colubrinia*), ribbed cryptantha (*Cryptantha costata*), Harwood's eriastrum, and Utah milkvine (*Cynanchum utahense*) on the solar plant site, would be directly and permanently affected through direct removal during Project construction. Additionally, populations of desert unicorn plant, Harwood's milk-vetch, ribbed cryptantha, Harwood's eriastrum, and Utah milkvine that occur on the gen-tie alignment and could be permanently or temporarily affected during construction of support towers, the gen-tie maintenance road and spur roads, and the 230 kV switchyard.

Direct impacts to special-status plants include the loss of plants during site grading, accidental crushing of plants during construction including during site clearing and grubbing, and from vehicle staging atop plant populations. There is an additional chance that new special-status plant populations could be located on the Project site or linear corridors prior to construction. If present, these populations also would be directly affected. The implementation of Mitigation Measure VEG-7, which would avoid and minimize special-status plant impacts, and Mitigation

Measure VEG-10, which requires a Special-Status Plant Species Impact Avoidance and Mitigation Plan that includes preconstruction surveys and salvage activities for special-status plants and cacti, would reduce these impacts.

Special-Status Plants - Indirect Impacts

Indirect impacts to special-status plants may occur within and outside the Project disturbance area during and following construction. Potential indirect effects to special-status plants include: facilitating the introduction and spread of non-native invasive plant species; altering surface hydrology in downstream off-site areas and the geomorphic processes that support rare plants and their habitat (e.g., disrupted aeolian and fluvial sand transport processes from obstructions and diversions); fragmenting plant populations and potentially disrupting gene flow; disruption of pollinators; increased risk of fire; disturbance of the structure and ecological functioning of biological soil crusts, which may affect seed germination, reduce soil nutrition, and render the soil vulnerable to water and wind erosion; herbicide and other chemical drift; and disruption of photosynthesis and other metabolic processes from fugitive dust during Project construction and operation.

The impacts of stressors (such as the spread of invasive plants, hydrologic and geomorphic alterations, etc.) on special-status plants are well-documented in the literature. The benefits of restoration and enhancement to rare plant populations have been demonstrated in a variety of projects conducted by public and private land managers, including BLM, NPS, The Nature Conservancy, USFS, California State Parks, and the CNPS. The application of APM BIO-2n (*Weed Management Plan*) and the implementation of Mitigation Measure VEG-9, which provides further requirements for the Invasive Weed Management Plan (IWMP) would somewhat reduce the potential for the introduction of invasive species during Project construction.

Cacti, Yucca, and Native Trees

Several species of non-listed cactus and native desert trees occur within the Study Area including California barrel cactus (*Ferocactus cylindraceus* var. *cylindraceus*), cottontop cactus (*Echinocactus polycephalus* var. *polycephalus*), common fishhook cactus (*Mammillaria tetrancistra*), beavertail cactus (*Opuntia basilaris*), silver cholla (*Cylindropuntia echinocarpa*), pencil cholla (*Cylindropuntia ramosissima*), blue palo verde (*Parkinsonia florida* [=*Cercidium floridium* ssp. *floridium*]), ironwood (*Olneya tesota*), mesquite (*Prosopis glandulosa*), and ocotillo (*Fouquieria splendens* ssp. *splendens*) (Tetra Tech EC and Karl 2011a; 2011b). Smoketree (*Psorothamnus spinosum*) was also documented immediately adjacent to the solar plant site. It is anticipated that all cacti and native trees in the roughly 4,605-acre Project disturbance area would be directly affected by site development. The implementation of Mitigation Measure VEG-7, which would avoid and minimize rare plant impacts, and Mitigation Measure VEG-10, which requires a Special-Status Plant Species Impact Avoidance and Mitigation Plan that includes preconstruction surveys and salvage activities for special-status plants and cacti, would reduce these impacts.

Operation and Maintenance

Invasive Non-Native Plants

The maintenance of access roads both within and outside the Project site boundary has the potential to introduce invasive plant species into disturbed areas and facilitate the spread of invasive weeds. Vehicles and crews inadvertently could track in clinging seeds and/or parts of invasive weeds, thus facilitating their spread. The application of APM BIO-2n and implementation of Mitigation Measure VEG-9 would reduce these impacts.

Decommissioning

Decommissioning is anticipated to only directly affect areas that were previously disturbed during installation of the facilities. Thus, the direct removal of native vegetation communities and special-status plants is not anticipated for decommissioning activities. Potential direct and indirect effects to special-status plant populations include the introduction of fugitive dust on exposed topsoil and colonization of the Project site by invasive species during and following site decommissioning.

A summary of the overall acreages of impacts associated with the Proposed Action and Alternatives is provided in Table 4.3-1. Acreages calculated for impacts were based on the best information available at the time of publication of the PA/FEIS for permanent disturbance areas. These acreages are based on information provided by the Applicant regarding construction of each Project component. Alternative 3, the Central Route and Western Route gen-tie line and access road alternatives, do not include the solar plant site or the distribution line. This is indicated by a dash ("–") in the solar plant site and distribution line rows of Table 4.3-1. Similarly, Alternative 2 does not include a gen-tie line and access road component, as indicated by the "–" in the gen-tie line disturbance rows of Table 4.3-1.

Tables 4.3-2 through 4.3-4 summarize the direct impacts for the Proposed Action and each alternative on special-status plant species, sensitive natural communities, and riparian habitat and state-jurisdictional resources, respectively, as described in more detail below.

4.3.4 Alternative 2: Reduced Acreage

4.3.4.1 Direct and Indirect Impacts

The direct and indirect impacts of the Reduced Acreage Alternative on vegetation resources would be similar in nature, though roughly half the magnitude of the Proposed Action. The types of impacts that would occur under Alternative 2 similarly would result in the direct and permanent loss of all special-status plants and vegetation communities within the disturbance footprint, and indirect impacts to vegetation resources would be similar to those discussed for the Project.

Anticipated direct impacts to special-status plants of Alternative 2 are presented in Table 4.3-2. Under this alternative, direct impacts to Harwood's milk-vetch, Ribbed cryptantha, and Harwood's eriastrum would be slightly reduced compared to Alternative 1, and direct impacts to Abram's spurge, Las Animas colubrina, Utah milkvine, and desert unicorn plant would be greatly

TABLE 4.3-1
COMPARISON OF ACTION ALTERNATIVES RELATIVE TO VEGETATION COMMUNITY IMPACTS

Vegetation Communities by Project Component	Impact within Project Area (acres)			
	Alternative 1	Alternative 2	Alternative 3 Central Route[b]	Alternative 3 Western Route[c]
Solar Plant Site				
Desert Dry Wash Woodland (Blue Palo Verde-Ironwood)	1.5	0.0	–	–
Vegetated Ephemeral Channels (sparse trees)	40.9	2.8	–	–
Vegetated Ephemeral Channels (no trees)	97.7	47.3	–	–
Unvegetated Drainages	25.3	10.2	–	–
Sonoran Creosote Bush Scrub	4,271.6	2,198.7	–	–
Gen-Tie Line Disturbance				
Desert Dry Wash Woodland (Blue Palo Verde-Ironwood)	1.8	–[a]	1.2	10.3
Mesquite Bosque	0.5	–	0.4	0.5
Creosote - Big Galleta Grass	0.0	–	0.0	0.4
Vegetated Ephemeral Channels (no trees)	0.8	–	0.2	0.0
Unvegetated Drainages	0.5	–	0.3	0.0
Sonoran Creosote Bush Scrub	96.4	–	24.8	134.0
Stabilized and Partially Stabilized Desert Dunes	38.0	–	38.0	38.0
Distribution Line				
Desert Dry Wash Woodland (Blue Palo Verde-Ironwood)	0.9	0.9	–	–
Sonoran Creosote Bush Scrub	4.1	4.1	–	–
Agricultural Land	2.3	2.3	–	–
Total Disturbance Area	**4,582.3**	**2,266.3** [a]	**69.9**	**183.2**

NOTES:

a If selected, Alternative 2 could be supported by either the proposed Eastern Route or the alternative Central Route; therefore, gen-tie line disturbance areas are not included.

b These acreages presume that the Central Route would traverse an approximately 2-mile portion of the adjacent BSPP site that has already been graded and therefore does not contain vegetation.

c Impacts to vegetation communities along the Western Route were not mapped at the same level of detail as the Eastern and Central Routes. Because it is not known exactly where along the alignment disturbance would occur (e.g., where poles would be located), to conservatively estimate impacts to vegetation communities, the impact area is presented for the entire gen-tie line alignment at the ROW width of approximately 100 feet.

SOURCE: Tetra Tech EC, Inc. and A. Karl, 2011a, 2011b; Tetra Tech EC, Inc. 2012a, 2012b

reduced. A majority the populations for the latter four species occur in Unit 2, which would not be impacted under Alternative 2. Indirect impacts to special-status plants from the potential for spread of invasive weeds would be reduced under Alternative 2 in direct proportion to the reduced size of the alternative. The implementation of Mitigation Measures VEG-7, VEG-8, VEG-10, and VEG-11 would reduce direct impacts to special-status plants while APM BIO-2n and the implementation of Mitigation Measure VEG-9 would reduce the potential indirect impacts related to the introduction of invasive species during Project construction, operation and maintenance, and decommissioning.

TABLE 4.3-2
OVERALL SUMMARY OF IMPACTS ON SPECIAL-STATUS PLANT SPECIES

Species	Estimated Number of Individual Impacted Plants[a]			
	Alternative 1	Alternative 2[b]	Alternative 3 Central Route[c]	Alternative 3 Western Route[c]
Harwood's milk-vetch	>181	>181	7	0
Abram's spurge	3,996	1,125	0	0
Las Animas colubrina	167	1	0	1
Ribbed cryptantha	>13,911	> 13,911	0	0
Utah milkvine	>2,407	>137	>50	4
California ditaxis	0	0	0	0
Harwood's eriastrum (= Harwood's phlox)	30	30	0	0
Desert unicorn plant	>743	>286	0	0

NOTES:

[a] Note that plant impact numbers are for individual plants located within the disturbance footprint
[b] Includes occurrences on solar plant site Unit 1, Alternative 1 gen-tie alignment, and distribution line
[c] Includes only plants identified on portions of Alternative 3 that are unique to that alignment

SOURCE: Tetra Tech EC, Inc. and Karl, 2011a, 2011b

TABLE 4.3-3
OVERALL SUMMARY OF IMPACTS ON SENSITIVE VEGETATION COMMUNITIES

Vegetation Community	Estimated Impact Area (acres)			
	Alternative 1	Alternative 2	Alternative 3 Central Route	Alternative 3 Western Route
Desert Dry Wash Woodland (Blue Palo Verde-Ironwood Woodland Alliance)	4.2	0.9[a]	1.2	10.3
Creosote Bush-Big Galleta Grass Association	0.0	0.0	0.0	0.4
Sand Dunes[b]	19 (19)	0.0	19 (19)	19 (19)

NOTES:

[a] The 0.9-acre impact area includes impacts for the solar plant (0.0 acre) and distribution line (0.9 acre); if selected, Alternative 2 could be supported by either the proposed Eastern Route or the alternative Central Route.
[b] Impacts to sand dunes are equivalent for all gen-tie alternatives and include 19 acres of permanent impacts and 19 acres of temporary impacts

SOURCE: Tetra Tech EC, Inc. and Karl, 2011a, 2011b; Tetra Tech EC, Inc. 2012a, 2012b

TABLE 4.3-4
SUMMARY OF IMPACTS ON RIPARIAN HABITAT AND STATE-JURISDICTIONAL RESOURCES

	Impacts by Project Alternative (acres)			
Species	**Alternative 1**	**Alternative 2[a]**	**Alternative 3 Central Route**	**Alternative 3 Western Route**
Desert Dry Wash Woodland (Blue Palo Verde-Ironwood Woodland Alliance)	4.2	0.9	1.2	10.3
Mesquite Bosque	0.5	0.0	0.4	0.5
Vegetated Ephemeral Channels (sparse trees)	40.9	2.8	0.0	0.0
Vegetated Ephemeral Channels (no trees)	98.5	47.3	0.2	0.0
Unvegetated (approximately less than or equal to 5% cover)	25.8	10.2	0.3	0.0
Total Jurisdictional Area (acres)	169.9	61.2	2.1	10.8

NOTES:

[a] If selected, Alternative 2 could be supported by either the proposed Eastern Route or the alternative Central Route; therefore, gen-tie line disturbance areas are not included.

SOURCE: Tetra Tech EC, Inc. and Karl, 2011a, 2011b; Tetra Tech EC, Inc. 2012a, 2012b

Botanical surveys of the Project site quantified non-listed cacti and trees on the Project site, but their distribution was not mapped. Therefore, the species and number of individual cacti that would be impacted under Alternative 2 are not known. Similarly, the distribution of individual native desert trees was not identified on the Project site; however, habitats that support trees were characterized during focused surveys. Desert dry wash woodland habitat (Blue Palo Verde-Ironwood Woodland Alliance) was exclusively mapped within Unit 2 and does not occur in the Alternative 2 Project area (Table 3.3-1) (Tetra Tech EC and Karl, 2011a; 2011b). Other native desert trees were described within vegetated ephemeral swales on the Project site, for which 2.8 acres of vegetated ephemeral channel (wash-dependent vegetation with sparsely scattered trees) habitat would be impacted on the solar plant site under Alternative 2 (Table 4.3-1). This compares to 40.9 acres of similar habitat that would be impacted under Alternative 1. The implementation of Mitigation Measures VEG-7, VEG-8, VEG-10, and VEG-11, which require a Special-Status Plant Species Impact Avoidance and Mitigation Plan that includes preconstruction surveys and salvage activities for special-status plants and cacti, would reduce these impacts.

Impacts to vegetation communities under Alternative 2 are presented in Tables 4.3-1 and 4.3-3. Under Alternative 2, the project would affect 2,264 acres of natural habitat (excludes 2.3 acres of agricultural land). Creosote bush scrub is the dominant vegetation community, representing 2,202.8 acres of the impact area under Alternative 2. The reduced direct impacts to native vegetation communities under Alternative 2 are directly proportional to the reduced size of the alternative compared to the Proposed Action. The implementation of Mitigation Measure VEG-10 would reduce impacts to native vegetation communities.

Potential indirect impacts to native vegetation communities would be similar to those discussed for Alternative 1. The impact of dust generated by the Project on native vegetation would be somewhat lessened by the implementation of APMs AIR-1 and AIR-2 (Air Resources).

Most of the ephemeral drainages that occur on the Project site are concentrated in the more westerly situated Unit 2, with relatively fewer riparian features in Unit 1 (Table 3.3-1). As a result, Alternative 2 would have substantially fewer impacts on ephemeral drainages and sensitive riparian vegetation communities than Alternative 1. Under Alternative 2, impacts to desert dry wash woodlands and vegetated and unvegetated ephemeral swales would be 61.2 acres (Table 4.3-4). The overall magnitude of the impact would be reduced through APM HYDRO-1 and the implementation of Mitigation Measures VEG-7, VEG-8, VEG-10, and VEG-11.

No federally protected wetlands occur on the Project site. Thus, Alternative 2 would not impact federally protected wetlands through direct removal, filling, hydrological interruption, or other means, as defined by CWA §404.

Alternative 2 would not conflict with any local policies or ordinances protecting biological resources.

4.3.5 Alternative 3: Reconfigured Gen-tie/Access Road Routes

4.3.5.1 Central Route

Direct and Indirect Impacts

The Central Route would affect a total of 69.9 acres of natural habitat (Table 4.3-1) including 2.1 acres of riparian habitat (Table 4.3-4), compared to 3.1 acres of riparian habitat compared to the Eastern Route (Table 4.3-1). This value includes 1.2 acres of desert dry wash woodland (Figure 4.3-3). Most of the desert dry wash woodland habitat in the portion that differs from Alternative 1 includes lines that would span sensitive areas without permanent disturbance; however, an all-season access road that parallels the gen-tie line would cause permanent impacts. Direct impacts of these differing areas are generally similar to those under Alternative 1 and include permanent loss of hydrological, geomorphic, and biological functions and values in impacted riparian areas, principally associated with new roads. Direct and indirect impacts to riparian habitat associated with the Central Route would be incrementally smaller than those under Alternative 1 prior to mitigation, but would be somewhat lessened through APM HYDRO-1 and the implementation of Mitigation Measures VEG-7, VEG-8, VEG-10, and VEG-11.

Direct impacts to special-status plants would be incrementally greater under the Central Route compared to the comparable portion of Alternative 1, with slightly greater impacts to Harwood's milk-vetch (seven plants for the Central Route and three for Alternative 1) and Utah milkvine (about 50 plants for the Central Route and none for Alternative 1) (Table 4.3-2). The Central Route would not impact desert unicorn plant for which one plant occurs on the comparable portion of Alternative 1. Direct impacts to other special-status plants would be largely the same as

Alternative 1, and reduced following the implementation of Mitigation Measures VEG-7, VEG-8, VEG-10, and VEG-11.

4.3.5.2 Western Route

Direct and Indirect Impacts

The Western Route would affect a total of 183.2 acres of natural habitat (Table 4.3-1) including 10.3 acres of riparian habitat (desert dry wash woodland) (Table 4.3-4), compared to 3.1 acres of riparian habitat compared to the Eastern Route (Table 4.3-1). Most of the sensitive habitat would be spanned by the gen-tie line without permanent disturbance to the habitat beneath. However, each pole would require an individual spur road to provide all-season access (road locations are not specifically defined). Direct impacts include permanent loss of hydrological, geomorphic, and biological functions and values in impacted riparian areas, principally associated with the creation of permanent roads. The riparian impacts associated with the Western Route would be greater than those under Alternative 1 prior to mitigation, but would be lessened somewhat through APM HYDRO-1 and the implementation of Mitigation Measures VEG-7, VEG-8, VEG-10, and VEG-11.

Direct impacts to special-status plants would be comparable between the Western Route and Alternative 1. The Western Route would have fewer impacts to Harwood’s milk-vetch (no plants for the Western Route and three for Alternative 1) and desert unicorn plant (no plants for the Western Route and one for Alternative 1), and greater impacts to Utah milkvine (four plants for the Western Route and none for Alternative 1) and Las Animas colubrina (one plant for the Western Route and none for Alternative 1) (Table 4.3-2). Direct impacts to other special-status plants would be largely the same as Alternative 1.

4.3.6 Alternative 4: No Action Alternative

Under this alternative, the Project would not be approved by the BLM. As a result, lands administered by BLM would continue to be managed consistent with current land use designations in the CDCA Plan. The MSEP site is within the Riverside East SEZ as designated in the Solar PEIS ROD. The Solar PEIS ROD amended the CDCA Plan to identify lands within the Riverside East SEZ as suitable for solar energy development; therefore, it is very likely that commercial-scale solar development would be promoted within the ROW application area even if this No Action Alternative were selected. All other uses allowable on CDCA MUC-L lands and on the affected private lands would continue to be available. However, because the configuration, nature, location, resource intensiveness, and other factors related to any future solar energy project are unspecified and uncertain, the BLM cannot predict the potential consequences to wildlife resources that might result from such development, and so finds that particular impacts are too speculative to evaluate meaningfully in this PA/FEIS.

4.3.7 Cumulative Impacts

4.3.7.1 Geographic Scope

This cumulative impact analysis evaluates the effects of existing and reasonably foreseeable future projects that threaten plant communities within the Palo Verde Valley. The Proposed Action would be located mostly within the Palo Verde Valley with a portion in the lower Chuckwalla Valley. These areas, shown in Figure 4.3-1, were selected as the geographic scope for the cumulative effects analysis for sensitive vegetation communities (i.e., desert dry wash woodland) and jurisdictional resources and collectively are referred to as the "cumulative analysis area" in this subsection. This scale was selected for the analysis of cumulative effects to better understand the contribution of local projects to effects on sensitive resources near the Project site.

4.3.7.2 Temporal Scope

In addition to construction-related impacts, the Project would have ongoing operational impacts to biological resources. Therefore the temporal scope of the cumulative effects analysis for sensitive vegetation communities includes the construction, operation and maintenance, and decommissioning phases of the Project.

4.3.7.3 Regional Overview

This overview of regional impacts is followed by a more detailed discussion of the effects of past, present, and reasonably foreseeable future projects to biological resources in the Project vicinity.

The California Desert remained a desolate area for the first few decades of the 20th century. Disturbance was more or less restricted to highways, railroad, and utility corridors, scattered mining, and sheep grazing. In the 1940s, several large military reservations were created for military training, testing, and staging areas. The deserts of eastern Riverside County make up 40 percent of the County's land area but less than 1 percent of its population. Outside of the small urban-agricultural center of Blythe, near the Colorado River and Arizona border, there are only a few scattered, small residential and agricultural areas between Indio (to the west) and Blythe; most of the lands are administered by the BLM.

Populations of many of the desert's sensitive plants were considered relatively stable until recently, as the push for renewable energy development has placed some populations at risk. Renewable energy developers have submitted project applications that would collectively cover more than one million acres of the region. Development of these projects could contribute to habitat loss and fragmentation and barriers to gene flow. Although these Projects have or would undergo environmental permitting and analysis under NEPA, CEQA, and/or other federal and state laws to evaluate project-level environmental impacts, even after mitigation of project-level impacts, these projects could collectively contribute to impacts on sensitive resources. Because the Project would largely work within existing contours and does not require large scale vegetation removal or grading, several non-listed special-status plant species and associated vegetation communities that occur on-site are expected to persist following site decommissioning.

Thus, the Project is expected to displace a portion of on-site rare plant populations, but substantial recovery of vegetation resources is expected following site decommissioning.

In the areas identified for renewable energy development in eastern Riverside County, including Palo Verde Valley and Chuckwalla Valley, some of the many sensitive vegetation resources at risk include desert washes and desert dry wash woodland; native, slow-growing vegetation; and special-status plants.

The introduction of nonnative plant species has also contributed to habitat degradation, population declines, and range contractions for many special-status plant species (Boarman, 2002). Combined with the effects of historical grazing and military training, and fragmentation of habitat from highway and aqueduct construction, the proposed wind and solar energy projects have the potential to further reduce and degrade native plant populations. In the context of this large-scale habitat loss, the Project would contribute to the cumulative loss and degradation of habitat for desert plants in the cumulative analysis area.

Details of the vegetation resources within the cumulative analysis area are summarized here and provided more fully in Section 3.3. The Palo Verde Valley and Chuckwalla Valley are located within the Sonoran Desert, which contains a diverse range of vegetation communities including desert scrub, desert wash, and sand dunes. These valleys also include numerous drainages and areas relatively devoid of native vegetation including developed areas, paved roads, highways, access roads, and other disturbed areas. Invasive and noxious weed species are noted within the cumulative analysis area and continue to be an ongoing management issue in the Sonoran Desert. The cumulative analysis area supports habitat for, and populations of, numerous special-status plant species, as described in Section 3.3.

Land use in the cumulative analysis area historically has been altered by human activities, resulting in conversion of undeveloped land and habitat loss, fragmentation, and degradation. Reasonably foreseeable future projects that could impact biological resources in the cumulative analysis area characterize regional development trends. Ongoing development in the area is dominated by renewable energy development. Major renewable projects require extensive access roads and new transmission lines to tie into the existing electrical grid system.

Other projects in the cumulative analysis area include several transmission lines and non-renewable energy development, as well as residential and commercial development. In addition to short-term construction impacts, the Project would have ongoing operational impacts on biological resources. Therefore, all projects that might contribute impacts throughout the temporal scope of the cumulative analysis are considered for this analysis. This would include non-renewable energy, transmission lines, wind power, and solar power projects.

Native Vegetation Communities

The development of numerous large-scale projects, such other solar generation facilities identified in Tables 4.1-3 and 4.1-4, would result in the permanent conversion of desert habitat to industrial and commercial uses. Table 4.3-5 presents the total acreage of vegetation communities

TABLE 4.3-5
SUMMARY OF CUMULATIVE IMPACTS ON NATIVE VEGETATION COMMUNITIES (ACRES)

Vegetation Community[a]	Total Vegetation Communities in the Cumulative Study Area[a]	Impacts to Vegetation Community from Existing Projects (Percent of vegetation Community in Cumulative Study Area)[b]	Impacts to Vegetation Community from Foreseeable Future Projects (Percent of Vegetation Community in Cumulative Study Area)[c]	Contribution of Alternative 1 to Future Cumulative Impacts (Percent of Total Impacts from Future Projects)	Contribution of Alternative 2 to Future Cumulative Impacts (Percent of Total Impacts from Future Projects)	Contribution of Alternative 3 (Central Route) to Future Cumulative Impacts (Percent of Total Impacts from Future Projects)[e]	Contribution of Alternative 3 (Western Route) to Future Cumulative Impacts (Percent of Total Impacts from Future Projects)[e]
Sonoran Creosote Bush Scrub	403,579	954 (0.2%)	42,171 (10.5%)	4,372.1 (10.4%)	2,202.8 (5.2%)	24.8 (0.06%)	134.0 (0.03%)
Desert Dry Wash Woodland	108,335	1,720 (1.6%)	20,035 (18.5%)	4.2 (<0.01%)	0.9 (<0.01%)	1.2 (<0.01%)	10.3 (<0.01%)
Sand Dunes[d]	37,823	1,936 (5.1%)	7,971 (21.1%)	38.0 (0.5%)	0.0 (0.0%)	38.0 (0.5%)	38.0 (0.5%)
Agriculture, Developed	68,415	516 (0.8%)	252 (0.4%)	2.3 [d] (<0.01%)	2.3 [d] (<0.01%)	0.0	0.0

NOTES:

a Vegetation cover types were based on the BLM NECO Plant Communities dataset (BLM, 2002) compiled by the Biogeography Lab at the U.C. Santa Barbara and coordinated through the USGS Biological Resources Division UC Santa Barbara GAP Analysis, updated during the NECO planning effort (BLM, 2002).

b Includes existing projects and foreseeable future projects within the cumulative analysis area identified in Figure 4.3-1.

c Note that sand dune habitat was derived using land form data, which significantly overlaps with vegetation community data. Most of the sand dune habitat is characterized as Sonoran creosote bush scrub habitat in the BLM NECO Plant Communities dataset.

d Impacted areas from the MSEP include agricultural lands that were previously counted as ‘impacted’ by the BSPP.

e To facilitate comparison of alternatives, the impact area is presented for the entire gen-tie line alignment, with impacts for areas that are unique to each alignment presented in parentheses.

SOURCE: BLM, 2010; Tetra Tech EC, 2012a

within the geographic scope and the cumulative impacts on each community type from existing and foreseeable future projects. These acreages were calculated using the list of cumulative projects that are located in the Palo Verde Valley and lower Chuckwalla Valley.

A total loss of 10.5 percent of the Sonoran creosote bush scrub habitat and 18.5 percent of the desert dry wash woodland habitat in the cumulative analysis area is projected to occur as a result of existing and foreseeable future projects. As shown in Table 4.3-5, implementation of Alternative 1 would contribute 10.4 percent (1.1 percent of Sonoran creosote bush scrub in the cumulative analysis area) and Alternative 2 would contribute 5.2 percent (0.6 percent of Sonoran creosote bush scrub in the cumulative analysis area) to this cumulative impact on Sonoran creosote bush scrub. If selected, the contribution of an Alternative 3 option would replace the contribution of the Alternative 1 gen-tie line or would be additive with the contribution from Alternative 2, depending on the alternative selected. Sonoran creosote bush scrub is not identified as a BLM or CDFG sensitive vegetation community.

Special-Status Plant Species

As discussed above, the development of numerous large-scale projects, such other wind and solar generation facilities, would result in a substantial permanent conversion of desert habitat to industrial and commercial uses, which would remove habitat for many special-status plant species and cacti. Therefore, the loss of this habitat is anticipated to result in substantial cumulative impacts on populations of many special-status plant species and cacti. However, preparation of the Habitat Enhancement/Restoration Plan, Revegetation Plan (to restore temporarily disturbed areas), Decommissioning and Reclamation Plan, and other plans as required in APM BIO-2p (*Cleanup and Restoration; Revegetation Plan*), and the implementation of Mitigation Measures VEG-7, VEG-8, VEG-10, VEG-11, VEG-12, WIL-4, WIL-10, WIL-15, and WIL-16, provide for the salvage of rare plants and cacti, avoidance of special-status plants whenever possible, compensatory mitigation, and site restoration following decommissioning and would minimize the loss of special-status plant species and protect similar habitat off-site. Implementation of these measures would reduce the Project’s contribution to a cumulative impact on special-status plant species, but the effect would remain substantial following the implementation of mitigation. With the limited amount of grading that would occur under the Project due to Project design and the implementation of mitigation measures, on-site special-status plant species and associated vegetation communities are expected to persist following site decommissioning. The protection measures listed above would allow the continued presence of native vegetation communities and rare plant populations during the operational phase of the Project. With the limited ground disturbance, it is reasonable to expect that the Project could disturb 50 percent or less of the on-site Sonoran creosote bush scrub habitat and associated rare plant populations.

Sensitive Natural Communities

The development of numerous large-scale projects, such other wind and solar generation facilities, within the Palo Verde Valley would result in a substantial permanent conversion of desert habitat to industrial or commercial uses. The total projected loss of 18.5 percent of desert dry wash woodland habitat in the cumulative analysis area from existing and foreseeable future projects would result in a cumulative impact. However, the Project was configured to avoid and minimize effects to this natural community. As Table 4.3-5 shows, the estimated impact of between 2.1 and 10.3 acres constitutes less than 0.01 percent of the total future effects to this vegetation community in the cumulative analysis area (Table 4.3-5). However, the implementation of the required Habitat Enhancement/Restoration Plan, Revegetation Plan, Decommissioning and Reclamation Plan, and other plans as required in APMs BIO-2p (*Cleanup and Restoration; Revegetation Plan*), BIO-4 (*Desert Tortoise Compensation*), HYDRO-1 (*Impacts to State-jurisdictional Waters*) and Mitigation Measures VEG-7, VEG-8, VEG-10, VEG-11, VEG-12, WIL-4, WIL-10, WIL-15, and WIL-16, would ensure that the loss of desert dry wash woodland habitat from the MSEP is adequately compensated for and equivalent habitat would be protected off-site. Implementation of these measures would reduce the Project's contribution to a cumulative impact on sensitive natural communities.

4.3.8 Mitigation Measures

VEG-1: Qualifications of Designated Biologist. The Applicant shall assign at least one Designated Biologist to the Project. The Applicant shall submit the resume of the proposed Designated Biologist(s), with at least three references and contact information, to the BLM AO for approval in consultation with CDFG and USFWS.

The Designated Biologist must meet the following minimum qualifications:

1. Bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field;
2. Three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society;
3. Have at least one year of field experience with biological resources found in or near the Project area;
4. Meet the current USFWS Authorized Biologist qualifications criteria (www.fws.gov/ventura/speciesinfo/protocols_guidelines), demonstrate familiarity with protocols and guidelines for the desert tortoise, and be approved by the USFWS;
5. Possess a CESA Memorandum of Understanding pursuant to §2081(a) for desert tortoise.

In lieu of the above requirements, the resume shall demonstrate to the satisfaction of the BLM AO, in consultation with CDFG and USFWS, that the proposed Designated Biologist or alternate has the appropriate training and background to effectively implement the mitigation measures.

VEG-2: Duties of the Designated Biologist. The Applicant shall ensure that the Designated Biologist performs the activities described below during any site mobilization activities, construction-related ground disturbance, grading, boring or trenching activities. The Designated Biologist may be assisted by the approved Biological Monitor(s) but remains the contact for the Applicant and the BLM AO. The Designated Biologist Duties shall include the following:

1. Advise the Applicant's construction and operation managers on the implementation of the biological resources mitigation measures;

2. Consult on the preparation of the Biological Resources Mitigation, Implementation, and Monitoring Plan (BRMIMP) to be submitted by the Applicant;

3. Be available to supervise, conduct and coordinate mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as special-status species or their habitat;

4. Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;

5. Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (e.g., parking lots) for animals in harm's way;

6. Notify the Applicant and the BLM AO of any non-compliance with any biological resources mitigation measure;

7. Respond directly to inquiries of the BLM AO regarding biological resource issues;

8. Maintain written records of the tasks specified above and those included in the BRMIMP. Summaries of these records shall be submitted in the Monthly Compliance Report and the Annual Compliance Report;

9. Train the Biological Monitors as appropriate, and ensure their familiarity with the BRMIMP, Worker Environmental Awareness Program (WEAP) training, and USFWS guidelines on desert tortoise surveys and handling procedures[1]; and

10. Maintain the ability to be in regular, direct communication with representatives of CDFG, USFWS, and the BLM AO, including notifying these agencies of dead or injured listed species and reporting special-status species observations to the California Natural Diversity Data Base.

VEG-3: Identification of Biological Monitors. The Designated Biologist shall submit the resume, at least three references, and contact information of the proposed Biological Monitors to the BLM AO. The resume shall demonstrate, to the satisfaction of the BLM AO, the appropriate education and experience to accomplish the assigned biological resource tasks. The Biological Monitor is the equivalent of the USFWS-approved biologist (also "Service-approved biologist").

Biological Monitor(s) training by the Designated Biologist shall include familiarity with the mitigation measures, BRMIMP, WEAP, and USFWS guidelines on desert tortoise surveys and handling procedures.

VEG-4: Duties of Biological Monitors. The Biological Monitors shall assist the Designated Biologist in conducting surveys and in monitoring of site mobilization activities, construction-

[1] Available at: http://www.fws.gov/ventura/species_information/protocols_guidelines/

related ground disturbance, grading, boring or trenching. The Designated Biologist shall remain the contact for the Applicant and the BLM AO.

VEG-5: Authority of the Designated Biologist And Biological Monitors. The Applicant's construction/operation manager shall act on the advice of the Designated Biologist and Biological Monitor(s) to ensure conformance with the biological resources mitigation measures. The Designated Biologist shall have the authority to immediately stop any activity that is not in compliance with these conditions and/or order any reasonable measure to avoid take of an individual of a listed species. If required by the Designated Biologist and Biological Monitor(s) the Applicant's construction/operation manager shall halt all site mobilization, ground disturbance, grading, boring, trenching and operation activities in areas specified by the Designated Biologist. The Designated Biologist shall:

1. Require a halt to all activities in any area when determined that there would be an unauthorized adverse impact to biological resources if the activities continued;

2. Inform the Applicant and the construction/operation manager when to resume activities; and

3. Notify the BLM AO and if there is a halt of any activities and advise them of any corrective actions that have been taken or would be instituted as a result of the work stoppage.

If the Designated Biologist is unavailable for direct consultation, the Biological Monitor shall act on behalf of the Designated Biologist.

VEG-6: Worker Environmental Awareness Program. The Applicant shall develop and implement a Project-specific Worker Environmental Awareness Program (WEAP) and shall secure approval for the WEAP from the AO. The WEAP shall be administered to all on-site personnel including surveyors, construction engineers, employees, contractors, contractor's employees, supervisors, inspectors, subcontractors, and delivery personnel. The WEAP shall be implemented during site preconstruction, construction, operation, and closure. The WEAP shall:

1. Be developed by or in consultation with the Designated Biologist and consist of an on-site or training center presentation in which supporting written material and electronic media, including photographs of protected species, is made available to all participants;

2. Discuss the locations and types of sensitive biological resources on the Project site and adjacent areas, and explain the reasons for protecting these resources; provide information to participants that no snakes, reptiles, or other wildlife shall be harmed;

3. Place special emphasis on desert tortoise, including information on physical characteristics, distribution, behavior, ecology, sensitivity to human activities, legal protection, penalties for violations, reporting requirements, and protection measures;

4. Include a discussion of fire prevention measures to be implemented by workers during Project activities; request workers dispose of cigarettes and cigars appropriately and not leave them on the ground or buried;

5. Describe the temporary and permanent habitat protection measures to be implemented at the Project site;

6. Identify whom to contact if there are further comments and questions about the material discussed in the program; and

7. Include a training acknowledgment form to be signed by each worker indicating that they received training and shall abide by the guidelines.

The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist and BLM AO.

VEG-7: Biological Resources Mitigation Implementation and Monitoring Plan. The Applicant shall develop a BRMIMP, and shall submit two copies of the proposed BRMIMP to the BLM AO for review and approval. The Applicant shall implement the measures identified in the approved BRMIMP. The BRMIMP shall incorporate avoidance and minimization measures described in final versions of the Invasive Weed Management Plan (Mitigation Measure VEG-9), the Special-Status Plant Species Impact Avoidance and Mitigation Plan (Mitigation Measure VEG-10) and Decommissioning and Reclamation Plan (Mitigation Measure VEG-12), the Desert Tortoise Relocation Translocation Plan (Mitigation Measure WIL-2), the Raven Management Plan (Mitigation Measure WIL-5), the Burrowing Owl Mitigation and Monitoring Plan (Mitigation Measure WIL-9), and all other biological mitigation and/or monitoring plans associated with the Project.

The BRMIMP shall be prepared in consultation with the Designated Biologist and shall include accurate and up-to-date maps depicting the location of sensitive biological resources that require temporary or permanent protection during construction and operation. The BRMIMP shall include complete and detailed descriptions of the following:

1. All biological resources mitigation, monitoring, and compliance measures proposed and agreed to by the Applicant;

2. All biological resources mitigation measures identified as necessary to avoid or mitigate impacts;

3. All biological resource mitigation, monitoring and compliance measures required in federal agency terms and conditions, such as those provided in the USFWS Biological Opinion;

4. All sensitive biological resources to be impacted, avoided, or mitigated by Project construction, operation, and closure;

5. All required mitigation measures for each sensitive biological resource;

6. All measures that shall be taken to avoid or mitigate temporary disturbances from construction activities;

7. Duration for each type of monitoring and a description of monitoring methodologies and frequency;

8. Performance standards to be used to help decide if/when proposed mitigation is or is not successful;

9. All performance standards and remedial measures to be implemented if performance standards are not met;

10. Biological resources-related facility closure measures including a description of funding mechanism(s);

11. A process for proposing plan modifications to the BLM AO and appropriate agencies for review and approval; and

12. A requirement to submit any sightings of any special-status species that are observed on or in proximity to the Project site, or during Project surveys, to the CNDDB per CDFG requirements.

VEG-8: The Applicant shall undertake the following measures to manage the construction site and related facilities in a manner to avoid or minimize impacts to biological resources:

1. ***Limit Area of Disturbance.*** The boundaries of all areas to be disturbed (including staging areas, access roads, and sites for temporary placement of spoils) shall be delineated with stakes and flagging prior to construction activities in consultation with the Designated Biologist. Spoils and topsoil shall be stockpiled in disturbed areas lacking native vegetation and which do not provide habitat for special-status species. Parking areas, staging and disposal site locations shall similarly be located in areas without native vegetation or special-status species habitat. All disturbances, Project vehicles and equipment shall be confined to the flagged areas.

2. ***Minimize Road Impacts.*** New and existing roads that are planned for construction, widening, or other improvements shall not extend beyond the flagged impact area as described above. All vehicles passing or turning around would do so within the planned impact area or in previously disturbed areas. Where new access is required outside of existing roads or the construction zone, the route shall be clearly marked (i.e., flagged and/or staked) prior to the onset of construction.

3. ***Minimize Traffic Impacts.*** Vehicular traffic during Project construction and operation shall be confined to existing routes of travel to and from the Project site, and cross country vehicle and equipment use outside designated work areas shall be prohibited. The speed limit shall not exceed 25 miles per hour within the Project area, on maintenance roads for linear facilities, or on access roads to the Project site, except on paved access roads where the speed limit shall not exceed 45 miles per hour.

4. ***Monitor During Construction.*** In areas that have not been fenced with desert tortoise exclusion fencing and cleared, the Designated Biologist shall be present at the construction site during all Project activities that have potential to disturb soil, vegetation, and wildlife. The Designated Biologist or Biological Monitor shall walk immediately ahead of equipment during brushing and grading activities.

5. ***Minimize Impacts of Transmission/Pipeline Alignments, Roads, Staging Areas.*** Staging areas for construction on the plant site shall be within the area that has been fenced with desert tortoise exclusion fencing and cleared. For construction activities outside of the plant site (transmission line, pipeline alignments) access roads, pulling sites, and storage and parking areas shall be designed, installed, and maintained with the goal of minimizing impacts to native plant communities and sensitive biological resources. Transmission lines and all electrical components shall be designed, installed, and maintained in accordance with the Avian Power Line Interaction Committee's (APLIC's) Suggested Practices for Avian Protection on Power Lines (APLIC, 2006) and Mitigating Bird Collisions with Power Lines (APLIC, 1994) to reduce the likelihood of large bird electrocutions and collisions.

6. ***Avoid Use of Toxic Substances.*** Soil bonding and weighting agents used on unpaved surfaces shall be non-toxic to wildlife and plants.

7. ***Minimize Lighting Impacts.*** Facility lighting shall be designed, installed, and maintained to prevent side casting of light towards wildlife habitat.

8. ***Minimize Noise Impacts.*** A continuous low-pressure technique shall be used for steam blows, to the extent possible, in order to reduce noise levels in sensitive habitat proximate to the Project. Loud construction activities (e.g., unsilenced high pressure steam blowing and pile driving, or other) shall be avoided from February 15 to April 15 when it would result in noise levels over 65 dBA in nesting habitat (excluding noise from passing vehicles). Loud construction activities may be permitted from February 15 to April 15 only if:

    a. the Designated Biologist provides documentation (e.g., nesting bird data collected using methods described in Mitigation Measure WIL-7 and maps depicting location of the nest survey area in relation to noisy construction) to the BLM AO indicating that no active nests would be subject to 65 dBA noise, or

    b. the Designated Biologist or Biological Monitor monitors active nests within the range of construction-related noise exceeding 65 dBA. The monitoring shall be conducted in accordance with Nesting Bird Monitoring and Management Plan approved by the BLM AO. The Plan shall include adaptive management measures to prevent disturbance to nesting birds from construction related noise. Triggers for adaptive management shall be evidence of Project-related disturbance to nesting birds such as: agitation behavior (displacement, avoidance, and defense); increased vigilance behavior at nest sites; changes in foraging and feeding behavior, or nest site abandonment. The Bird Monitoring and Management Plan shall include a description of adaptive management actions, which shall include, but not be limited to, cessation of construction activities that are deemed by the Designated Biologist to be the source of disturbance to the nesting bird.

9. ***Avoid Vehicle Impacts to Desert Tortoise.*** Parking and storage shall occur within the area enclosed by desert tortoise exclusion fencing to the extent feasible. No vehicles or construction equipment parked outside the fenced area shall be moved prior to an inspection of the ground beneath the vehicle for the presence of desert tortoise. If a desert tortoise is observed, it would be left to move on its own. If it does not move within 15 minutes, a Designated Biologist or Biological Monitor under the Designated Biologist's direct supervision may remove and relocate the animal to a safe location if temperatures are within the range described in the USFWS' 2009 Desert Tortoise Field Manual.[2]

10. ***Avoid Wildlife Pitfalls*:**

    a. Backfill Trenches. At the end of each work day, the Designated Biologist shall ensure that all potential wildlife pitfalls (trenches, bores, and other excavations) outside the area fenced with desert tortoise exclusion fencing have been backfilled. If backfilling is not feasible, all trenches, bores, and other excavations shall be sloped at a 3:1 ratio at the ends to provide wildlife escape ramps, or covered completely to prevent wildlife access, or fully enclosed with desert tortoise-exclusion fencing. All trenches, bores, and other excavations outside the areas permanently fenced with desert tortoise exclusion fencing shall be inspected periodically throughout the day, at the

[2] Available at: http://www.fws.gov/ventura/species_information/protocols_guidelines/

end of each workday and at the beginning of each day by the Designated Biologist or a Biological Monitor. Should a tortoise or other wildlife become trapped, the Designated Biologist or Biological Monitor shall remove and relocate the individual as described in the Desert Tortoise Relocation/Translocation Plan. Any wildlife encountered during the course of construction shall be allowed to leave the construction area unharmed.

b. Avoid Entrapment of Desert Tortoise. Any construction pipe, culvert, or similar structure with a diameter greater than 3 inches, stored less than 8 inches aboveground and within desert tortoise habitat (i.e., outside the permanently fenced area) for one or more nights, shall be inspected for tortoises before the material is moved, buried or capped. As an alternative, all such structures may be capped before being stored outside the fenced area, or placed on pipe racks. These materials would not need to be inspected or capped if they are stored within the permanently fenced area after the clearance surveys have been completed.

11. ***Minimize Standing Water.*** Water applied to dirt roads and construction areas (trenches or spoil piles) for dust abatement shall use the minimal amount needed to meet safety and air quality standards in an effort to prevent the formation of puddles, which could attract desert tortoises and common ravens to construction sites. A Biological Monitor shall patrol these areas to ensure water does not puddle and shall take appropriate action (e.g., coordinating with the contractor to reduce watering frequency) to reduce water application where necessary.

12. ***Dispose of Road-killed Animals.*** Road-killed animals or other carcasses detected on roads near the Project area shall be immediately reported to the Designated Biologist and picked up within 24 hours. The contractor and Designated Biologist shall be responsible for securing all required federal or State permits to handle and dispose of collected animals, including handling and disposal for scientific use. For special-status species roadkill, the Biological Monitor shall contact CDFG, and USFWS within 1 working day of receipt of the carcass for guidance on disposal or storage of the carcass. The Biological Monitor shall maintain and report special-status species records as described in Mitigation Measure WIL-3.

13. ***Minimize Spills of Hazardous Materials.*** All vehicles and equipment shall be maintained in proper working condition to minimize the potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. The Designated Biologist shall be informed of any hazardous spills immediately as directed in the Project Hazardous Materials Plan. Hazardous spills shall be immediately cleaned up and the contaminated soil properly disposed of at a licensed facility. Servicing of construction equipment shall take place only at a designated area. Service/maintenance vehicles shall carry a bucket and pads to absorb leaks or spills.

14. ***Worker Guidelines.*** During construction all trash and food-related waste shall be placed in self-closing containers and removed daily from the site. Workers shall not feed wildlife or bring pets to the Project site. Except for law enforcement personnel, no workers or visitors to the site shall bring firearms or weapons. Vehicular traffic shall be confined to existing routes of travel to and from the Project site, and cross country vehicle and equipment use outside designated work areas shall be prohibited. The speed limit when traveling on dirt access routes within desert tortoise habitat shall not exceed 25 miles per hour.

15. ***Implement Erosion Control Measures.*** Standard erosion control measures shall be implemented for all phases of construction and operation where sediment run-off from exposed slopes threatens to enter “Waters of the State”. Sediment and other flow-restricting

materials shall be moved to a location where they shall not be washed back into the stream. All disturbed soils and roads within the Project site shall be stabilized to reduce erosion potential, both during and following construction. Areas of disturbed soils (access and staging areas) with slopes toward a drainage shall be stabilized to reduce erosion potential.

16. ***Monitor Ground Disturbing Activities Prior to Pre-Construction Site Mobilization.*** If pre-construction site mobilization requires ground-disturbing activities such as for geotechnical borings or hazardous waste evaluations, a Designated Biologist or Biological Monitor shall be present to monitor any actions that could disturb soil, vegetation, or wildlife.

17. ***Revegetation of Temporarily Disturbed Areas.*** The Applicant shall prepare and implement a Revegetation Plan to restore all areas subject to temporary disturbance to pre-Project grade and conditions. Temporarily disturbed areas within the Project area include, but are not limited to: all proposed locations for linear facilities, temporary access roads, berms, areas surrounding the drainage diffusers, construction work temporary lay-down areas not converted to part of the solar field, and construction equipment staging areas. The Revegetation Plan shall include a description of topsoil salvage and seeding techniques and a monitoring and reporting plan, and the following performance standards by the end of monitoring year 2:

    a. at least 80 percent of the species observed within the temporarily disturbed areas shall be native species that naturally occur in desert scrub habitats; and

    b. relative cover and density of plant species within the temporarily disturbed areas shall equal at least 60 percent.

VEG-9: Weed Management Plan. Prior to beginning construction on the Project, the Applicant will prepare, circulate to the BLM for comment and approval, and then implement an Invasive Weed Management Plan that meets the approval of BLM's AO to prevent the spread of existing weeds and the introduction of new weeds to the Project Area. The objective of the Weed Management Plan shall be to prevent the introduction of any new weeds and the spread of existing weeds as a result of Project construction, operation, and decommissioning. The Weed Management Plan shall include at a minimum the following information: specific weed management objectives and measures for each target non-native weed species; baseline conditions; a map of the Weed Management Areas; weed risk assessment and measures to prevent the introduction and spread of weeds; monitoring and surveying methods; and reporting requirements.

The Plan shall be consistent with BLM's *Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States* (BLM, 2007) and the National Invasive Species Management Plan (National Invasive Species Council, 2008), and will be implemented by the Applicant to reduce the potential for the introduction of invasive species during construction, operation and maintenance, and decommissioning of the Project. The draft plan will be reviewed and approved by the BLM.

The following measures are required in the Plan and will be implemented by the Applicant to monitor and control invasive species:

1. ***Preventative Measures During Construction.*** Equipment Cleaning: To prevent the spread of weeds into new habitats, and prior to entering the Project work areas, construction

equipment will be cleaned of dirt and mud that could contain weed seeds, roots, or rhizomes. Equipment will be inspected to ensure they are free of any dirt or mud that could contain weed seeds and the tracks, feet, tires, and undercarriage will be carefully washed, with special attention being paid to axles, frame, cross members, motor mounts, underneath steps, running boards, and front bumper/brush guard assemblies. Other construction vehicles (e.g. pick-up trucks) that will be frequently entering and exiting the site will be inspected and washed on an as-needed basis.

a. *Vehicle Washing*: All vehicles will be washed off-site when possible. Should off-site washing prove infeasible, an on-site cleaning station will be set up to clean equipment before it enters the work area. Either high-pressure water or air will be used to clean equipment and the cleaning site will be situated away from any sensitive biological resources. If possible, water used to wash vehicles and equipment will be collected and re-used. Ingress and egress will be limited to defined routes.

b. *Site Soil Management*: Soil management will consist of limiting ground disturbance to the minimum necessary for construction activities and using dust suppressants to minimize the spread of seeds. Disturbed vegetation and topsoil will be re-deposited at or near the area from which they are removed to eliminate the transport of soil-borne invasive weed seeds, roots, or rhizomes. During reclamation of the temporarily cleared areas, the contractor will return topsoil and vegetative material to the areas from which they were stripped. BLM-approved dust suppressants (e.g. water and/or palliative) will be minimized on the site as much as possible, but will use during construction to minimize the spread of airborne weed seeds, especially during very windy days. As appropriate, temporary drift fences may be installed to help control sand movement during construction.

c. *Weed-free Products*: Any use of hay or straw bales on the Project site will be limited to certified weed-free material. Other products such as gravel, mulch, and soil may also carry weeds and these products, too, will be certified weed-free. If needed, mulch will be made from the local, on-site native vegetation cleared from the Project area.

d. *Personnel Training*: Weed management will be part of mandatory site training for all construction personnel and will be included in initial Worker Environmental Awareness Program training briefings. Training will include weed identification and the threat of impacts including impacts to local agriculture, vegetation communities, wildlife, and creating fire potential. Training will also cover the importance of preventing the spread of weeds.

e. *Mechanical Weed Removal*: The Applicant primarily will use mechanical weed removal techniques with the use of herbicides restricted to BLM-approved usage in areas that are not accessible through mechanical means or where mechanical weed removal is impractical.

f. *Herbicides*: The Applicant will use only BLM-approved pre- and/or post-emergent herbicides, as applicable. Pre-emergent herbicides will be applied to the soil before the weed seed germinates and is usually incorporated into the soil with irrigation or rainfall. Post-emergent herbicides will be applied directly to plants. Herbicides will be investigated in detail, made a part of the Invasive Weed Management Plan, and approved by BLM before use.

g. *Pesticides*: Pesticide use will be limited to non-persistent, immobile pesticides applied only in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications. Any pesticide applications, if used, will be conducted within the framework of BLM and DOI policies, and will entail only the use of USEPA registered pesticides.

2. ***Containment and Control Measures.*** When Project monitoring (see below) indicates that invasive species are spreading, invasive species will be removed using mechanical and chemical methods. The Applicant will use mechanical weed removal methods as the preferred method, but herbicides may be used when conditions (such as wind, proximity of native vegetation) are such that the effect on native species is expected to be minimal. During suppression or eradication activities, care will be taken to have the least affect on native plant species. Herbicides used will be limited to those approved by the BLM. Herbicides will be applied before the invasive species flower and set seed.

   If monitoring indicates the spread of athel (*Tamarix* spp.), a woody invasive species, then athel will be controlled by cutting the trees and applying GarlonTM Ultra Herbicide to the stump immediately after cutting. GarlonTM is approved for use on athel by the BLM. All cut material generated during athel clearance will be removed from the site by truck. This material will be covered with a tarp or other material that will keep athel cuttings or seed from being spread by truck movement.

   The Applicant and its contractors will follow the BLM's Herbicide Use Standard Operating Procedures provided in Appendix B of the Record of Decision for the Final Vegetation Treatments Using Herbicides Programmatic Environmental Impact Statement (BLM, 2007). Personnel responsible for weed control will be trained in the proper and safe use of all equipment and chemicals used for weed control.

3. ***Monitoring.*** Baseline weed conditions will be assessed during the pre-construction phase of the Project, during pre-construction surveys and staking and flagging of construction areas. A stratified random sampling technique will be used to identify and count the extent of weeds on the site.

   Monitoring will take place each year during construction, and annually for three years following the completion of construction. The purpose of annual monitoring will be to determine if weed populations identified during baseline surveys have increased in density or are spreading as a result of the Project. Control methods will be implemented when measurable weed increases, as well as visually verified increases, are detected during monitoring. This will include small patches of unusually high density weeds (e.g., concentrations in swales) that are growing as a result of Project activities.

   During construction, daily monitoring records will be kept by biological monitors that will include information relevant to invasive weeds. During Project operations and maintenance, noxious and invasive weed list and provide monitoring and management appropriate to any new species in coordination with the BLM.

   After the three years of operations monitoring is complete, general management and monitoring of the Project area will be conducted by designated site personnel each year during both the germinating and early growing season (November through April) to eliminate new weed individuals prior to seed set. Throughout construction and long-term monitoring, personnel will be trained to identify weedy and native species and work with a trained vegetation monitor to determine where elimination is necessary.

4. ***Reporting.*** Results of monitoring and management efforts will be included in annual reports and a final monitoring report completed at the end of three years of post-

construction monitoring. Copies of these reports will be kept on file at the site. Copies of each annual report as well as the final monitoring report will be sent to the BLM for review and comment. BLM will use the results of these reports to determine if any additional monitoring or control measures are necessary.

5. ***Success Criteria.*** Weed control will be ongoing on the Project site for the life of the Project, but plan success will be determined by BLM after the three years of operations monitoring through the reporting and review process. Success criteria will be defined as having no more than ten percent increase in a weed species or in overall weed cover in any part of the Project.

VEG-10: Special-Status Plant Species Impact Avoidance and Minimization, and Compensation. For this four-part measure, the Applicant shall: A) prepare and implement a Special-Status Plant Species Impact Avoidance and Mitigation Plan that meets the approval of BLM AO; B) ensure adequate special-status plant surveys and reporting; C) avoid, minimize and mitigate for impacts to special-status plants; and D) fund or support a compensatory mitigation program for special-status plants through land acquisition, restoration/enhancement, or a combination of acquisition and restoration/ enhancement.

The Applicant shall implement measures **VEG-1** through **VEG-8**, and **VEG-10** to avoid, minimize, and compensate for impacts to special-status plant species. In this discussion the term "Project Disturbance Area" encompasses all areas to be temporarily and permanently disturbed by the Project, including the plant site, linear facilities, and areas disturbed by temporary access roads, fence installation, construction work lay-down and staging areas, parking, storage, or by any other activities resulting in disturbance to soil or vegetation.

A) Special-Status Plant Impact Avoidance and Minimization Measures

This measure contains the Best Management Practices and other measures designed to avoid accidental impacts to plants occurring outside of the Project Disturbance Area and within 100 feet of the Project Disturbance Area during construction, operation, and decommissioning.

Special-Status Plant Impact Avoidance and Minimization Measures. The Applicant shall incorporate all measures for protecting special-status plants in close proximity to the site into the BRMIMP (Mitigation Measure VEG-7). These measures shall include the following elements:

a) *Site Design Modifications*: Incorporate site design modifications to minimize impacts to special-status plants along the Project linears: limiting the width of the work area; adjusting the location of staging areas, lay downs, spur roads and poles or towers; driving and crushing vegetation as an alternative to blading temporary roads to preserve the seed bank, and minor adjustments to the alignment of the roads and pipelines within the constraints of the ROW. Design the engineered channel discharge points to maintain the natural surface drainage patterns between the engineered channel and the outlet of the natural washes that flow toward the south and east, downstream of the Project These modifications shall be clearly depicted on the grading and construction plans, and on report-sized maps in the BRMIMP.

b) *Establish Environmentally Sensitive Areas (ESAs)*. Prior to the start of any ground- or vegetation-disturbing activities, a qualified Project biologist shall establish ESAs to protect avoided special-status plants that occur outside of the Project Disturbance

Areas and within 100 feet of Project Disturbance Areas. This includes plant occurrences identified during the late season 2011 surveys. The locations of ESAs shall be clearly depicted on construction drawings, which shall also include all avoidance and minimization measures on the margins of the construction plans. The boundaries of the ESAs shall be placed a minimum of 20 feet from the uphill side of the occurrence and 10 feet from the downhill side. Where this is not possible due to construction constraints, other protection measures, such as silt-fencing and sediment controls, may be employed to protect the occurrences. Equipment and vehicle maintenance areas, and wash areas, shall be located 100 feet from the uphill side of any ESAs. ESAs shall be clearly delineated in the field with temporary construction fencing and signs prohibiting movement of the fencing or sediment controls under penalty of work stoppages and additional compensatory mitigation. ESAs shall also be clearly identified (with signage or by mapping on site plans) to ensure that avoided plants are not inadvertently harmed during construction, operation, or closure.

c) *Special-Status Plant Worker Environmental Awareness Program (WEAP)*. The WEAP (Mitigation Measure VEG-6) shall include training components specific to protection of special-status plants that may occur in the Study Area.

d) *Herbicide and Soil Stabilizer Drift Control Measures*. Special-status plant occurrences within 100 feet of the Project Disturbance Area shall be protected from herbicide and soil stabilizer drift. The Invasive Weed Management Plan (Mitigation Measure VEG-9) shall include measures to avoid chemical drift or residual toxicity to special-status plants consistent with guidelines such as those provided by the Nature Conservancy's The Global Invasive Species Team (Hillmer and Liedtke, 2003), the USEPA, and the Pesticide Action Network Database.[3]

e) *Erosion and Sediment Control Measures*. Erosion and sediment control measures shall not inadvertently impact special-status plants (e.g., by using invasive or non-native plants in seed mixes, introducing pest plants through contaminated seed or straw, etc.). These measures shall be incorporated in any required Drainage, Erosion, and Sedimentation Control Plans.

f) *Avoid Special-Status Plant Occurrences*. Areas for spoils, equipment, vehicles, and materials storage areas; parking; equipment and vehicle maintenance areas, and wash areas shall be placed at least 100 feet from any ESAs.

g) *Monitoring and Reporting Requirements*. The Designated Botanist shall conduct weekly monitoring of the ESAs that protect special-status plant occurrences during construction and decommissioning activities.

B) Ensure Adequate Special-Status Plant Surveys And Reporting (Applies to Alternative 3 Routes)

At least 30 days prior to construction, the Applicant shall ensure that botanical surveys have been fully performed and reported on the Alternative 3 Routes, as described below:

1. ***Survey Timing.*** Surveys shall be timed to detect: a) summer annuals triggered to germinate by the warm, tropical summer storms (which may occur any time between June and October). Fall-blooming perennials that respond to the cooler, later season storms (typically beginning in September or October) shall only be required if blooms and seeds are necessary for identification or the species are summer-deciduous and require leaves for identification. The surveys shall not be timed to

[3] Available at: http://www.pesticideinfo.org

coincide with the statistical peak bloom period of the target species but shall instead be based on plant phenology and the timing of a significant storm event (i.e., a 10mm or greater rain or multiple storm events of sufficient volume to trigger germination, as measured at or within 1 mile of the Project site). Surveys shall occur at the appropriate time to capture the characteristics necessary to identify the taxon.

2. ***Surveyor Qualifications and Training.*** Surveys shall be conducted by a qualified botanist knowledgeable in the complex biology of the local flora, and consistent with CDFG protocols (CDFG, 2009). Each surveyor shall be equipped with a GPS unit and record a complete tracklog; these data shall be compiled and submitted along with the Summer-Fall Survey Botanical Report (described below). Prior to the start of surveys, all crew members shall, at a minimum, visit reference sites (where available) and/or review herbarium specimens of all BLM Sensitive plants, CNPS List 1B or 2 (Nature Serve rank S1 and S2) or proposed List 1B or 2 taxa, and any new reported or documented taxa, to obtain a search image. Because the potential for range extensions is unknown, the list of potentially occurring special-status plants shall include all special-status taxa known to occur within the Sonoran Desert region and the eastern portion of the Mojave in California. The list shall also include taxa with bloom seasons that begin in fall and extend into the early spring as many of these are reported to be easier to detect in fall, following the start of the fall rains.

3. ***Survey Coverage.*** The survey coverage or intensity shall be in accordance with the most recent BLM Survey Protocols, which specify that intuitive controlled surveys shall only be accomplished by botanists familiar with the habitats and species that may reasonably be expected to occur in the project area (BLM, 2009).

4. ***Documenting Occurrences.*** If a special-status plant is detected, the full extent of the population on-site shall be recorded using GPS in accordance with BLM survey protocols. Additionally, the extent of the population within one mile of Project boundaries shall be assessed at least qualitatively to facilitate an accurate estimation of the proportion of the population affected by the Project. For populations that are very dense or very large, the population size may be estimated by simple sampling techniques. When populations are very extensive or locally abundant, the surveyor must provide some basis for this assertion and roughly map the extent on a topographic map. All but the smallest populations (e.g., a population occupying less than 100 square feet) shall be recorded as area polygons; the smallest populations may be recorded as point features. All GPS-recorded occurrences shall include: the number of plants, phenology, observed threats (e.g., OHV or invasive exotics), and habitat or community type. The map of occurrences submitted with the final botanical report shall be prepared to ensure consistency with definition of an occurrence by CNDDB, i.e., occurrences found within 0.25 miles of another occurrence of the same taxon, and not separated by significant habitat discontinuities, shall be combined into a single ‘occurrence’. The Applicant shall also submit the raw GPS shape files and metadata, and completed CNDDB forms for each ‘occurrence’ (as defined by CNDDB).

5. ***Reporting.*** Raw GPS data, metadata, and CNDDB field forms shall be provided to the BLM AO within two weeks of the completion of each survey. If surveys are split into two or more periods (e.g., a late summer survey and a fall survey), then a summary letter shall be submitted following each survey period.

6. The Final Summer-Fall Botanical Survey Report shall be prepared consistent with CDFG guidelines (CDFG, 2009), and BLM 2009 guidelines and shall include all of the following components:

a) the BLM designation, NatureServe Global and State Rank of each species or taxon found (or proposed rank, or CNPS List);

b) the number or percent of the occurrence that will be directly affected, and indirectly affected by changes in drainage patterns or altered geomorphic processes;

c) the habitat or plant community that supports the occurrence and the total acres of that habitat or community type that occurs in the Project Disturbance Area;

d) an indication of whether the occurrence has any local or regional significance (e.g., if it exhibits any unusual morphology, occurs at the periphery of its range in California, represents a significant range extension or disjunct occurrence, or occurs in an atypical habitat or substrate);

e) a completed CNDDB field form for every occurrence (occurrences of the same species within one-quarter mile or less of each other combined as one occurrence, consistent with CNDDB methodology), and

f) two maps: one that depicts the raw GPS data (as collected in the field) on a topographic base map with Project features; and a second map that follows the CNDDB protocol for occurrence mapping.

C) Avoidance Requirements for Special-Status Plants

The Applicant shall avoid impacts to special-status plant populations whenever possible, as described below.

1. Mitigation for CNDDB Rank 1, 2, and 3 Plants – Avoidance on Linear Corridors Required: If species with a CNDDB rank of 1, 2, or 3 are detected within the Project Disturbance Area, the Applicant shall prepare and implement a Special-Status Plant Mitigation Plan (Plan) that describes measures to avoid and minimize impacts to plant populations on the Project linear corridors and construction laydown areas, unless such avoidance would create greater environmental impacts in other resource areas (e.g. Cultural Resource Sites) or other restrictions (e.g., FAA or other restrictions for placement of transmission poles). The Applicant shall provide compensatory mitigation as described below in Mitigation Measure VEG-10.D for impacts to Rank 1, 2, and 3 plants that cannot be avoided. The content of the Plan and definitions shall be as described above in Mitigation Measure VEG-10.C (1).

2. Preservation of the Germplasm of Affected Special-Status Plants. For all significant impacts to special-status plants, regardless of whether compensatory mitigation is required, mitigation shall include seed collection from the affected special-status plants on-site prior to construction to conserve the germplasm and provide a seed source for restoration efforts. The seed shall be collected under the supervision or guidance of a reputable seed storage facility such as the Rancho Santa Ana Botanical Garden Seed Conservation Program, San Diego Natural History Museum, or the Missouri Botanical Garden. The costs associated with the long-term storage of the seed shall be the responsibility of the Applicant. Any efforts to propagate and reintroduce special-status plants from seeds in the wild shall be carried out under the direct supervision of specialists such as those listed above and as part of a Habitat Restoration/Enhancement Plan approved by the BLM AO.

D) Off-Site Compensatory Mitigation for Special-Status Plants

This section describes performance standards for mitigation for a range of options for compensatory mitigation.

Where compensatory mitigation is required under the terms of Mitigation Measure VEG-10.C, above, the Applicant shall mitigate Project impacts to special-status plant occurrences with compensatory mitigation. Compensatory mitigation shall consist of acquisition of habitat supporting the target species, or restoration/enhancement of populations of the target species, and shall meet the performance standards for mitigation described below. Compensatory mitigation shall be at a ratio of 3:1 for Rank 1 plants, with 3 acres of habitat acquired or restored/enhanced for every acre of habitat occupied by the special-status plant that will be disturbed by the Project Disturbance Area (for example, if the area occupied by the special-status plant collectively measured is 0.25 acre, the compensatory mitigation will be 0.75 acre). The mitigation ratio for Rank 2 plants shall be 2:1. So, for the example above, the mitigation ratio would be 0.5 acre for the Rank 2 plants.

The Applicant shall provide funding for the acquisition and/or restoration/ enhancement, initial improvement, and long-term maintenance and management of the acquired or restored lands. The actual costs to comply with this condition will vary depending on the Project Disturbance Area, the actual costs of acquiring compensation habitat, the actual costs of initially improving the habitat, the actual costs of long-term management as determined by a Property Analysis Record (PAR) report, and other transactional costs related to the use of compensatory mitigation.

The Applicant shall comply with other related requirements of this measure, as follows:

I. *Compensatory Mitigation by Acquisition*: The requirements for the acquisition initial protection and habitat improvement, and long-term maintenance and management of special-status plant compensation lands include all of the following:

1. *Selection Criteria for Acquisition Lands*. The compensation lands selected for acquisition may include any of the following three categories:

   a. Occupied Habitat, No Habitat Threats: The compensation lands selected for acquisition shall be occupied by the target plant population and shall be characterized by site integrity and habitat quality that are required to support the target species, and shall be of equal or better habitat quality than that of the affected occurrence. The occurrence of the target special-status plant on the proposed acquisition lands should be viable, stable or increasing (in size and reproduction).

   b. Occupied Habitat, Habitat Threats. Occupied compensation lands characterized by habitat threats may also be acquired as long as the population could be reasonably expected to recover with habitat restoration efforts (e.g., OHV or grazing exclusion, or removal of invasive non-native plants) and is accompanied by a Habitat Enhancement/Restoration Plan as described in Mitigation Measure VEG-10.D.II, below.

   c. Unoccupied but Adjacent. The Applicant may also acquire habitat for which occupancy by the target species has not been documented, if the proposed acquisition lands are adjacent to occupied habitat. The Applicant shall provide evidence that acquisitions of such unoccupied lands would improve the defensibility and long-term sustainability of the occupied habitat by providing a protective buffer around the occurrence and by enhancing connectivity with undisturbed habitat. This acquisition may include habitat restoration efforts where appropriate, particularly when these restoration efforts will benefit adjacent habitat that is occupied by the target species.

2. *Review and Approval of Compensation Lands Prior to Acquisition*. The Applicant shall submit a formal acquisition proposal to the BLM AO describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for special-status plants in relation to the criteria listed above, and must be approved by the BLM AO.

3. *Management Plan*. The Applicant or approved third party shall prepare a management plan for the compensation lands in consultation with the entity that will be managing the lands. The goal of the management plan shall be to support and enhance the long-term viability of the target special-status plant occurrences. The Management Plan shall be submitted for review and approval to the BLM AO.

4. *Integrating Special-Status Plant Mitigation with Other Mitigation lands*. If all or any portion of the acquired Desert Tortoise, Waters of the State, or other required compensation lands meets the criteria above for special-status plant compensation lands, the portion of the other species' or habitat compensation lands that meets any of the criteria above may be used to fulfill that portion of the obligation for special-status plant mitigation.

5. *Compensation Lands Acquisition Requirements*. The Applicant shall comply with the following requirements relating to acquisition of the compensation lands after the BLM AO, has approved the proposed compensation lands:

    a. Preliminary Report. The Applicant, or an approved third party, shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary or requested documents for the proposed compensation land to the BLM AO. All documents conveying or conserving compensation lands and all conditions of title are subject to review and approval by the BLM AO. For conveyances to the state, approval may also be required from the California Department of General Services, the Fish and Game Commission and the Wildlife Conservation Board.

    b. Title/Conveyance. The Applicant shall acquire and transfer fee title to the compensation lands, a conservation easement over the lands, or both fee title and conservation easement, as required by the BLM AO. Any transfer of a conservation easement or fee title must be to CDFG, a non-profit organization qualified to hold title to and manage compensation lands (pursuant to California Government Code §65965), or to BLM or other public agency approved by the BLM AO. If an approved non-profit organization holds fee title to the compensation lands, a conservation easement shall be recorded in favor of CDFG or another entity approved by the BLM AO. If an entity other than CDFG holds a conservation easement over the compensation lands, the BLM AO may require that CDFG or another entity approved by the BLM AO, in consultation with CDFG, be named a third party beneficiary of the conservation easement. The Applicant shall obtain approval of the BLM AO of the terms of any transfer of fee title or conservation easement to the compensation lands.

    c. Initial Protection and Habitat Improvement. The Applicant shall fund activities that the BLM AO requires for the initial protection and habitat improvement of the compensation lands. These activities will vary depending on the condition and location of the land acquired, but may include trash removal, construction and repair of fences, invasive plant removal, and similar measures to protect habitat and improve habitat quality on the compensation lands. The costs of these activities are estimated to be $330 per acre, using the estimated cost per acre for Desert Tortoise mitigation as a best available proxy, at the ratio of 3:1 for Rank 1 plants and 2:1 for Rank 2 plants, but actual costs will vary depending on the measures that are required for the compensation lands. A non-profit organization, CDFG or another public agency may hold and expend the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California Government Code §65965), if it meets the approval of the BLM AO in consultation with CDFG, and if it is authorized to participate in implementing the required activities on the compensation lands. If CDFG takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFG or its designee.

d. Property Analysis Record. Upon identification of the compensation lands, the Applicant shall conduct a PAR or PAR-like analysis to establish the appropriate amount of the long-term maintenance and management fund to pay the in-perpetuity management of the compensation lands. The PAR or PAR-like analysis must be approved by the BLM AO before it can be used to establish funding levels or management activities for the compensation lands.

e. Long-term Maintenance and Management Funding. In accordance with Mitigation Measure VEG-13 (*Phasing*), the Applicant shall deposit in the National Fish and Wildlife Foundation's (NFWF) Renewable Energy Action Team (REAT) Account a non-wasting capital long-term maintenance and management fee in the amount determined through the PAR or PAR-like analysis conducted for the compensation lands.

f. The BLM AO, in consultation with CDFG, may designate another non-profit organization to hold the long-term maintenance and management fee if the organization is qualified to manage the compensation lands in perpetuity. If CDFG takes fee title to the compensation lands, CDFG shall determine whether it will hold the long-term management fee in the special deposit fund, leave the money in the REAT Account, or designate another entity to manage the long-term maintenance and management fee for CDFG and with CDFG supervision.

g. Interest, Principal, and Pooling of Funds. The Applicant shall ensure that an agreement is in place with the long-term maintenance and management fund (endowment) holder/manager to ensure the following requirements are met:

    i. Interest. Interest generated from the initial capital long-term maintenance and management fund shall be available for reinvestment into the principal and for the long-term operation, management, and protection of the approved compensation lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action that is approved by the BLM AO and is designed to protect or improve the habitat values of the compensation lands.

ii. Withdrawal of Principal. The long-term maintenance and management fund principal shall not be drawn upon unless such withdrawal is deemed necessary by the BLM AO or by the approved third-party long-term maintenance and management fund manager, to ensure the continued viability of the species on the compensation lands.

iii. Pooling Long-Term Maintenance and Management Funds. An entity approved to hold long-term maintenance and management funds for the Project may pool those funds with similar non-wasting funds that it holds from other projects for long-term maintenance and management of compensation lands for special-status plants. However, for reporting purposes, the long-term maintenance and management funds for this Project must be tracked and reported individually to the BLM AO.

h. Other Expenses. In addition to the costs listed above, the Applicant shall be responsible for all other costs related to acquisition of compensation lands and conservation easements, including but not limited to the title and document review costs incurred from other state agency reviews, overhead related to providing compensation lands to CDFG or an approved third party, escrow fees or costs, environmental contaminants clearance, and other site cleanup measures.

i. Mitigation Security. The Applicant shall provide financial assurances in accordance with Mitigation Measure VEG-13 (*Phasing*) to the BLM AO to guarantee that an adequate level of funding is available to implement any of the mitigation measures required by this condition that are not completed prior to the start of ground-disturbing Project activities. Financial assurances shall be provided to the BLM AO in the form of an irrevocable letter of credit, a pledged savings account or another form of approved security ("Security"). The amount of the Security shall be $2,280 per acre, using the estimated cost per acre for Desert Tortoise mitigation as a best available proxy, at a ratio of 3:1 for Rank 1 plants and 2:1 for Rank 2 plants, for every acre of habitat supporting the target special-status plant species which is impacted by the project. The actual costs to comply with this condition will vary depending on the actual costs of acquiring compensation habitat, the costs of initially improving the habitat, and the actual costs of long-term management as determined by a PAR report. Prior to submitting the Security to the BLM AO, the Applicant shall obtain the BLM AO's approval of the form of the Security. The BLM AO may draw on the Security if the BLM AO determines the Applicant has failed to comply with the requirements specified in this condition. The BLM AO may use money from the Security solely for implementation of the requirements of this condition. The BLM AO's use of the Security to implement measures in this condition may not fully satisfy the Applicant's obligations under this condition, and the Applicant remains responsible for satisfying the obligations under this condition if the Security is insufficient. The unused Security shall be returned to the Applicant in whole or in part upon successful completion of the associated requirements in this condition.

j. The Applicant may elect to comply with the requirements in this condition for acquisition of compensation lands, initial protection and habitat improvement on the compensation lands, or long-term maintenance and management of the compensation lands by funding, or any combination of these three requirements, by providing funds to implement those measures into the REAT Account established with the NFWF. To use this option, the Applicant must make an initial deposit to the REAT Account in an amount equal to the estimated costs (as set forth in the Security section of this condition) of implementing the requirement. If the actual cost of the acquisition, initial protection and habitat improvements, or long-term funding is more than the estimated amount initially paid by the Applicant, the Applicant shall make an additional deposit into the REAT Account sufficient to cover the actual acquisition costs, the actual costs of initial protection and habitat improvement on the compensation lands, and the long-term funding requirements as established in an approved PAR or PAR-like analysis. If those actual costs or PAR projections are less than the amount initially transferred by the Applicant, the remaining balance shall be returned to the Applicant.

The responsibility for acquisition of compensation lands may be delegated to a third party other than NFWF, such as a non-governmental organization supportive of desert habitat conservation, by written agreement of the Energy Commission. Such delegation shall be subject to approval by the BLM AO, in consultation with CDFG, BLM, and USFWS, prior to land acquisition, enhancement or management activities. Agreements to delegate land acquisition to an approved third party, or to manage compensation lands, shall be executed and implemented within 18 months of the BLM's certification of the Project.

II. *Compensatory Mitigation by Habitat Enhancement/Restoration*: As an alternative or adjunct to land acquisition for compensatory mitigation the Applicant may undertake habitat enhancement or restoration for the target special-status plant species. Habitat enhancement or restoration activities must achieve protection at a 3:1 ratio for Rank 1 plants and 2:1 for Rank 2 plants, with improvements applied to 3 acres, or 2 acres, respectively, of habitat for every acre of special-status plant habitat directly or indirectly disturbed by the Project Disturbance Area (for example, if the area occupied by the special-status plant collectively measured is 0.25 acre, the improvements would be applied to an area equal to 0.75 acre at a 3:1 ratio, or 0.5 acre at a 2:1 ratio). Examples of suitable enhancement projects include but are not limited to the following: i) control unauthorized vehicle use into an occurrence (or pedestrian use if clearly damaging to the species); ii) control of invasive non-native plants that infest or pose an immediate threat to an occurrence; iii) exclude grazing by wild burros or livestock from an occurrence; or iv) restore lost or degraded hydrologic or geomorphic functions critical to the species by restoring previously diverted flows, removing obstructions to the wind sand transport corridor above an occurrence, or increasing groundwater availability for dependent species.

If the Applicant elects to undertake a habitat enhancement project for mitigation, the project must meet the following performance standards: The proposed enhancement project shall achieve rescue of an off-site occurrence that is currently assessed, based on the NatureServe threat ranking system (Master et al., 2009; see also Morse et al., 2004) with one of the following threat ranks: a) long-term decline >30 percent; b) an immediate threat that affects >30 percent of the population, or c) has an overall threat impact that is High to Very High. "Rescue" would be considered successful if it achieves an improvement in the occurrence trend to "stable" or "increasing" status, or downgrading of the overall threat rank to slight or low (from "High" to "Very High").

If the Applicant elects to undertake a habitat enhancement project for mitigation, they shall submit a Habitat Enhancement/Restoration Plan to the BLM AO for review and approval, and shall provide sufficient funding for implementation and monitoring of the Plan. The amount of the Security shall be $2,280 per acre, using the estimated cost per acre for Desert Tortoise mitigation as a best available proxy, at the ratio of 3:1 for Rank 1 plants and 2:1 for Rank 2 plants, for every acre of habitat supporting the target special-status plant species which is directly or indirectly impacted by the project. The amount of the security may be adjusted based on the actual costs of implementing the enhancement, restoration and monitoring. The implementation and monitoring of the enhancement/restoration may be undertaken by an appropriate third party such as NFWF, subject to approval by the BLM AO. The Habitat Enhancement/Restoration Plan shall include each of the following:

1. *Goals and Objectives*. Define the goals of the restoration or enhancement project and a measurable course of action developed to achieve those goals. The objective of the proposed habitat enhancement plan shall include restoration of a target special-status plant occurrence that is currently threatened with a long-term decline. The proposed enhancement plan shall achieve an improvement in the occurrence trend to "stable" or "increasing" status, or downgrading of the overall threat rank to slight or low (from "High" to "Very High").
2. Historical Conditions. Provide a description of the pre-impact or historical conditions (before the site was degraded by weeds or grazing or ORV, etc.), and the desired conditions.
3. Site Characteristics. Describe other site characteristics relevant to the restoration or enhancement project (e.g., composition of native and pest plants, topography and drainage patterns, soil types, geomorphic and hydrologic processes important to the site or species.
4. Ecological Factors. Describe other important ecological factors of the species being protected, restored, or enhanced such as total population, reproduction, distribution, pollinators, etc.
5. Methods. Describe the restoration methods that will be used (e.g., invasive exotics control, site protection, seedling protection, propagation techniques, etc.) and the long-term maintenance required. The implementation phase of the enhancement must be completed within five years.
6. Budget. Provide a detailed budget and time-line, and develop clear, measurable, objective-driven annual success criteria.
7. Monitoring. Develop clear, measurable monitoring methods that can be used to evaluate the effectiveness of the restoration and the benefit to the affected species. The Plan shall include a minimum of five years of quarterly monitoring, and then annual monitoring for the remainder of the enhancement project, and until the performance standards for rescue of a threatened occurrence are met. At a minimum the progress reports shall include: quantitative measurements of the projects progress in meeting the enhancement project success criteria, detailed description of remedial actions taken or proposed, and contact information for the responsible parties.
8. Reporting Program. The Plan shall ensure accountability with a reporting program that includes progress toward goals and success criteria. Include names of responsible parties.
9. Contingency Plan. Describe the contingency plan for failure to meet annual goals.
10. Long-term Protection. Include proof of long-term protection for the restoration site. For private lands this would include conservations easements or other deed restrictions; projects on public lands must be contained in a Desert Wildlife

Management Area, Wildlife Habitat Management Area, or other land use protections that will protect the mitigation site and target species.

VEG-11: Mitigation for Impacts to Sensitive Riparian Habitat and State Waters. The Applicant shall implement the following measures to avoid, minimize and mitigate for direct and indirect impacts to waters of the state and to satisfy requirements of California Fish and Game Code §§1600 and 1607.

1. ***Acquire Off-Site State Waters*****:** The Applicant shall acquire, in fee or in easement, a parcel or parcels of land that includes at least 215.2 acres of state jurisdictional waters, or comparable area based on actual project impact to jurisdictional features that meets BLM and CDFG mitigation ratios, as identified in APM HYDRO-1 (Table 2-7, *Applicant Proposed Measures*). The parcel or parcels comprising the 215.2 acres of ephemeral washes shall include at least 6 acres of desert dry wash woodland. Under Alternative 2, the mitigation requirement for impacts to riparian habitat and state waters would be a minimum of 63.3 acres that included at least 1.5 acres of desert dry wash woodland. If Alternative 3 were constructed the mitigation requirements for impacts to riparian habitat and state waters would be incrementally greater than under Alternative 1; however, would need to be finalized to include the impacts of road facilities on riparian habitat located on Project linears south of the Project. The terms and conditions of this acquisition or easement shall be as described in Mitigation Measure WIL-4 (*Desert Tortoise Compensatory Mitigation*). Mitigation for impacts to state waters shall occur within the Palo Verde and surrounding watersheds, as close to the Project site as possible. If security is posted in accordance with Provision 2 below (Security for Implementation of Mitigation), the Applicant shall acquire, in fee or in easement, the land, no more than 18 months after the start of Project ground-disturbing activities.

2. ***Security for Implementation of Mitigation*****:** The Applicant shall provide financial assurances to the BLM AO and CDFG to guarantee that an adequate level of funding is available to implement the acquisitions and enhancement of state waters as described in this condition. These funds shall be used solely for implementation of the measures associated with the project. Financial assurance can be provided to the BLM AO and CDFG in the form of an irrevocable letter of credit, a pledged savings account or Security prior to initiating ground-disturbing project activities. Prior to submittal to the BLM AO, the Security shall be approved by the BLM AO, in consultation with CDFG and the USFWS, to ensure funding. An estimate of $485,640 in required Security funds was developed for land costs or the estimated costs of enhancement and endowment (see WIL-4, Compensatory Mitigation for Desert Tortoise Habitat Losses, for a discussion of the assumptions used in calculating the Security) based on an estimate of $2,280 per acre (215.2 acres) to fund acquisition, enhancement and long-term management. For Alternative 2 the Security amounts is estimated to be $144,324. The estimate for Alternative 3 is $485,640, which does not include road impacts on portions of the Central Route or Western Route that deviates from the proposed Project gen-tie line. These this amounts may change based on land costs or the estimated costs of enhancement and endowment. The final amount due will be determined by the PAR analysis conducted pursuant to Mitigation Measure WIL-4 and approved by the BLM AO and CDFG. The final mitigation acreage is also subject to CDFG concurrence with project impacts to waters of the state that were developed by the Applicant.

3. ***Preparation of Management Plan*****:** The Applicant shall submit to the BLM AO and CDFG a draft Management Plan that reflects site-specific enhancement measures for the drainages on the acquired compensation lands. The objective of the Management Plan shall be to

enhance the wildlife value of the drainages, and may include enhancement actions such as weed control, fencing to exclude livestock, or erosion control.

4. ***Code of Regulations*:** The Applicant shall provide a copy of the BRMMP and CDFG permits to all contractors, subcontractors, and the Applicant's Project supervisors. Copies shall be readily available at work sites at all times during periods of active work and must be presented to any CDFG personnel upon demand. The BLM AO reserves the right to issue a stop work order or allow CDFG to issue a stop work order after giving notice to the Applicant. If the BLM AO in consultation with CDFG, determines that the Applicant has breached any of the terms or conditions or for other reasons, including but not limited to the following:

    a. The information provided by the Applicant regarding streambed alteration is incomplete or inaccurate;

    b. New information becomes available that was not known to it in preparing the terms and conditions; or

    c. The Project or Project activities as described in the Staff Assessment have changed.

5. Best Management Practices: The Applicant shall also comply with the following conditions to protect drainages near the Project Disturbance Area:

    a. The Applicant shall minimize road building, construction activities and vegetation clearing within ephemeral drainages to the extent feasible.

    b. The Applicant shall not allow water containing mud, silt, or other pollutants from grading, aggregate washing, or other activities to enter ephemeral drainages or be placed in locations that may be subjected to high storm flows.

    c. The Applicant shall comply with all litter and pollution laws. All contractors, subcontractors, and employees shall also obey these laws, and it shall be the responsibility of the Applicant to ensure compliance.

    d. Spoil sites shall not be located at least 30 feet from the boundaries and drainages or in locations that may be subjected to high storm flows, where spoils might be washed back into drainages.

    e. Raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to vegetation or wildlife resources, resulting from Project-related activities, shall be prevented from contaminating the soil and/or entering waters of the state. These materials, placed within or where they may enter a drainage by the Applicant or any party working under contract or with the permission of the Applicant, shall be removed immediately.

    f. No broken concrete, debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete or washings thereof, oil or petroleum products or other organic or earthen material from any construction or associated activity of whatever nature shall be allowed to enter into, or placed where it may be washed by rainfall or runoff into, waters of the state.

    g. When operations are completed, any excess materials or debris shall be removed from the work area. No rubbish shall be deposited within 150 feet of the high water mark of any drainage.

h. No equipment maintenance shall occur within 150 feet of any ephemeral drainage where petroleum products or other pollutants from the equipment may enter these areas under any flow.

VEG-12: Channel Decommissioning and Reclamation Plan. At least 12 months prior to Project closure, the Applicant shall prepare a draft Decommissioning and Reclamation Plan to remove the engineered diversion channels from the Project site, and implement the final plan upon site closure. The goal of the plan shall be to restore the site's topography and hydrology to a relatively natural condition and to establish native plant communities within the Project Disturbance Area. The Channel Decommissioning and Reclamation Plan shall include a cost estimate for implementing the proposed decommissioning and reclamation activities, and shall be consistent with the guidelines in BLM's 43 CFR 3809.550 et seq., subject to review and revisions from the BLM AO in consultation with USFWS and CDFG.

VEG-13: Phasing. The Applicant shall provide compensatory mitigation for the total Project Disturbance Area and may provide such mitigation in multiple phases for distinct construction elements (e.g., Unit 1, Unit 2, etc.). These phases will generally include installation of fencing, clearing, grubbing and grading, and development of common facilities first, followed by the remaining power block units. All construction activities for the non-linear features during these subsequent phases will occur within desert tortoise exclusionary fenced areas that have been cleared in accordance with USFWS protocols.

Prior to initiating each phase of construction the Applicant shall submit the actual construction schedule, a figure depicting the locations of proposed construction and amount of acres to be disturbed. Mitigation acres are calculated based on the compensation requirements for each resource type including desert tortoise (Mitigation Measure WIL-4), western burrowing owl (Mitigation Measure WIL-9), Mojave fringe-toed lizard (Mitigation Measure WIL-10), and state waters (Mitigation Measure VEG-11). Compensatory mitigation for each phase shall be implemented according to the timing required by each condition.

4.3.9 Residual Impacts after Mitigation Incorporated

The Proposed Action and the two action alternatives would cause substantial impacts to vegetation resources, eliminating all of the Sonoran creosote bush scrub and other native plant and wildlife communities within the disturbance area of Alternatives 2 and 3. The Project also would directly and indirectly affect an extensive network of desert washes comprising approximately 165.2 acres of vegetated ephemeral streams and unvegetated ephemeral dry washes, and 4.2 acres of desert dry wash woodland, which are regulated as state-jurisdictional ephemeral drainages. Alternatives 1 and 3 would impact vegetation resources on the more biologically diverse west side of the Study Area, which would be avoided under Alternative 2. As discussed in the sections above, the recommended avoidance and minimization measures as well as compensatory mitigation would effectively offset direct, indirect, and cumulative impacts in varying, but unquantified degrees and assure compliance with state and federal laws. It is expected that some residual adverse effects would remain after mitigation measures have been applied, including net losses in waters of the state and vegetation resources.

4.4 Biological Resources – Wildlife

4.4.1 Methodology for Analysis

This analysis of potential impacts of the Proposed Action and Alternatives to wildlife resources relies on a literature review, biological reconnaissance survey, focused wildlife surveys and coordination with appropriate permitting agencies including the USFWS and CDFG. A literature review was conducted to determine the federal and state-listed endangered, threatened, and special-status wildlife species that have the potential to occur within the Project vicinity. The literature review also included a search of the CNDDB Electronic Inventory for the nine USGS 7.5' topographic quadrangles that surround the Project. As discussed in Section 3.4, focused wildlife surveys were conducted for desert tortoise, Couch's spadefoot toad, burrowing owl, golden eagle (nest survey), and avian species (i.e., avian point counts), and are summarized in the following Project-specific documents:

1. Tetra Tech EC, Inc. and A. Karl, 2011a. *Biological Resources Technical Report, McCoy Solar Energy Project, Riverside County, CA*. Prepared for McCoy Solar, LLC, August 2011 (see Appendix C-1).

2. Tetra Tech EC, Inc. and A. Karl, 2011b. *Fall 2011 Plants and Supplemental Wildlife Survey Report, McCoy Solar Energy Project, Riverside County, CA*. Prepared for McCoy Solar, LLC, December 2011 (see Appendix C-2).

3. Tetra Tech EC, Inc., 2011. *Golden Eagle Risk Assessment, McCoy Solar Energy Project, Riverside County, CA*, August, 2011 (see Appendix C-3).

4. Tetra Tech EC, Inc., 2012a. McCoy Solar Energy Project Response to Data Request, January 11, 2012.

5. Tetra Tech EC, Inc. and A. Karl, 2012. *Winter 2011-2012 Avian Point Count Survey Report, McCoy Solar Energy Project, Riverside County, CA*, March, 2012 (see Appendix C-4).

6. Tetra Tech EC, Inc., 2012b. *Couch's Spadefoot Breeding Season Surveys near Blythe, CA for the McCoy Solar Energy Project*. Technical Memorandum, December 3, 2012.

This section analyzes potential direct, indirect, and cumulative impacts to wildlife resources from construction, operation and maintenance, and decommissioning of the Proposed Action and Alternatives. Direct impacts are those resulting from the Project and occur at the same time and place. Indirect impacts are caused by the Project, but can occur later in time or farther removed in distance while still reasonably foreseeable and related to the Proposed Action.

Wildlife impact analyses typically characterize effects as temporary or permanent, with a permanent impact referring to areas that are paved or otherwise precluded from restoration to a pre-project state within a relatively brief time frame (e.g., within one season of initial disturbance). In desert ecosystems, the definition of permanent impacts must reflect the slow recovery rates of vegetation communities. For the purposes of this analysis and following CDFG guidance, all ground disturbance activity is considered a permanent impact due to the long time period for natural revegetation to occur in the desert.

The analysis and environmental protection measures presented in this PA/FEIS were reviewed to provide consistency with approved mitigation measures that were presented in Appendices D through G of the NECO Plan/FEIS relating to desert tortoise, desert restoration, public education, and limitations on cumulative new surface disturbance (BLM, 2002). All practicable measures to avoid or minimize environmental harm by the plan have been adopted.

4.4.2 Applicant Proposed Measures

The following APMs were developed by the Applicant to address potential effects to wildlife resources. These measures generally were intended to avoid or reduce potential direct and indirect Project impacts to wildlife resources, and desert tortoise in particular. APMs related to Project impacts to wildlife resources are listed below. The impact analysis assumes that the applicable APMs would be applied as part of the Project; additional agency identified mitigation measures are identified later in this section.

BIO-1: Desert Tortoise-specific Protection Measures During Construction.

a. ***Environmental Compliance Personnel*****:** Environmental compliance personnel shall be employed to oversee the implementation of all desert tortoise protection measures in accordance with a BO. An ECM will be assigned to the Project who shall be an on-site staff member of the Project. The ECM will be responsible for facilitating implementation of the environmental conditions of the Project and for coordinating compliance with the BLM and USFWS. A Project Lead Biologist and alternate Lead Biologists with demonstrated expertise with desert tortoise shall oversee compliance with the protection measures for the desert tortoise and other special-status species. There also shall be ABs that have demonstrated expertise to conduct specific activities for desert tortoise protection; the Lead Biologist also will be an AB. Additionally, qualified BMs will assist the AB in enforcing APMs. McCoy Solar shall submit the names and qualifications of the proposed Lead Biologist(s) and all ABs to the USFWS and BLM for review and approval prior to pre-construction clearance surveys. Project activities involving ground disturbance shall not begin until the Lead Biologist and ABs are approved by the aforementioned agencies. Replacement of Lead Biologist and ABs would require USFWS and BLM approval. The ECM, ABs, and BMs shall have the authority to halt all non-emergency activities that are in violation of the protection measures, or if a desert tortoise wanders into a work site. Work will proceed only after hazards to the desert tortoise are removed, the species no longer is at risk, or the animal has been moved from harm's way by the AB. The ABs will document any incident occurring during Project activities which is in non-compliance with the protection measures stated in the BO. The Lead Biologist and ECM shall ensure that appropriate corrective action is taken. Corrective actions shall be documented by the AB or BM. The following incidents shall require immediate cessation of the Project activities causing the incident:

    1. Imminent threat of injury or death to a desert tortoise.
    2. Unauthorized handling of a desert tortoise.
    3. Operation of construction equipment or vehicles outside of areas secured with desert tortoise fencing without a BM present, except on designated roads.
    4. Conducting any construction activity without an AB or BM present where one is required.

b. ***Desert Tortoise Exclusion Fencing*:** Prior to the onset of ground disturbing activities, the entire solar plant site will be fenced with a permanent tortoise exclusion fence per current USFWS requirements (USFWS, 2009) to keep tortoises from entering the solar plant site during construction and operation phases. The fencing type will be 1-inch by 2-inch vertical mesh galvanized fence material, extending at least 2 feet above the ground and buried at least 1 foot. Where burial is impossible, the mesh will be bent at a right angle toward the outside of the fence and covered with dirt, rocks, or gravel to prevent tortoises from digging under the fence. Tortoise-proof gates will be established at all site entry points. Fence construction may be completed during any time of the year (USFWS, 2010). As necessary, linear facilities (e.g., gen-tie line and switchyard) will be temporarily fenced to prevent tortoise entry during construction. Alternatively, monitoring during construction can be used to protect tortoises instead of temporary fencing. Temporary fencing will follow current USFWS guidelines for permanent fencing and supporting stakes will be sufficiently spaced to maintain fence integrity; burial may be minimized to avoid surface disturbance. All fence construction will be monitored by an AB or BMs to ensure that no desert tortoises are harmed. Following installation, all permanent exclusion fencing will be inspected monthly and during all major rainfall events; temporary fencing will be inspected at least weekly, or more often as necessary. Any damage to the fencing will be repaired immediately. All fencing erected during a tortoise activity period or prior to tortoises exiting brumation will be inspected at least three times each day for a minimum of 2 weeks (or for a minimum of two weeks after tortoises become active following brumation), to search for any tortoises that might be fence-walking; at least one search will occur immediately prior to lethal ambient temperatures.

c. ***Pre-Construction Clearance Surveys*:** Within 1 week prior to fence installation, the AB and/or approved BMs will survey the staked fence line location for all desert tortoise burrows and tortoises, covering a swath of at least 90 feet centered on the fence line, using 15-foot-wide transects. All potential desert tortoise burrows or pallets will be searched. Burrows along the fence line that must be disturbed will be excavated by ABs or approved BMs using hand tools. Tortoise burrows will be mapped using GPS, and the size and age identified. Where flagging would not attract poaching, burrows will also be flagged. All fence construction then will be monitored by BMs. A clearance survey for tortoises will be conducted inside all fenced areas. Consistent with the McCoy Desert Tortoise Translocation Plan (BIO-1[d]), a minimum of two consecutive clearance passes without finding any new tortoises must be completed and these must coincide with heightened tortoise activity from mid-March through May and September through early November, or as otherwise agreed to by BLM and USFWS. This will maximize the probability of finding all tortoises. Clearance transects will be a maximum of 15 feet (5 meters) apart per USFWS approved protocols (USFWS, 2009), except on broad patches of unvegetated, well-developed desert pavement, where the width may be increased to a maximum of 30 feet (9 meters) upon USFWS approval. Once the solar plant site is deemed free of tortoises, heavy equipment will be allowed to enter the site to perform construction activities. It is anticipated that very few tortoises will be found during clearance or monitoring activities, but if tortoises are observed, the biologists will implement the McCoy Desert Tortoise Translocation Plan. The AB and BMs also will conduct clearance surveys of construction areas outside of the solar plant site. Burrows will be avoided if at all possible (especially if this is temporary fencing). However, if a burrow must be destroyed for fencing to occur, then it will be visually and tactilely examined for occupancy by tortoises and other wildlife. If occupancy is negative or cannot be established, the burrow will be carefully excavated with hand tools, using standardized techniques approved by USFWS (2009) and the Desert Tortoise Council (1994), including disinfection techniques for all tools. No burrows that can be avoided will be collapsed during perimeter fence construction. Other tortoise burrows will be flagged judiciously to avoid attraction of tortoise predators or people to the burrow. All BMs, the AB, and relevant construction personnel will be informed of all potential tortoise activity adjacent to an unfenced construction area. Following Project area clearance, a report will be prepared by the Project Lead Biologist to document the clearance surveys, the capture and release locations of all desert tortoises found, post-release monitoring, individual tortoise data, and other relevant data, consistent with the McCoy Desert Tortoise Translocation Plan. This report will be submitted to the BLM and USFWS.

d. ***Desert Tortoise Translocation Plan*:** The Applicant will prepare and implement a Desert Tortoise Translocation Plan that will be approved by USFWS prior to construction.

e. ***Construction Monitoring*:** No construction will occur in unfenced areas (see BIO-1[b], *Desert Tortoise Exclusion Fencing*) or on the linear facilities without BMs present. This includes both the construction phase (construction, revegetation) and maintenance activities during the operations phase that require new surface disturbance. An adequate number of trained and experienced monitors must be present during all construction activities in unfenced areas, depending on the various construction tasks, locations, and season.

f. ***Dead, Injured, and Sick Desert Tortoises*:** The Lead Biologist will notify the BLM and USFWS immediately if a dead or injured desert tortoise is observed. Written notification must be made within 2 days of the date of the finding or incident (if known) and must include: Location of the tortoise, photographs, cause of death (if known), and other pertinent information. The AB will ensure that all tortoises injured by Project activities receive prompt veterinary care at the Applicant's expense. If an injured animal recovers, the BLM and USFWS will be contacted by the Applicant for final disposition of the animal. However, if efforts to keep the injured animal separate from other tortoises and turtles are successful during the tortoise's treatment, then it is recommended that it be released at or near its capture point to continue to contribute to the persistence of the local tortoise population. Tortoises fatally injured or killed from Project-related activities will be submitted for necropsy as outlined in Salvaging Injured, Recently Dead, Ill, and Dying Wild, Free-Roaming Desert Tortoises (*Gopherus agassizii*) (Berry, 2001) at the Applicant's expense. Care will be taken by the AB in handling dead specimens to preserve biological material in the best possible state.

BIO-2: General Protection Measures During Construction.

a. ***Biological Resources Mitigation and Monitoring Plan (BRMMP)*:** The BRMMP will outline steps to implement the protection measures; document their implementation; and monitor their effectiveness. The BRMMP will identify the terms and conditions of any permits associated with the Project, including, but not limited to, the USFWS §7 Biological Opinion, CDFG §2081 Incidental Take Permit, and CDFG Streambed Alteration Agreement. The BRMMP will be submitted to the BLM and USFWS for approval prior to the start of ground disturbance.

b. ***Reporting*:** As part of implementing protection measures, regular reports will be submitted to the relevant resource agencies to document the Project activities, mitigation implemented and mitigation effectiveness, and provide recommendations as needed. A schedule of reporting will be specific to individual plans. However, the Lead Biologist will submit monthly reports to the ECM during construction, annual comprehensive reports, and special-incident reports. The Lead Biologist will be responsible for reviewing and signing reports prior to submittal to the agencies. In addition to a regular reporting schedule, all encounters with desert tortoises will be reported to the Lead Biologist, who will report the following information in Monthly and Annual Reports:

1. Location (narrative and maps) and dates of observations;
2. General condition and health, including injuries and state of healing;
3. Diagnostic markings, including identification numbers or markers; and
4. Disposition (if moved).

c. ***Worker Environmental Training*:** The Applicant will prepare and implement site-specific Worker Environmental Training to inform Project personnel about the biological constraints of the Project. The training will be included in the BRMMP and will be developed and presented by a qualified Project biologist prior to the commencement of construction activity. All Project personnel must attend the training. The training will include information regarding the sensitive biological resources, restrictions, protection measures, and individual responsibilities associated with the Project. Special emphasis will be placed on protection measures developed for the desert tortoise and the consequences of non-compliance. Written material will be provided to employees at orientation and participants will sign an attendance sheet documenting their participation.

d. ***Construction-related Activities*:** Existing roads will be utilized wherever possible to avoid unnecessary impacts. New and existing roads that are planned for either construction or widening will not extend beyond the planned impact area and will minimize surface disturbance in native habitats, where practical. All vehicles passing or turning around will do so within the planned impact area or in previously disturbed areas. Along the linear facilities, the anticipated impact zones, including staging areas, equipment access, and disposal or temporary placement of spoils, will be delineated with stakes and/or flagging prior to construction to avoid natural resources, where possible. Outside the Project boundaries, personnel will utilize established roadways (paved or unpaved) for traveling to and from the Project Area, including for transmission line construction. No work in unfenced and uncleared habitat will occur except under the direct supervision of a BM. Cross-country vehicle and equipment use outside designated work areas will be prohibited. Best Management Practices will be employed to prevent loss of habitat due to erosion caused by Project-related impacts (i.e., grading or clearing for new roads). All detected erosion will be remedied within 2 days of discovery. Additionally, fueling of equipment will take place within existing paved or contained areas and not within or adjacent to drainages or native desert habitats. Contractor equipment will be checked for leaks prior to operation and repaired as necessary. All vehicles and equipment will be in proper working condition to minimize the potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. The AB and BM will be informed of any hazardous spills within 24 hours. Hazardous spills will be immediately cleaned up and the contaminated soil will be properly disposed of at a licensed facility. Employees and contractors will look under vehicles and equipment for the presence of desert tortoises prior to movement. No equipment will be moved until the animal has left voluntarily or an AB removes it.

e. ***Construction Speed Limits*:** To minimize the likelihood for vehicle strikes of tortoises and other species during construction, a speed limit of 25 miles per hour will be established for travel on all dirt Project access roads. Signs will be posted at appropriate locations (for example, at Arizona crossings of drainages) to remind drivers to be aware of the potential for desert tortoise and other wildlife occurring on the roadways.

f. ***Ground Excavations*:** The Applicant will ensure that Project features located outside the permanently fenced sites, such as open trenches, pits, bores and other excavations that might trap, entangle, or constitute as pitfalls to desert tortoises and other wildlife, be filled in, fenced, covered, or otherwise modified at the end of each work day so they are no longer a hazard to desert tortoises and other wildlife. All excavations in tortoise habitat outside the permanently fenced sites will be inspected for trapped desert tortoises at the beginning, middle, and end of the work day, at a minimum, but also will be continuously monitored by BMs as part of monitoring construction outside of fenced areas. Should a tortoise become entrapped, the AB will remove it immediately. These Project features will not need to be inspected if they are located within the permanently fenced solar plant site after the clearance surveys have been completed. However, any such Project features inside temporarily fenced locations that have been cleared of tortoises will be inspected daily for other wildlife.

g. ***Construction Material Storage*:** The Applicant will ensure that any construction pipe, culvert, or similar structure stored less than 8 inches above the ground, stored for one or more nights, and within desert tortoise habitat outside the permanently fenced sites, will be inspected for tortoises before the material is moved, buried or capped. As an alternative, all such structures may be capped before being stored on the construction site or placed on pipe racks. These materials will not need to be inspected or capped if they are stored within the permanently fenced solar plant site after the clearance surveys have been completed or inside temporarily fenced locations.

h. ***Hazardous Materials*:** The Applicant will ensure all vehicles and equipment are in proper working condition to ensure that there is no potential for fugitive emissions of motor oil, fuel, antifreeze, hydraulic fluid, grease, or other hazardous materials. Contractor equipment will be checked for leaks prior to operation and repaired as necessary. Fueling of equipment will take place within existing paved roads, where possible, and not within or adjacent to drainages. Hazardous spills will be immediately cleaned up and the contaminated soil will be properly disposed of at a licensed facility. The ECM, Lead Biologist, and BLM will be informed of any significant hazardous spills within 24 hours.

i. ***Trash Abatement*:** Trash and food items will be contained in secure, closed lid (raven- and coyote-proof) containers. Trash will be removed regularly (at least once a week) to reduce the attractiveness to the site to opportunistic tortoise predators such as common ravens (*Corvus corax*) and coyotes (*Canis latrans*) and to reduce the possibility of animals ingesting or becoming entangled in foreign matter.

j. ***Roadkill Removal*:** To preclude providing food to scavengers, including potential tortoise predators, such as ravens and coyotes, all road kills on construction entry roads will be collected, bagged, and put in a secure trash bin, daily. All personnel will be required to report road kills to a BM or AB daily, to ensure timely removal.

k. ***Pets and Firearms*:** The Applicant will prohibit workers from bringing pets or firearms to the Project.

l. ***Plant and Wildlife Collection*:** The Applicant will prohibit the intentional killing or collection of all native plant or native wildlife species, including, but not limited to desert tortoise. Workers will not disturb, capture, handle, or move animals, or their nests/burrows. Violations will be reported in the monthly and annual reports.

m. ***Raven Management*:** The Applicant will provide funds to the USFWS' range-wide raven monitoring and control program to support the more comprehensive goals of that program. These funds will be in lieu of extensive quantitative monitoring at the Project site. The amount will be determined through negotiation with USFWS. In addition, a Raven Management Plan will be designed and implemented to identify the conditions of concern specific to the Project that may attract ravens to the Project and to define a plan that will

1) monitor raven activity and 2) specify management and control measures. The monitoring effort is intended to provide qualitative and semi-quantitative data to ensure that ravens do not pose a threat to desert tortoises from the Project.

n. ***Weed Management Plan*:** The Applicant will prepare and implement a Weed Management Plan to prevent the spread of existing weeds and the introduction of new weeds to the Project Area.

o. ***Water Application for Dust Control*:** The Applicant will ensure water is applied to the construction area, dirt roads, trenches, spoil piles, and other areas where ground disturbance has taken place to minimize dust emissions and topsoil erosion. A BM will patrol these areas to ensure water does not pool for long periods of time and potentially attract desert tortoises, common ravens, and other wildlife.

p. ***Cleanup and Restoration; Revegetation Plan*:** The Applicant will ensure that all unused material and equipment will be removed upon completion of construction activities or maintenance activities conducted outside the permanently fenced sites (this includes non-emergency and emergency repairs). Upon completion, all construction equipment and refuse, including, but not limited to wrapping material, cables, cords, wire, boxes, rope, broken equipment parts, twine, strapping, buckets, metal or plastic containers will be removed from the site and disposed of properly. Any unused or leftover hazardous products will be properly disposed of offsite. The Applicant will prepare and implement a Revegetation Plan to restore temporarily disturbed areas.

BIO-3: Protection Measures During Operation and Maintenance. Road, transmission line, and pipeline maintenance activities are expected to occur during the life of the Project. To the extent possible, major road surface maintenance activities outside the solar plant site will be scheduled for the season with the least desert tortoise activity (typically November 1 through February 28), unless accompanied by an AB. During operation, all personnel who encounter a desert tortoise will immediately report the encounter to the ECM. An AB will monitor all major maintenance activities; minor maintenance (e.g., inspections) does not have to be accompanied by an AB. Only an AB may move tortoises during the operations phase and only if necessary. If feasible, all tortoises will be allowed to move into a safe area of their own accord. In order to prevent roadkills, any tortoise observed on the Project access road will be watched until it is safely off the road before the personnel can continue. If a desert tortoise is found inside the fenced solar plant site, an AB will be contacted immediately to translocate the desert tortoise from the solar plant site; in the interim, the tortoise will be captured, enclosed in a clean cardboard box with a lid, and held in a climate controlled situation until translocation by an AB, in accordance with details described in the McCoy Desert Tortoise Translocation Plan (BIO-1[d]). The ECM or AB will document the location (narrative and maps), date of observations, general condition and health (if known), including injuries and state of healing; diagnostic markings, including identification numbers or markers; and disposition, in the annual report.

BIO-4: Desert Tortoise Compensation. To fully mitigate for habitat loss and potential take of desert tortoise, the Applicant will provide compensatory mitigation at a 1:1 ratio for impacts to all Category 3 desert tortoise habitat in accordance with the NECO Plan (BLM, 2002). Approximately 4,500 acres of Category 3 habitat would be disturbed). This excludes 38 acres of sand dunes, agricultural areas, and areas that are currently developed or disturbed along the access road. Acreage of disturbance was based on the best available Project plans and would be adjusted, based on pre- and post-construction aerial photography, to reflect the final Project disturbance footprint. Because the construction of Unit 1, Unit 2, and the linear facilities would be phased, compensation obligations (e.g., security deposits and the actual funding or acquisition of mitigation land) should be apportioned as follows:

a. Unit 1: 2,259 acres at a 1:1 ratio;
b. Unit 2: 2,178 acres at a 1:1 ratio; and
c. Linear facilities: 106 acres at a 1:1 ratio.

The following qualitative criteria would be used to select compensation lands to ensure that they provide mitigation for the incidental take of desert tortoises:

a. Compensation lands should be part of a larger block of lands that are either already protected or planned for protection, or feasibly could be protected by a public resource agency or a private biological reserve organization.

b. Parcels should provide habitat that is as good as or better than the habitat being impacted by the Project. Preferably, the lands would comprise sufficiently good habitat that they are either currently occupied or could be occupied by the desert tortoise once they are protected from anthropogenic impacts and/or otherwise enhanced.

c. Parcels should not be subject to such intensive recreational, grazing, or other uses that recovery is rendered unlikely or lengthy. Nor should those invasive species that are likely to jeopardize habitat recovery (e.g., Sahara mustard [*Brassica tournefortii*]) be present in uncontrollable numbers, either on or immediately adjacent to the parcels under consideration.

d. The parcels should be connected to occupied desert tortoise habitat or in sufficiently close proximity to known occupied tortoise habitat such that an unencumbered genetic flow is possible. Preferably, the existing populations of desert tortoise on these lands would represent populations that are stable, recovering, or likely to recover.

e. The parcels should be consistent with the goals, objectives, and recovery actions of an accepted recovery strategy (e.g., recovery plan) for the desert tortoise if possible.

BIO-5: Protection Measures during Decommissioning/Closure: Project Decommissioning: The planned operating life of the Project is 30 years. In the event the Project permanently shuts down, and no other project will occupy the same industrial space, the Applicant will prepare and implement a Decommissioning Plan to ensure that the environment is protected during the decommissioning phase. Prior to decommissioning, a plan will be finalized and approved by the BLM. The Applicant shall retain an AB for the decommissioning phase of the Project to ensure that all environmental protection measures are implemented. The Applicant will submit the names and qualifications of all proposed biologists to the USFWS and BLM for review and approval at least 30 days prior to decommissioning activities and prior to initiation of any tortoise handling. Decommissioning activities will not begin until the ABs are approved by the aforementioned agencies.

4.4.3 Alternative 1: Proposed Action

A summary of the overall acreages of disturbance associated with each Alternative is provided in Table 4.4-1. Acreages calculated for impacts were based on the best information available at the time of publication of the PA/FEIS for permanent and temporary disturbance areas. For the gen-tie line and distribution line, temporary disturbances would be associated with string pulling sites and construction around poles. Some vegetation in temporarily disturbed areas (e.g., the string pulling sites) would be crushed by equipment, but these areas would not be otherwise disturbed. Permanent impacts outside of the solar plant site would be caused by transmission pole and tower footprints, permanent access roads, and the 230 kV switchyard. All ground-disturbing activities within the solar plant site are assumed to be permanent in this analysis, including temporary laydown areas that would be converted to solar fields following construction.

TABLE 4.4-1
SUMMARY OF PERMANENT AND TEMPORARY HABITAT DISTURBANCE

Project Component	Project Alternative Disturbance Area (Acres) (Permanent/Temporary)			
	Alternative 1	Alternative 2	Alternative 3 Central Route	Alternative 3 Western Route
Solar Plant Site Unit 1 and Ancillary Facilities	2,259 / 0.0	2,259 / 0.0	--	--
Solar Plant Site Unit 2 and Ancillary Facilities	2,178 / 0.0	--	--	--
Gen-Tie Line, Access Road, and 230 kV Switchyard	53.5 / 50.3	--	94.3 / 0.0	148.7 / 0.0
String Pulling Sites	0.0 / 34.5	--	0.0 / 34.5	0.0 / 34.5
Distribution Line	5.5 / 1.9	5.5 / 1.9	--	--
Total Disturbance Acreage	**4,496 / 86.7**	**2,264.5 / 1.9**	**94.3 / 34.5**	**148.7 / 34.5**

SOURCE: Tetra Tech EC, Inc. and Karl, 2011a; 2011b; Tetra Tech EC, Inc. 2012a, 2012c

Table 4.4-2 summarizes the special-status wildlife species that either have been observed to occur in the study area for the Project or alternatives, or are expected to occur based upon the presence of suitable habitat and known species ranges. Creosote bush scrub and desert dry wash woodlands on the Project site provide habitat for each of the species listed in Table 4.4-2; with the exception of Mojave fringe-toed lizard, which has narrow distribution in areas south of I-10. Also, potential roosting habitat for pallid bat and California leaf-nosed bat is restricted to a single location on the solar plant site. The habitat requirements for each species is described in detail in Section 3.4.

The potential direct and indirect impacts of each action alternative on wildlife are discussed in Sections 4.4.3 to 4.4.5. Direct impacts on wildlife are considered to include injury or death to an individual, habitat loss or degradation, adverse effects on movement, increased predation, and disturbance from noise, light, or dust. Examples of potential indirect impacts include habitat degradation through the introduction of invasive species, or increased predation due to site conditions during the operation and maintenance phase of the Project.

TABLE 4.4-2
POTENTIAL FOR SPECIAL-STATUS WILDLIFE SPECIES TO OCCUR ON THE PROJECT SITE

Species	Project Alternative		
	Alternative 1	**Alternative 2**	**Alternative 3 (Central and Western)**
Reptiles			
Desert tortoise	C	C	C
Mojave fringe-toed lizard	C	C	C
Amphibians			
Couch's spadefoot toad	P	P	P
Birds			
Burrowing owl	C	C	C
Golden eagle	P (foraging only)	P (foraging only)	P (foraging only)
Swainson's hawk	C (non-breeding)	C (non-breeding)	C (non-breeding)
Vaux's swift	C	C	C
Northern harrier	P (foraging only)	P (foraging only)	P (foraging only)
Yellow warbler	C (non-breeding)	C (non-breeding)	P (non-breeding
Prairie falcon	P (foraging only)	P (foraging only)	P (foraging only)
American peregrine falcon	P (foraging only)	P (foraging only)	P (foraging only)
Loggerhead shrike	C	C	C
Le Conte's thrasher	C	P	P
Black-tailed gnatcatcher	C	P	P
California horned lark	C	P	P
Mammals			
Pallid bat	P	P	P
California leaf-nosed bat	P	P	P
American badger	C	P	P
Desert kit fox	C	C	C
Nelson's bighorn sheep	U	U	U
Burro deer	P	P	P

Key to species potential for occurrence: U = Unlikely; P = Potential; C = Confirmed; N/I = No Impact

SOURCE: Tetra Tech EC, Inc. and Karl, 2011a; 2011b; Tetra Tech EC, Inc., 2012b

4.4.3.1 Direct and Indirect Impacts

Construction

Wildlife Habitat

The permanent and temporary removal of habitat under Alternative 1 would have a direct effect on wildlife species through habitat loss (see below for separate discussions of impacts on special-status wildlife species and wildlife movement and breeding). Impacts include the permanent removal of 4,437 acres of habitat on the solar plant site (Table 4.4-1). An additional 59.0 acres of habitat would be permanently impacted and 87 acres temporarily impacted by construction of the gen-tie line, access road, 230 kV switchyard, and distribution line. In addition to disturbance-related impacts, the exclusion fence that would preclude most terrestrial wildlife species from using the solar plant site would encompass approximately 4,437 acres.

Construction of the Project would increase noise, night lighting, and fugitive dust that could disturb common and special-status wildlife species near the construction area. Many species are sensitive to visual and noise disturbances that could cause wildlife to alter foraging and/or breeding behavior and avoid suitable habitat in adjacent areas. Night lighting also could attract wildlife to the site, disrupting their normal pattern of behavior. During construction, nighttime task lighting would be used only as necessary. In addition, implementation of dust control mitigation measures discussed in Section 4.2, *Air Resources*, would reduce impacts associated with dust.

As discussed in Section 4.3, *Biological Resources - Vegetation*, Project construction also has the potential to introduce invasive plant species outside of the Project site, which could result in the degradation of wildlife habitat outside of the solar plant site and linear corridors.

Desert Tortoise

Direct Impacts. Signs of desert tortoise were found throughout the Project solar plant site and within the linear corridors (Figure 3.4-2). The Project would have a direct and permanent impact to 4,437 acres of suitable desert tortoise habitat within the solar plant site fence, including 2,259 for Unit 1 and 2,178 for Unit 2, as well as to 59 acres outside of the solar plant site associated with the gen-tie line, access road, switchyard, and distribution line (Tetra Tech EC, Inc. and Karl, 2011a). Areas south of I-10 are sandier and provide less favorable habitat for tortoises (Tetra Tech EC and Karl, 2011a). Thus, the total area of permanent direct desert tortoise habitat loss in the Project disturbance area is approximately 4,496 acres.

Using the USFWS population estimate methodology, Tetra Tech EC, Inc. and A. Karl (2011a) estimated a desert tortoise population of 3.6 tortoises for the combined solar plant site and linear corridor (range = 0.4 to 31.4). Direct effects could include individual tortoises being crushed or entombed in their burrows, collection or vandalism, disruption of tortoise behavior during construction or operation of facilities, disturbance by noise or vibrations from the heavy equipment, and injury or mortality from encounters with workers' or visitors' pets. Desert tortoises also could be attracted to the construction area by application of water to control dust, placing them at higher risk of injury or mortality. Increased human activity and vehicle travel would occur from the construction and improvement of access roads, which could disturb, injure, or kill individual tortoises. Also, tortoises could seek shade and thermal cover by taking shelter under parked vehicles and be killed, injured, or harassed when the vehicle is moved.

Indirect Impacts. Foraging opportunities for common raven, kit fox, coyote and other predators would temporarily increase on the Project site during construction. Construction activities are expected to provide food for scavengers and opportunistic feeders. Potential sources of increased predator base include inappropriately discarded food trash, increases in equipment-related wildlife mortality, and the availability of water sources, which tend to draw species that prey on desert tortoise.

Common raven populations in some areas of the Mojave Desert have increased over 1,000 percent from 1968 to 1988 in response to expanding human use of the desert, largely as a result of human-caused land alterations that have increased and stabilized food, water, and nesting site availability to ravens (Boarman, 2002; Boarman and Berry, 1995). Project construction, operation, and maintenance could temporarily increase raven and coyote presence in the Project area.

Ravens capitalize on human encroachment and expand into areas where they previously were absent or in low abundance. Ravens habituate to human activities and are subsidized by the food and water, as well as roosting and nesting resources, that are introduced or augmented by human encroachment. The City of Blythe and the nearby airport provide food, water features, and roosting/nesting substrates (buildings, signs, lamps, and utility poles) that otherwise would be unavailable. This development near the Project provides year-round water and trash subsidies for the raven as well as nesting opportunities.

It is anticipated that the existing baseline level of wildlife road kills would increase with Project construction and operation traffic, providing an additional food source that could exacerbate the raven/predator attraction and potentially increase predation pressure on desert tortoise. Increased vehicle traffic on access roads during the construction period could also increase the risk of tortoise mortality. The potential for increased traffic-related tortoise mortality is greatest along paved roads where vehicle frequency and speed is greatest though tortoises on dirt roads also could be affected depending on vehicle frequency, speed, and driver attentiveness. Additional unauthorized impacts could occur from casual use of access roads due to unauthorized off-road activities.

The capture, handling, and relocation of desert tortoises from the Project site following the installation of perimeter wildlife exclusion fencing could result in the harassment and mortality of juvenile and adult desert tortoises during relocation. Based on 2010 and 2011 field survey findings, local tortoise densities were estimated to be 0.2 adults per square mile, for an estimate of 2 adult tortoises on the Project site. Thus, it is estimated that several juvenile and/or adult tortoises could be relocated from the site prior to construction and would be subject to harassment and possibly death or injury. The proposed desert tortoise translocation area is located immediately west of the solar plant site and has similar habitat to Unit 2, except near at the base of the McCoy Mountains. Substrates there are cobbly and bouldery, with rills and outflows of these larger particles flowing out from the mountain canyons.

Tortoises could die or become injured by capture and relocation if these methods are performed improperly, particularly during extreme temperatures, or if they void their bladders. If multiple desert tortoises are handled by biologists without the use of appropriate protective measures, pathogens could be spread among the tortoises, both resident and relocated or translocated animals. Relocated tortoises also could be subject to increased risk of predation, increased intraspecific competition, reduced availability of food or water resources, reduced health, exposure to environmental elements, and death. The addition of external site fencing also could present a movement barrier to off-site tortoises that would alter their home range and could separate individuals from the regional tortoise population.

As discussed in Section 4.3, *Biological Resources - Vegetation*, during and following construction, several invasive plant species could colonize disturbed areas within the solar plant site fencing and spread into adjacent vegetation communities, thereby reducing habitat values for native plant and wildlife species. The spread of invasive weeds both within and outside of the Project boundary could result in the degradation of additional habitat for the desert tortoise.

Construction activities are expected to disrupt the desert pavement surface layer and expose fine silt and other erosion-prone soils. This would temporarily increase suspended dust in off-site desert tortoise habitat, particularly during periods of high wind. Increased dust may have adverse effects on the health and survival of individual tortoises. The exposure of desert tortoises to dust suppression chemicals, if used, would have unknown effects on tortoise populations.

Mojave Fringe-toed Lizard

The Mojave fringe-toed lizard has wide distribution in portions of the gen-tie line alignment located south of I-10, with 263 lizards identified in the study area during surveys. This species does not occur on the solar plant site. Direct impacts to Mojave fringe-toed lizards during construction of the gen-tie line, distribution line, and associated access roads would occur due to the permanent loss of 19.0 acres and temporary disturbance to an additional 19.0 acres of undifferentiated sand and sand sheet habitat that is occupied by Mojave fringe-toed lizards, and accidental mortality of lizards from vehicle strikes (see Table 4.3-3). Indirect Project impacts include increased predation on lizards by raptors, ravens, and other birds such as loggerhead shrike; the introduction and spread of exotic vegetation species; fragmentation and degradation of occupied dune habitat; and hazards associated with the spraying of herbicides and dust suppression chemicals within occupied habitat.

Couch’s Spadefoot Toad

If present, direct effects to Couch’s spadefoot toads would include loss of potential breeding habitat and direct mortality during grading or construction. Indirect impacts could result from hydrology changes that reduce flow to breeding areas. In addition, construction noise could trigger emergence when breeding conditions are not favorable. Potential breeding habitat was detected at seven swales on the gen-tie line and access road route and one location in the southwest portion of the solar plant site, and based on reported sightings along the I-10 corridor to the east and west of the Project site (Dimmit, 1977), and because the Project region is mapped as Couch’s spadefoot toad habitat (BLM, 2002), ponds and pools in the study area are considered to provide potentially suitable spadefoot breeding habitat. High-quality breeding habitat was also reported within a borrow pit and graded depression north of I-10 (Tetra Tech EC, Inc. and Karl, 2011a; 2011b). However, species-specific breeding season surveys for this species observed no adults, tadpoles, or eggs in breeding locations in the surveyed area (Tetra Tech EC, Inc., 2012b).

Nesting Birds

The Proposed Action would result in direct and indirect impacts to nesting bird species protected under Fish and Game Code §§3503.5 and 3511, and the Migratory Bird Treaty Act. These disturbances could cause nest abandonment and death of young or loss of reproductive potential at active nests located in or near the study area. Impacts may occur through the removal of vegetation and/or through vehicle and foot traffic or excessive noise associated with construction. Additionally, night lighting during construction has the potential to affect nesting bird species.

Golden Eagle

The Proposed Action occurs in the breeding range of the golden eagle and is proximate to 5 nesting territories, all of which were inactive in 2011. The closest active nest detected during 2010/2011 surveys is approximately 9.2 miles northeast of the Project in the Big Maria Mountains (Tetra Tech EC, Inc., 2011). The closest inactive nest is greater than 1.5 miles west of the Project in the McCoy Mountains. The Project would not result in direct or indirect impacts to golden eagle nests because of the large distance between active nest sites and the Project site. Due to lack of active nests near the Project and low observed prey densities on the site, golden eagles are expected to forage infrequently in the immediate vicinity of the Project (Tetra Tech EC, Inc., 2011).

Western Burrowing Owl

Within the study area, 14 recently active owl burrows, two burrowing owl pairs, and four individual owls were observed on the solar plant site. Four additional owls were detected in the study area west of the solar plant site boundary. One owl pair and one active burrow also were noted on the gen-tie line and access road route north of I-10 (Tetra Tech EC, Inc. and Karl, 2011a; 2011b). It is anticipated that all identified active burrows on the solar plant site would be removed during Project construction and those on the linear corridor would be avoided where feasible. The entire Project area is considered to provide suitable burrowing owl foraging habitat.

In addition to direct impacts on individual owls and burrows, burrowing owl survival can be indirectly affected by human disturbance and foraging habitat loss even when impacts to individual owls and burrows are avoided. A significant impact to the burrowing owl may occur if there is:

1. Disturbance or harassment within approximately 160 feet of occupied burrows;
2. Destruction of burrows and burrow entrances; and/or
3. Degradation of foraging habitat adjacent to occupied burrows (i.e., an approximately 6.5 acres based on a 300-foot radius around each occupied breeding or resident burrow; CDFG, 1995).

American Badger and Desert Kit Fox

Project construction has the potential to injure or kill American badgers and desert kit foxes by crushing them with construction equipment or by crushing den entrances, which would prevent them from escaping. Following the erection of perimeter fencing around the solar plant site and subsequent wildlife clearance surveys, the perimeter fence would limit badger and kit fox access to the main Project site, and consequently would reduce the likelihood of injury on the site during construction. There is also a low risk that individual animals could be inadvertently injured or killed by vehicles on access roads.

In late 2011, the first known cases of canine distemper virus (CDV) were observed in desert kit foxes about 20 miles west of Blythe on public lands managed by the BLM and leased to Genesis Solar LLC to construct the Genesis Solar Energy Project site. CDFG believes that the outbreak originated from an infected host animal entering the site, possibly a wild or domestic dog, American badger, or other carnivore. The rapid spread of CDV within the kit fox population was facilitated by the project-related displacement of infected animals from the Genesis site into new kit fox territories. Subsequently, desert kit foxes were captured for disease testing at the First Solar Desert Sunlight, Solar Millennium Palen, Genesis Ford Dry Lake, and at Southern California Edison's Colorado River substation and CDV was identified at the two later sites, which span a distance of about 40 miles on the I-10 corridor within the Chuckwalla Valley (CEC, 2012). The CDFG Wildlife Investigations Lab continues to monitor the health of desert kit foxes and is attempting to characterize the spread and significance of the disease on regional kit fox populations. To date, there has been no effort to test desert kit foxes in the Project area for distemper.

The typical practice for solar projects has been to exclude desert kit foxes from project areas during pre-construction clearing of project sites by “passive relocation” methods (i.e., by closing burrows, forcing foxes to locate to new off-site burrows). In the absence of protective measures the Project has the potential to worsen the CDV outbreak by raising kit fox stress levels and causing increased susceptibility to infection, causing increased movement of diseased animals thereby increasing the spread of disease into new areas, or placing healthy kit foxes into contact with off-site infected animals (CEC, 2012).

Nelson’s Bighorn Sheep and Burro Deer

The intermountain valley floor within the solar plant site is unlikely to serve as a potential movement corridor for Nelson’s bighorn sheep based on their documented absence from the McCoy Mountains. Presently, the McCoy Mountains are considered an unoccupied portion of the bighorn’s range. Repopulation in the McCoy Mountains could happen naturally or could happen deliberately via translocation of breeding individuals. The CDFG has successfully re-established bighorn in some ranges in the past. Due to the absence of bighorn sheep from the Project area, the construction phase of the Project would not adversely affect habitat for this species or cause effects to individual sheep or sheep populations.

The Project would not present a complete barrier to movement between mountain ranges as sheep still could disperse around the site to the west, north, and east. Corridors described in the NECO Plan (BLM, 2002) identify potential for bighorn sheep movement from the McCoy Mountains northeast to the Little Maria Mountains and west to the Palen Mountains. Further, the Project site, due to the width of the valley in which the solar facility would be located, has limited value as a movement corridor.

Direct and indirect construction impacts to burro deer include the loss of foraging habitat in desert dry wash woodlands, vegetated swales, and Sonoran creosote bush scrub habitat, and potential barriers to local and regional deer movement. The Project would not present a barrier to regional movement because deer still could disperse around the site to the west, north, and east.

Special-Status Bats

One potential bat roost was identified in Unit 2 of the solar plant site. This roost exhibited a small amount of bat guano, but no current use by bats (Tetra Tech EC, Inc. and Karl, 2011a). This cavity may have been used as a roost by California leaf-nosed bat or pallid bat. All habitats within the solar plant site are suitable for bat foraging; though potential roost sites are limited to the single identified cavity. The Project would avoid this potential bat roost, as it is located in a wash that would be avoided. Direct and indirect impacts to bat species are expected if construction activities were to disrupt nighttime foraging activities.

Operation and Maintenance

Special-Status Amphibians and Reptiles

The presence of employees on the Project site during O&M activities could introduce trash into the area and attract common ravens, coyotes, or other desert tortoise predators. Similarly, the creation of up to 8 acres of netted evaporation ponds could attract predatory species, even if they cannot gain access to the ponds. Increased predation upon desert tortoises would be an indirect Project impact. Similar impacts would be anticipated to Mojave fringe-toed lizard.

Lighting for the Project could disturb special-status wildlife species in adjacent areas. Night lighting would be provided at the O&M building, Unit 1 and Unit 2 substations, site entrance, and switchyard. All lighting would be kept to the minimum required for safety and security; sensors, motion detectors, and switches would be used to keep lighting turned off when not required; and all lights would be hooded and directed downward to minimize backscatter and off-site light.

Because potential habitat for Couch’s spadefoot toad would be removed from the solar plant site during construction, O&M impacts to this species are not anticipated. If any off-site breeding habitat is not directly affected during construction, breeding pools or individual toads could be subject to direct impact during O&M activities.

Migratory Birds

Operation and maintenance activities are unlikely to result in direct or indirect impacts to nesting bird species protected under the Migratory Bird Treaty Act and the Fish and Game Code. O&M activities could result in active nests being removed from existing facilities if conflicts are identified (e.g., nest locations create a hazardous situation). There is a low chance that nesting bird disturbance could occur in association with the removal or management of vegetation within the solar plant site or other facilities site, or due to foot or vehicle traffic associated with O&M activities. Additionally, night lighting during O&M activities has the potential to affect nesting bird species.

Golden Eagle

The Project would not result in direct or indirect impacts to golden eagle nest sites during O&M activities because the nearest inactive nest site is greater than 1.5 miles from the Project site, and the nearest active nest is 9 miles from the site. Based on avian point counts and focused golden eagle surveys, foraging use of the study area is considered low (Tetra Tech EC, Inc., 2011).

The Project gen-tie line would be approximately 14.5 miles long, and typical spacing between the 70 to 145-foot-tall monopole or H-frame structures would be approximately 800 to 1,000 feet. The gen-tie line would consist of a high voltage line and fiber optic telecommunication line that would be strung between the structures. The high voltage line could pose an electrocution hazard to perching raptors, including golden eagles, and both lines could pose a collision hazard to birds and possibly bats. Although there is a potential for mortality due to collision with the gen-tie or distribution lines, the potential is low due to the distance from known nests and nesting habitat and the lack of known prey concentrations on the Project site (Tetra Tech EC, Inc., 2011).

The BLM has considered whether development of the MSEP could cause impacts to golden eagles related to the loss of potential foraging habitat. Although it is unknown whether golden eagles that might nest in the McCoy, Little Maria, and Big Maria Mountains in the future would utilize the Project Area for foraging, avian point counts that have been conducted for the Project suggest that golden eagles do not use the area for foraging (see, e.g., Tetra Tech EC, Inc., 2011). Nonetheless, conservatively assuming that they would forage in the Project Area, the Golden Eagle Risk Assessment prepared by Tetra Tech and independently evaluated by the BLM and its NEPA contractor (Appendix C-3), considered the question and has determined that impacts related to the potential Project-related loss of such foraging habitat are likely to be minimal. This is because the area with the requested ROW represents 3 percent of the area within a 10-mile radius of the nearest eagle nest in the McCoy Mountains, which is an inactive nest located 1.7 miles to the west of the Project Area; 3 percent of the area of the next closest nest, which is an inactive nest located 3 miles to the southwest; and 1.5 percent of the area roughly central to the next closest nests, which are located 5.6 miles west-northwest and 8.4 miles northwest, respectively. Additionally, the requested ROW represents 0.4 percent of the area within a 10-mile radius of the active eagle nest in the Big Maria Mountains that was identified during spring 2010 surveys and determined in spring 2011 surveys to be occupied by red-tailed hawks. Furthermore, the habitat that would be disturbed or removed by development of the Project is neither unique nor limiting on the landscape, and does not represent a known prey concentration. Comparable or better foraging opportunities are expected to be available within the surrounding areas. For these reasons, development and operation of the Project is not expected to disturb the foraging of any eagle pairs within 10 miles of the Project site.

Western Burrowing Owl

Operation and maintenance actions have a low likelihood to affect burrowing owls because activities would largely occur within the developed solar plant site. These activities are not expected to remove burrowing owl breeding or foraging habitat, and would occur only on Project access roads and within permanent work areas.

American Badger and Desert Kit Fox

Because new ground disturbance would be minimal during O&M activities, it is unlikely that such activities would injure or kill American badgers or desert kit foxes. A low risk remains that badgers or foxes could be inadvertently injured or killed by vehicles on access roads during O&M activities.

Nelson's Bighorn Sheep and Burro Deer

Once the Project is constructed, noise and human activity are expected to be similar to pre-Project conditions. The Project site is located in an area that receives minimal public use, Therefore, O&M activities are not expected to have any more effect from vehicular use and human activity than what already occurs in the area.

Development and the associated increases in human activities adjacent to and within occupied Nelson's bighorn sheep and burro deer habitat have the potential to adversely affect these species by fragmenting habitat areas if located in close proximity to the base of the McCoy Mountains. If reintroduced to the area, the Project would only have a minor impact on the potential regional connectivity corridor for bighorn sheep because the movement corridor is maintained to the west, north, and east of the solar plant site.

Impacts to burro deer during maintenance and operation include minor barriers to local and regional deer movement; however, the Project would not present a barrier to regional movement because deer still could disperse around the site to the west, north, and east.

Special-Status Bats

Night lighting close to the ground at the Project site and insect populations potentially associated with evaporation ponds could attract bats to the site. There is a low risk that special-status bat could collide with new monopoles, H-frame structures, or lines associated with the gen-tie line and distribution line.

Decommissioning

Decommissioning is anticipated to only directly affect areas that were previously disturbed during installation of Project facilities. Thus, the direct removal of wildlife habitat is not anticipated for decommissioning activities. Potential direct and indirect effects to wildlife populations during decommissioning are similar to those described for the construction phase of the Project and include wildlife disturbance from noise, light, or dust, and the introduction of invasive plant species by various vectors. Revegetation of the site and removal of exclusion fencing would benefit wildlife in the area; however, the restored wildlife access to large expanses of denuded habitat that lack food, water, and cover could subject special-status species such as desert tortoises to mortality hazards long after site decommissioning.

4.4.4 Alternative 2: Reduced Acreage

4.4.4.1 Direct and Indirect Impacts

The types of impacts related to construction, operation and maintenance, and decommissioning on wildlife resources under Alternative 2 would be similar to those described for Alternative 1. The main difference in impacts between Alternative 1 and Alternative 2 is that the solar plant site would be smaller to minimize impacts to areas with higher concentrations of active desert tortoise sign located in Unit 2. Alternative 2 would have a permanent impact on approximately 2,264.5 acres of habitat, including 2,259 acres within the solar plant site fence, and 5.5 acres for the distribution line. As discussed in Section 3.4, substantially less active desert tortoise sign was observed within the footprint of Alternative 2 (i.e., in Unit 1) as compared with Alternative 1 (Figure 3.4-2). As a result, less wildlife habitat would be disturbed under Alternative 2, resulting in fewer direct and indirect impacts on desert tortoise populations.

There is a slight difference in the special-status species that have been observed in Alternative 1 compared to Alternative 2, as summarized in Table 4.4-2. However, all of the same special-status species have the potential to occur in areas for both alternatives. Lastly, impacts to wildlife movement would be reduced as a smaller amount of habitat would be permanently removed. Thus, a greater amount of habitat would be preserved for intermountain and localized, valley floor wildlife movements.

Impacts to the Mule Mountains Multiple-species WHMA for Alternative 2 would be identical to those under Alternative 1, as impacts would be incurred at the switchyard that are common to both alternatives.

The APMs and mitigation measures for Alternative 2 would be the same as those described under Alternative 1, with adjustments to reduce the amount of off-site compensatory habitat needed to mitigate impacts for Alternative 2.

4.4.5 Alternative 3: Reconfigured Gen-tie/Access Road Routes

4.4.5.1 Central Route

Under the Alternative 3 Central Route, construction, operation and maintenance, and decommissioning impacts on wildlife resources would be similar to those described for the Alternative 1 gen-tie line (Eastern Route). The anticipated impacts presented in Table 4.4-1 presume that the Central Route would traverse an approximately 2-mile portion of the adjacent BSPP site that has already been graded and therefore does not contain natural habitat. The Central Route would permanently affect up to 94.3 acres of mostly Sonoran creosote bush scrub habitat. Most impacts would be associated with the construction and maintenance of all-weather access roads to structure locations.

Focused wildlife surveys were not performed by the Applicant for the two alternative gen-tie line routes; however, site-specific analyses performed for the BSPP indicate that wildlife habitat in the alternative gen-tie alignments is comparable to that on the proposed solar plant site. Similar to the Project site, desert tortoise sign on the BSPP site was more common on the western portion of the site near the base of the McCoy Mountains, with relatively less sign identified on the eastern portion of the site (AECOM, 2010a as cited in CEC, 2010). Direct impacts to other special-status wildlife for the Central Route would similar to those described for Alternative 1. The APMs and mitigation measures for Alternative 3 would be the same as those described under Alternative 1.

4.4.5.2 Western Route

Under the Alternative 3 Western Route, construction, operation and maintenance, and decommissioning impacts on wildlife resources would be similar to those described for the Alternative 1 gen-tie line (Eastern Route). However, the Western Route would impact approximately 148.7 acres of mostly Sonoran creosote bush scrub habitat.

Site-specific analyses performed for the BSPP indicate that wildlife habitat in the alternative gen-tie alignments is comparable to that on the solar plant site. Similar to the Project site, desert tortoise sign on the BSPP site was more common on the western portion of the site near the base of the McCoy Mountains, with relatively less sign identified on the eastern portion of the site (AECOM, 2010a as cited in CEC, 2010). Due to the concentration of desert tortoise sign on the western portion of the site, and the incrementally longer length of the portion unique to the Western Route, the Western Route would impact more and relatively higher quality desert tortoise habitat than the Alternative 1 gen-tie line and access road and could impact a greater number of individual tortoises.

Direct impacts to other special-status wildlife for the Western Route would similar to those described for Alternative 1. The APMs and mitigation measures for Alternative 3 would be the same as those described under Alternative 1.

4.4.6 Alternative 4: No Action Alternative

Under this alternative, the Project would not be approved by the BLM. As a result, lands administered by BLM would continue to be managed consistent with current land use designations in the CDCA Plan. The MSEP site is within the Riverside East SEZ as designated in the Solar PEIS ROD. The Solar PEIS ROD amended the CDCA Plan to identify lands within the Riverside East SEZ as suitable for solar energy development; therefore, it is very likely that commercial-scale solar development would be promoted within the ROW application area even if this No Action Alternative were selected. All other uses allowable on CDCA MUC-L lands and on the affected private lands would continue to be available. However, because the configuration, nature, location, resource intensiveness, and other factors related to any future solar energy project are unspecified and uncertain, the BLM cannot predict the potential consequences to wildlife resources that might result from such development, and so finds that particular impacts are too speculative to evaluate meaningfully in this PA/FEIS.

4.4.7 Cumulative Impacts

4.4.7.1 Geographic Scope

The geographic scope for this cumulative impact analysis considers the incremental effects of the analyzed alternatives relative to other past, present, and reasonably foreseeable projects that affect wildlife. For wildlife resources, the geographic scope of analysis is based on species distribution and landforms surrounding the Project site and the natural boundaries of the resource affected, rather than jurisdictional boundaries.

The analysis considers potential effects at different scales for different species, with the analysis generally concentrating on wildlife resources in the Palo Verde watershed and a portion of the Chuckwalla Valley watershed in eastern Riverside County. This scale was used to analyze cumulative effects on Mojave fringe-toed lizard, Couch’s spadefoot toad, migratory birds, western burrowing owl, American badger, kit fox, and Nelson’s big horn sheep. The geographic scope for assessing cumulative effects to desert tortoise and golden eagle were somewhat larger, as described below.

4.4.7.2 Temporal Scope

In addition to short-term construction impacts, the Project would have ongoing operational impacts on some biological resources. Therefore the temporal scope of the cumulative effects analysis for wildlife includes the construction, operation and maintenance, and decommissioning phases of the Project.

4.4.7.3 Regional Overview

A discussion of regional impacts to vegetation communities and associated wildlife habitat was provided in Section 4.3.7.3, and is not repeated in this section. This section provides a detailed discussion of the effects of past, present, and future projects to wildlife resources in the Project vicinity.

Those areas in eastern Riverside County where existing and cumulative projects occur or are anticipated provide habitat for numerous special-status wildlife species, including desert tortoise, Mojave fringe-toed lizard, Couch’s spadefoot toad, golden eagle, burrowing owl, American badger, desert kit fox, and Nelson’s bighorn sheep, among others. Tables 4.1-3 and 4.1-4 identify those existing and reasonably foreseeable projects, respectively, in the cumulative effects study area. These include other proposed or approved renewable energy projects, BLM authorized actions or activities, proposed or approved projects within the counties’ jurisdictions, and other actions/activities that Lead Agencies consider reasonably foreseeable. Generally, existing and cumulative projects have been sited outside of many sensitive areas that support these species, which include the Joshua Tree DWMA, Chuckwalla DWMA, and other DWMAs. However, substantial wildlife populations occur outside of managed and protected areas and are vulnerable to habitat loss and degradation, or other threats. While the Project is located within the NECO planning area, it is not located within the boundaries of the Chuckwalla DWMA, Joshua Tree DWMA, or Chuckwalla Unit of Critical Habitat for desert tortoise.

Land uses in the cumulative analysis area historically have been altered by human activities, resulting in conversion of undeveloped land and habitat loss, fragmentation, and degradation. Reasonably foreseeable future projects that could impact biological resources in the cumulative impacts area characterize overall development trends in the Palo Verde Valley and nearby Chuckwalla Valley. Much of the future development in the area is dominated by renewable energy projects. Major renewable projects require extensive access roads and new transmission lines to tie into the existing electrical grid system.

Other projects in the cumulative study area include several transmission lines and nonrenewable energy development, as well as residential and commercial development. In addition to one-time construction impacts, many of the cumulative projects would have ongoing operational impacts on wildlife resources. Therefore, all projects that might contribute impacts over time in the cumulative area are considered for this analysis. This would include nonrenewable energy, transmission lines, wind power, and solar power projects.

General threats to common and special-status wildlife species in the cumulative effects study area include the fragmentation of habitat from roads and urban development, the effects of historic livestock grazing on wildlife forage structure and availability, the effects of military training activities, and agricultural development. In the context of other existing and reasonably foreseeable projects, the proposed Project has the potential to further reduce wildlife habitat and incrementally degrade adjacent habitat. Thus, the Project would contribute to the cumulative loss and degradation of habitat for desert tortoise, Mojave fringe-toed lizard, and other species in the Palo Verde watershed.

Wildlife Habitat

The development of numerous large-scale projects such other solar generation facilities would result in the permanent conversion of wildlife habitat to industrial and commercial uses. Table 4.4-3 presents the estimated area of available wildlife habitat in the cumulative effects study areas, and the cumulative impacts on each species from existing projects and foreseeable future projects. Existing and future impact areas were derived using the list of existing and reasonably foreseeable projects in the Palo Verde Valley and nearby Chuckwalla Valley, as identified in Section 4.1.

The total projected habitat loss in the cumulative study area for wildlife resources includes approximately 3.3 percent of habitat for desert tortoise, 0.2 percent of habitat for Mojave fringe-toed lizard in the Palo Verde Valley, 15.1 percent of foraging habitat for golden eagle, 17.7 percent of habitat for burrowing owl, American badger, and desert kit fox, and less than 0.1 percent of habitat for Nelson's bighorn sheep (Table 4.4-3). Alternatives 1, 2, and 3 would contribute to cumulative impacts on these resources.

However, implementation of Mitigation Measures VEG-7, VEG-8, VEG-9, VEG-12, WIL-1, WIL-2, WIL-4, WIL-5, WIL-6, WIL-7, WIL-8, WIL-9, WIL-10, WIL-12, and WIL-13, would reduce impacts to sensitive wildlife species and their habitat and provide that impacted habitat is adequately mitigated with equivalent habitat that would be protected off-site.

TABLE 4.4-3
SUMMARY OF CUMULATIVE IMPACTS ON WILDLIFE HABITAT

Wildlife Species *Cumulative Study Area*	**Available Habitat in the Cumulative Study Area**	**Impacts to Habitat from Existing Projects (percent of habitat in cumulative study area)**	**Impacts to Habitat from Foreseeable Future Projects (percent of habitat in cumulative study area)**	**Contribution of Alternative 1 to Future Cumulative Impacts (percent of total impacts from future projects)**	**Contribution of Alternative 2 to Future Cumulative Impacts (percent of total impacts from future projects)**	**Contribution of Alternative 3 (Central) to Future Cumulative Impacts (percent of total impacts from future projects**	**Contribution of Alternative 3 (Western) to Future Cumulative Impacts (percent of total impacts from future projects**
Desert tortoise *Eastern Colorado Recovery Unit*	2,600,000 acres	5,540 acres (0.2%)	86,523 acres (3.3%)	4,496 acres (5.2%)	2,318 acres (2.7%)	94 acres (0.1%)	149 acres (0.2%)
Mojave fringe-toed lizard *Occupied sand dune/ sand sheet habitat in the Palo Verde Valley*	12,911 acres	35 acres (0.3%)	76 acres (0.6%)	38 acres (50%)	0.0 acres (0.0%)	38 acres (50%)	38 acres (50%)
Golden eagle *10-mile Project buffer*	398,823 acres	2,998 acres (0.8%)	60,175 acres (15.1%)	4,496 acres (7.5%)	2,318 acres (3.9%)	94 acres (0.2%)	149 acres (0.3%)
Burrowing owl / American badger/ desert kit fox *BLM-identified habitat in the Palo Verde watershed*	286,084 acres	557 acres (0.2%)	50,557 acres (17.7%)	4,496 acres (8.9%)	2,318 acres (4.6%)	94 acres (0.2%)	149 acres (0.3%)
Nelson's bighorn sheep *All WHMAs in the NECO planning area*	3,821,768 acres	0 acres (0.0%)	753 acres (<0.1%)	0 acres	0 acres	0 acres	0 acres

Desert Tortoise

At the direction of BLM, the cumulative effects study area for desert tortoise considered existing and future projects in the Eastern Colorado Recovery Unit planning area, as defined in the Desert Tortoise Recovery Plan (USFWS, 1994). The Recovery Plan focuses on desert tortoise populations within each of five distinct recovery units, with the fundamental recovery goal of ensuring sufficient population size and stability within an ample amount of protected habitat in each area. The Eastern Colorado Recovery Unit includes the Joshua Tree DWMA and Chuckwalla DWMA, and includes both the Chuckwalla Valley and Palo Verde Valley (Figure 4.4-1). USFWS-designated critical habitat for desert tortoise occurs within the Chuckwalla Unit, which significantly overlaps the Joshua Tree and Chuckwalla DWMAs.

While desert tortoises occur in low densities in the Palo Verde Valley, the Project site is not located within or between lands that are specifically managed for desert tortoise conservation. The Joshua Tree DWMA, Chuckwalla DWMA, and designated critical habitat for desert tortoise are greater than 10 miles west of the Project site and would not be impacted by the Project. A 2.6 million-acre study area was identified for desert tortoise in the Eastern Colorado Recovery Unit, of which approximately 86,523 acres (3.3 percent) would be impacted by future projects (Table 4.4-3). Alternative 1 would contribute approximately 5.2 percent of the total cumulative impact from future projects, affecting about 0.2 percent of available desert tortoise habitat in the recovery unit. Under Alternative 2 the Project would contribute 2.7 percent of the total impact from future projects. The Central Route would contribute 0.1 percent and the Western Route would contribute 0.2 percent of the total impact from future projects. Direct and indirect effects to tortoises and their habitat would be offset through the application of APM BIO-1 through APM BIO-4, and the implementation of Mitigation Measures WIL-1 though WIL-5. The loss of tortoise habitat and direct and indirect effects to this species are anticipated to result in cumulative effects on populations; however, the implementation of the required protection measures that include salvage of desert tortoises, compensatory mitigation, and site restoration following decommissioning would ensure that the loss of tortoise habitat is adequately compensated for and comparable or higher quality habitat would be protected off-site.

Mojave Fringe-toed Lizard

The analysis of cumulative Project effects to Mojave fringe-toed lizard habitat focused on known and CNDDB-documented populations within the Palo Verde Valley. In these areas, populations are dependent upon areas with fine aeolian sand that occur in association with dunes, margins of dry lakes and washes, and isolated sand patches. The cumulative effects analysis identified approximately 12,911 acres of occupied Mojave fringe-toed lizard habitat in the study area, of which approximately 76 acres (0.6 percent) occurs in areas where future projects are proposed (Table 4.4-3). Under Alternatives 1 and 3, approximately 38 acres of habitat would be disturbed for the gen-tie line and associated access road. This represents approximately 0.3 percent of available Mojave fringe-toed lizard habitat that was identified in the cumulative study area and represents a contribution of 50 percent of the total cumulative effect on this resource. The implementation of Mitigation Measures VEG-7, VEG-8, VEG-10, VEG-11, VEG-12, and WIL-10 would minimize impacts to sensitive dune and sand sheet habitat and provide suitable compensatory habitat for habitat losses.

Couch's Spadefoot Toad

Many of the cumulative scenario projects in the Palo Verde Valley are within the described range of the Couch's spadefoot toad; however, this species has patchy and disconnected distribution in the area. Given the unpredictable and somewhat unknown distribution of this species in the regional project area, the cumulative effects of multiple projects on spadefoot populations are not known. Species-specific surveys during breeding season did not observe this species in the study area, and significant impacts were not identified to Couch's spadefoot toad from other projects under the cumulative scenario.

Nesting Birds

Direct impacts to actively breeding birds would be avoided through the implementation of measures that would provide consistency with Fish and Game Code §§3503.5 and 3511, and the Migratory Bird Treaty Act. Under these laws, the removal or disturbance of active nests is prohibited. With implementation of WIL-6 and WIL-7, which require an Avian and Bat Protection Plan and preconstruction nesting bird surveys, the Project would not impact migratory birds other than those that are individually discussed in this PA/FEIS (e.g., burrowing owl). Other future projects would be required to implement similar measures to ensure compliance with federal and state bird protection regulations.

Golden Eagle

The cumulative analysis for golden eagle that was included in the Draft PA/EIS considered the potential for Project impacts to interact with impacts caused by past, present, and reasonably foreseeable future projects within 10 miles of the Project site to cause or contribute to cumulative effects. The 10-mile radius is consistent with USFWS guidance for inventorying golden eagles that occur near a specific project (Pagel et al., 2010). Within this area, the BLM identified 25 past, present and future projects (see Figure 4.4-1 in Section 4.1). Based on a review of known and historic golden eagle breeding sites in the 10-mile golden eagle study buffer, none of the cumulative projects would impact golden eagle breeding sites. However, many of the projects are located or proposed within natural habitat that provides foraging opportunities for golden eagles. A geographic information system (GIS)-based analysis identified 398,823 acres of potentially suitable golden eagle foraging habitat within 10 miles of the Project site. Within that area, future projects would impact 60,175 acres (15.1 percent) of potential foraging habitat, and the Proposed Action and action alternatives would contribute between 0.2 and 7.5 percent of this cumulative impact, as shown in Table 4.4-3. Following USFWS guidance, the loss of potential golden eagle foraging habitat would be considered significant if losses occurred within 1.0 mile of an active nest. However, no active nests are known within 1.0 mile of the Project and few if any nests are known near other projects considered in the cumulative scenario. Few (if any) impacts are anticipated to golden eagle nesting sites generally because this species tends to regionally nest in remote mountainous areas where no active projects are proposed. With the implementation of Mitigation Measure WIL-12, the proposed Project would avoid direct effects to golden eagle.

In its comments on the Draft PA/EIS, USFWS recommended that cumulative impacts to golden eagles be evaluated at the local area population level, which is based on the average natal dispersal distance of the nest or nests under consideration, or 140 miles for golden eagles (Pagel et al., 2010). The area included within a 140-mile radius of the (inactive) nest located farthest from the Project site includes approximately 40,494,295 acres, or 63,272 square miles, and stretches to the north, nearly to Las Vegas; to the south, to the Gulf of California in Mexico; to the east, to Phoenix Arizona; and to the west, to the City of Riverside. Golden eagle helicopter survey data generated in accordance with USFWS guidance (Pagel et al., 2010) is not available for the extent of this area. If it were available, it would be possible to quantify the Project-specific incremental impact relative to cumulative conditions to make a determination as to the NEPA significance of the MSEP's contribution to cumulative effects within the geographic area recommended by USFWS.

In the absence of golden eagle survey data for the recommend 140-mile radius, the BLM has considered MSEP-specific impacts to golden eagles together with the impacts of other projects within the Riverside East Solar Energy Zone (SEZ), as evaluated in the Final Solar PEIS, to provide a larger cumulative context (BLM and DOE, 2012).[1] This is geographically appropriate, since the MSEP site is located within the Riverside East SEZ. Table 9.4.12.1-1 of the Final Solar PEIS (p. 9.4-73) discloses that approximately 3,104,000 acres of potentially suitable golden eagle habitat occurs within the Riverside East SEZ, of which 65,300 acres (2.1 percent) of available potentially suitable foraging habitat would be lost as a result of direct effects of the solar development anticipated within the SEZ, and 244,600 acres (7.9 percent) of such habitat would be affected by indirect effects outside the SEZ.[2] In the Final Solar PEIS, the BLM concluded that a "moderate" overall impact would occur on foraging habitat only. The Final Solar PEIS also states, "The potential degree of indirect effects would decrease with increasing distance from the SEZ" (BLM and DOE, 2012, Table 9.4.12.1-1).

Western Burrowing Owl, American Badger, and Desert Kit Fox

As characterized by the NECO Plan (BLM, 2002), the Palo Verde watershed provides extensive habitat for western burrowing owl, American badger, and desert kit fox. While each species has its own specific habitat requirements, there is considerable overlap in the types of habitat used by these species. The cumulative analysis of effects to these species focused on potential habitat in the Palo Verde watershed, as mapped in the NECO Plan. A GIS-based analysis identified approximately 286,084 acres of potential habitat in the Palo Verde watershed. Future projects would impact approximately 50,557 acres (17.7 percent) of potentially suitable habitat within this area that supports creosote bush scrub and unvegetated desert pavement; with the Proposed Action and action alternatives contributing between approximately 0.2 and 8.9 percent of that total cumulative impact (Table 4.4-3).

The cumulative projects implemented in undeveloped areas would presumably result in impacts to burrowing owl, American badger, and desert kit fox similar to the Project. Such effects include

1 Bureau of Land Management and U.S. Department of Energy (BLM and DOE), 2012. Final Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States, Volume 2: Arizona and California Proposed Solar Energy Zones Chapters 8 and 9. FES 12-24 • DOE/EIS-0403. Available online: http://solareis.anl.gov/documents/fpeis/Solar_FPEIS_Volume_2.pdf (July).

2 For purposes of the analysis, direct effects within the SEZ consist of the ground-disturbing activities associated with construction and the maintenance of an altered environment associated with operations, and the area of indirect effects was assumed to be the area adjacent to and within 5 miles of the SEZ boundary.

the direct loss of suitable habitat, loss of individual animals, or indirect effects from human presence that result in changes to habitat quality during construction, operation and maintenance, and decommissioning. The implementation of measures identified to protect American badger and desert kit fox (WIL-8) and protect burrowing owls and mitigate habitat losses (WIL-9) would reduce Project impacts.

Nelson's Bighorn Sheep and Burro Deer

As depicted in Figure 3.4-7, the Project is not located with a Nelson's bighorn sheep WHMA and would not result in the loss of habitat for this species within a WHMA. Within the Palo Verde Valley, the Project and the BSPP occur in close proximity to a bighorn sheep WHMA located to the west, in the McCoy Mountains. Should the McCoy Mountains to become occupied by this species at a future time, these two projects are the only identified cumulative actions that would impact potential bighorn sheep movement corridors.

Habitat Connectivity and Wildlife Movement

As discussed above, Project impacts on wildlife movement corridors would be reduced through implementation of APMs and mitigation measures. However, under the cumulative development scenario some residual impacts to wildlife movement are likely to remain even following the application of APMs and mitigation measures. Permanent fencing that is proposed around the MSEP and BSPP projects would create a 5-mile-long wildlife movement barrier that would alter but not likely impede the movement of large wildlife species such as Nelson's bighorn sheep, burro deer, mountain lion, or other highly mobile species. For these wide-ranging species, the Project would not present a barrier to regional movement because animals would still disperse around the site to the west, north, and east. It is anticipated that fencing would pose an impediment to east-west desert tortoise movement near the two project sites; however, such fencing would not impede north-south movement.

The MSEP site does not overlap with any designated Wilderness Areas, ACECs, DWMAs, or WHMAs. In addition, portions of the MSEP site were included in the BLM's draft Solar PEIS recommendations for the Riverside East Solar Energy Study Areas due to the area's low potential for substantial resource conflicts relative to other considered locations. The desert tortoise occurs in low population densities in the Palo Verde Valley, with sparse populations noted at the base of the McCoy Mountains and limited presence east of the MSEP and BSPP sites in association with McCoy Wash (Tetra Tech EC, Inc. and Karl, 2011a; 2011b).

The effects of proposed and future actions on movement of relatively smaller, less mobile species such as desert tortoise are likely to remain even after the application of mitigation measures; however, such impacts would abate for the MSEP and BSPP following Project decommissioning. This cumulative impact is due to the residual effects of habitat fragmentation and impaired east-west movement of the species. It is expected that tortoise habitat located west of the MSEP and BSPP sites at the base of the McCoy Mountains will continue to support tortoise populations and that tortoises will be physically able to circumnavigate the MSEP and BSPP sites to the north and south. Tortoises would not be able to directly traverse the MSEP and BSPP sites; however, the remaining 1-mile-wide movement corridor is of sufficient size that remaining tortoise populations may be sustained and would not be isolated from the regional population. Additionally, habitat on the site would be reconnected to adjacent lands during Project decommissioning and the east-west movement corridor would be restored at that time. With substantial habitat connectivity remaining following the cumulative development scenario, the reduced size of the movement corridor presents an adverse, though not substantial impact to the desert tortoise. Direct and indirect effects to tortoises would be reduced and mitigated through the application of APM BIO-1 through APM BIO-4, and the implementation of Mitigation Measures WIL-1 though WIL-5.

Local Policies or Ordinances Protecting Biological Resources

The Project is not proposed within the boundaries of any adopted habitat conservation plan or natural community conservation plan. The Project site is within the CDCA and is within the planning boundaries of the NECO Plan amendment to the CDCA Plan. The Project was planned and designed in coordination with BLM with the intent of providing consistency with the NECO Plan and CDCA Plan.

4.4.8 Mitigation Measures

The following measures shall be implemented to reduce or avoid wildlife species impacts from construction, operation and maintenance, and decommissioning of the Project. Prior to construction, the following plans required by this section and those required in Section 4.3, *Biological Resources - Vegetation*, will be prepared and submitted to the appropriate agencies for review and approval:

1. Desert Tortoise Relocation/Translocation Plan
2. Raven Monitoring and Control Plan
3. Avian and Bat Protection Plan
4. Burrowing Owl Mitigation Plan
5. Biological Resources Mitigation, Implementation, and Monitoring Plan
6. PAR for Mojave Fringe-toed Lizard compensation

These plans or programs are explained below in more detail.

WIL-1: Measures to Avoid Take of Desert Tortoise. The Applicant shall undertake appropriate measures to manage the construction site and related facilities in a manner to avoid or minimize impacts to desert tortoise. Methods for clearance surveys, fence specification and installation, tortoise handling, artificial burrow construction, egg handling, and other procedures shall be consistent with those described in the USFWS (2009) *Desert Tortoise Field Manual* or more current guidance provided by CDFG and USFWS. The Applicant shall also implement all terms and conditions described in the Biological Opinion prepared by USFWS. The Applicant shall implement the following measures:

1. ***Desert Tortoise Exclusion Fence Installation.*** To avoid impacts to desert tortoises, permanent exclusion fencing shall be installed along the permanent perimeter security fence (boundaries) as phases are constructed. Temporary fencing shall be installed along linear features or any subset of the plant site phasing that does not correspond to permanent perimeter fencing. All fencing installation corridors shall be flagged to assist biologists in studying the fence route and surveyed within 24 hours prior to the initiation of fence

construction. Clearance surveys of the desert tortoise exclusionary fence and utility rights-of-way alignments shall be conducted by the Designated Biologist(s) using techniques outlined in the USFWS' 2009 *Desert Tortoise Field Manual* and may be conducted in any season with USFWS and CDFG approval. Biological Monitors may assist the Designated Biologist under his or her supervision. These fence clearance surveys shall provide 100-percent coverage of all areas to be disturbed and an additional transect along both sides of the fence line. Disturbance associated with desert tortoise exclusionary fence construction shall not exceed 30 feet on either side of the proposed fence alignment. Prior to the surveys the Applicant shall provide to the BLM Authorized Officer (BLM AO), CDFG, and USFWS a figure clearly depicting the limits of construction disturbance for the proposed fence installation. The fence line survey area shall be 90 feet wide centered on the fence alignment. Where construction disturbance for fence line installation can be limited to 15 feet on either side of the fence line, this fence line survey area may be reduced to an area approximately 60 feet wide centered on the fence alignment. Transects shall be no greater than 15 feet apart. All desert tortoise burrows, and burrows constructed by other species that might be used by desert tortoises, shall be examined to assess occupancy of each burrow by desert tortoises and handled in accordance with the *Desert Tortoise Field Manual*. Any desert tortoise located during fence clearance surveys shall be handled by the Designated Biologist(s) in accordance with the *Desert Tortoise Field Manual*.

a. *Timing, Supervision of Fence Installation*. The exclusion fencing shall be installed in any area subject to disturbance prior to the onset of site clearing and grubbing in that area. The fence installation shall be supervised by the Designated Biologist and monitored by the Biological Monitors to ensure the safety of any tortoise present.

b. *Fence Material and Installation*. All desert tortoise exclusionary fencing shall be constructed in accordance with the USFWS' *Desert Tortoise Field Manual* (Chapter 8 – Desert Tortoise Exclusion Fence).

c. *Security Gates*. Security gates shall be designed with minimal ground clearance to deter ingress by tortoises. The gates may be electronically activated to open and close immediately after the vehicle(s) have entered or exited to prevent the gates from being kept open for long periods of time.

d. *Fence Inspections*. Following installation of the desert tortoise exclusion fencing for both the permanent site fencing and temporary fencing in the utility corridors, the fencing shall be regularly inspected. If tortoise were moved out of harm's way during fence construction, permanent and temporary fencing shall be inspected at least two times a day for the first 7 days to ensure a recently moved tortoise has not been trapped within the fence. Thereafter, permanent fencing shall be inspected monthly and during and within 24 hours following all major rainfall events. A major rainfall event is defined as one for which flow is detectable within the fenced drainage. Any damage to the fencing shall be temporarily repaired immediately to keep tortoises out of the site, and permanently repaired within 48 hours of observing damage. Inspections of permanent site fencing shall occur for the life of the Project. Temporary fencing shall be inspected weekly and, where drainages intersect the fencing, during and within 24 hours following major rainfall events. All temporary fencing shall be repaired immediately upon discovery and, if the fence may have permitted tortoise entry while damaged, the Designated Biologist shall inspect the area for tortoise.

2. ***Desert Tortoise Clearance Surveys within the Plant Site.*** Clearance surveys shall be conducted in accordance with the final USFWS-approved *Desert Tortoise Translocation Plan, McCoy Solar Energy Project* (Appendix F in the Biological Assessment; TetraTech EC Inc., 2012a) and shall consist of two surveys covering 100 percent the Project area by

walking transects no more than 15 feet apart. If a desert tortoise is located on the second survey, a third survey shall be conducted. Each separate survey shall be walked in a different direction or parallel but offset to allow opposing angles of observation. Clearance surveys for non-linear areas of Phase 1A may be conducted outside the active season. Clearance surveys of the remaining portions of the power plant site may only be conducted when tortoises are most active in the Project vicinity (March through May or September through mid-November). Clearance surveys of linear features may be conducted during anytime of the year. Surveys outside of the active season in areas other than Phase 1A require approval by USFWS and CDFG. Any tortoise located during clearance surveys of the power plant site and linear features shall be relocated and monitored in accordance with the Desert Tortoise Relocation/Translocation Plan:

a. *Burrow Searches*. During clearance surveys all desert tortoise burrows, and burrows constructed by other species that might be used by desert tortoises, shall be examined by the Designated Biologist, who may be assisted by the Biological Monitors, to assess occupancy of each burrow by desert tortoises and handled in accordance with the *Desert Tortoise Field Manual*. To prevent reentry by a tortoise or other wildlife, all burrows shall be collapsed once absence has been determined, but only on the last survey pass and if not occupied by other wildlife. Tortoises taken from burrows and from elsewhere on the power plant site shall be relocated or translocated as described in the Desert Tortoise Relocation/Translocation Plan.

b. *Burrow Excavation/Handling*. All potential desert tortoise burrows located during clearance surveys would be excavated by hand, tortoises removed, and collapsed or blocked to prevent occupation by desert tortoises. All desert tortoise handling and removal, and burrow excavations, including nests, would be conducted by the Designated Biologist, who may be assisted by a Biological Monitor in accordance with the *Desert Tortoise Field Manual*.

c. *Monitoring Following Clearing*. Following the desert tortoise clearance and removal from the power plant site and utility corridors, workers and heavy equipment shall be allowed to enter the Project site to perform clearing, grubbing, leveling, and trenching. A Designated Biologist shall directly monitor site clearing and shall be on-site during grading activities to find and move tortoises missed during the initial tortoise clearance survey. Should a tortoise be discovered, it shall be relocated or translocated as described in the Desert Tortoise Relocation/Translocation Plan.

3. ***Reporting.*** The Designated Biologist shall record the following information for any desert tortoises handled: a) the locations (narrative and maps) and dates of observation; b) general condition and health, including injuries, state of healing and whether desert tortoise voided their bladders; c) location moved from and location moved to (using GPS technology); d) gender, carapace length, and diagnostic markings (i.e., identification numbers or marked lateral scutes); e) ambient temperature when handled and released; and f) digital photograph of each handled desert tortoise as described in the paragraph below. Desert tortoise moved from within Project areas shall be marked and monitored in accordance with the Desert Tortoise Relocation/Translocation Plan (Mitigation Measure WIL-2).

WIL-2: Desert Tortoise Relocation/Translocation Plan. The Applicant shall develop and implement a final Desert Tortoise Relocation/Translocation Plan (Plan) that is consistent with current USFWS approved guidelines, and meets the approval of the BLM AO. The Plan shall include guidance during different phases of Project construction and shall include measures to minimize the potential for repeated translocations of individual desert tortoises. The final Plan shall include all revisions deemed necessary by BLM, USFWS, and CDFG.

WIL-3: Project Notifications and Reporting. The Applicant shall provide BLM staff with reasonable access to the Project site and compensation lands under the control of the Applicant and shall otherwise fully cooperate with BLM's efforts to verify the Project owner's compliance with, or the effectiveness of, mitigation measures. The Designated Biologist shall do all of the following:

1. ***Notification*****.** Notify the BLM AO at least 14 calendar days before initiating construction-related ground disturbance activities; immediately notify the BLM AO in writing if the Applicant is not in compliance with any required conditions of project approval, including but not limited to any actual or anticipated failure to implement mitigation measures within the specified time periods;

2. ***Monitoring During Grubbing and Grading*****.** Remain onsite daily while vegetation salvage, grubbing, grading and other ground-disturbance construction activities are taking place to avoid or minimize take of listed species, to check for compliance with all impact avoidance and minimization measures, and to check all exclusion zones to ensure that signs, stakes, and fencing are intact and that human activities are restricted in these protective zones.

3. ***Monthly Compliance Inspections*****.** Conduct compliance inspections at a minimum of once per month after clearing, grubbing, and grading are completed and submit a monthly compliance report to the BLM AO, USFWS, and CDFG during construction.

4. ***Notification of Injured, Dead, or Relocated Listed Species*****.** In the event of a sighting in an active construction area (e.g., with equipment, vehicles, or workers), injury, kill, or relocation of any listed species, the BLM AO, CDFG, and USFWS shall be notified immediately by phone. Notification shall occur no later than noon on the business day following the event if it occurs outside normal business hours so that the agencies can determine if further actions are required to protect listed species. Written follow-up notification via FAX or electronic communication shall be submitted to these agencies within two calendar days of the incident and include the following information as relevant:

   a. *Injured Desert Tortoise*. If a desert tortoise is injured as a result of Project-related activities during construction, the Designated Biologist shall immediately take it to a CDFG-approved wildlife rehabilitation and/or veterinarian clinic. Any veterinarian bills for such injured animals shall be paid by the Applicant. Following phone notification as required above, the BLM AO, CDFG, and USFWS shall determine the final disposition of the injured animal, if it recovers. Written notification shall include, at a minimum, the date, time, location, circumstances of the incident, and the name of the facility where the animal was taken.

   b. *Desert Tortoise Fatality*. If a desert tortoise is killed by Project-related activities during construction or operation, submit a written report with the same information as an injury report. These desert tortoises shall be salvaged according to guidelines described in the USGS publication *Salvaging Injured, Recently Dead, Ill, and Dying Wild, Free-Roaming Desert Tortoise*. The Applicant shall pay to have the desert tortoises transported and necropsied. The report shall include the date and time of the finding or incident.

5. ***Stop Work Order*****.** The BLM AO may issue the Applicant a written stop work order to suspend any activity related to the construction or operation of the Project to prevent or remedy a violation of one or more required conditions of project approval (including but not limited to failure to comply with reporting, monitoring, or habitat acquisition obligations) or

to prevent the illegal take of an endangered, threatened, or candidate species. The Applicant shall comply with the stop work order immediately upon receipt thereof.

WIL-4: Compensatory Mitigation for Desert Tortoise Habitat Losses. To fully mitigate for habitat loss and potential take of desert tortoise, the Applicant shall provide compensatory mitigation at a 1:1 ratio for impacts to 4,500 acres, adjusted to reflect the final footprint of the selected Project alternative. For the purposes of this measure, the Project footprint means all lands directly disturbed in the construction and operation of the Project, including all linear features, as well as undeveloped areas inside the Project's boundaries that will no longer provide viable long-term habitat for the desert tortoise. To satisfy this measure, the Applicant shall acquire, protect and transfer 1 acre of desert tortoise habitat for every acre of habitat within the final Project footprint, and provide associated funding for the acquired lands, as specified below. Mitigation Measure WIL-15 may provide the Applicant with another option for satisfying some or all of the requirements in this measure. In lieu of acquiring lands itself, the Applicant may satisfy the requirements of this measure by depositing funds into the REAT Account established with the NFWF, as provided below in section 3.h. of this measure.

The timing of the mitigation shall correspond with the timing of the site disturbance activities. However, if security is posted in accordance with 3.g. below (Mitigation Security), the Applicant shall acquire the land, in fee or in easement, no more than 18 months after the start of Project ground-disturbing activities. If compensation lands are acquired in fee title or in easement, the requirements for acquisition, initial improvement and long-term management of compensation lands include all of the following:

1. ***Selection Criteria for Compensation Lands.*** The compensation lands selected for acquisition in fee title or in easement shall:

   a. be within the Colorado Desert Recovery Unit;

   b. provide habitat for desert tortoise with capacity to regenerate naturally when disturbances are removed;

   c. be prioritized near larger blocks of lands that are either already protected or planned for protection, or which could feasibly be protected long-term by a public resource agency or a non-governmental organization dedicated to habitat preservation;

   d. be connected to lands with desert tortoise habitat equal to or better quality than the Project site, ideally with populations that are stable, recovering, or likely to recover;

   e. not have a history of intensive recreational use or other disturbance that does not have the capacity to regenerate naturally when disturbances are removed or might make habitat recovery and restoration infeasible;

   f. not be characterized by high densities of invasive species, either on or immediately adjacent to the parcels under consideration, that might jeopardize habitat recovery and restoration;

   g. not contain hazardous wastes that cannot be removed to the extent that the site could not provide suitable habitat; and

   h. have water and mineral rights included as part of the acquisition, unless the BLM AO, in consultation with CDFG and USFWS, agrees in writing to the acceptability of land.

2. ***Review and Approval of Compensation Lands Prior to Acquisition.*** The Applicant shall submit a formal acquisition proposal to the BLM AO, CDFG, and USFWS describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for desert tortoise in relation to the criteria listed above. Approval from the BLM AO and CDFG, in consultation with BLM and the USFWS, shall be required for acquisition of all compensatory mitigation parcels.

3. ***Compensation Lands Acquisition Requirements.*** The Applicant shall comply with the following requirements relating to acquisition of the compensation lands after the BLM AO and CDFG, in consultation with BLM and the USFWS, have approved the proposed compensation lands:

    a. *Preliminary Report*. The Applicant, or approved third party, shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary or requested documents for the proposed compensation land to the BLM AO and CDFG. All documents conveying or conserving compensation lands and all conditions of title are subject to review and approval by the BLM AO and CDFG, in consultation with the USFWS. For conveyances to the state, approval may also be required from the California Department of General Services, the Fish and Game Commission, and the Wildlife Conservation Board.

    b. *Title/Conveyance*. The Applicant shall transfer fee title to the compensation lands, a conservation easement over the lands, or both fee title and conservation easement as required by the BLM AO and CDFG. Transfer of either fee title or an approved conservation easement will usually be sufficient, but some situations, e.g., the donation of lands burdened by a conservation easement to BLM, will require that both types of transfers be completed. Any transfer of a conservation easement or fee title must be to CDFG, a non-profit organization qualified to hold title to and manage compensation lands (pursuant to California Government Code §65965), or to BLM under terms approved by the BLM AO and CDFG. If an approved non-profit organization holds title to the compensation lands, a conservation easement shall be recorded in favor of CDFG in a form approved by CDFG. If an approved non-profit holds a conservation easement, CDFG shall be named a third party beneficiary.

    c. *Initial Habitat Improvement Fund*. The Applicant shall fund the initial protection and habitat improvement of the compensation lands. Alternatively, a non-profit organization may hold the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California Government Code §65965) and if it meets the approval of CDFG and the BLM AO. If CDFG takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFG or its designee.

    d. *Property Analysis Record*. Upon identification of the compensation lands, the Applicant shall conduct a PAR or PAR-like analysis to establish the appropriate long-term maintenance and management fee to fund the in-perpetuity management of the acquired mitigation lands.

    e. *Long-term Maintenance and Management Fund*. The Applicant shall deposit in NFWF's REAT Account a non-wasting capital long-term maintenance and management fee in the amount determined through the PAR analysis conducted for the compensation lands.

       The BLM AO, in consultation with CDFG, may designate another non-profit organization to hold the long-term maintenance and management fee if the organization is qualified to manage the compensation lands in perpetuity. If CDFG takes fee title to the compensation lands, CDFG shall determine whether it will hold the long-term management fee in the special deposit fund, leave the money in the REAT Account, or designate another entity to manage the long-term maintenance and management fee for CDFG and with CDFG supervision.

f. *Interest, Principal, and Pooling of Funds*. The Applicant, the BLM AO and CDFG shall ensure that an agreement is in place with the long-term maintenance and management fee holder/manager to ensure the following conditions:

   i. Interest. Interest generated from the initial capital long-term maintenance and management fee shall be available for reinvestment into the principal and for the long-term operation, management, and protection of the approved compensation lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action approved by CDFG designed to protect or improve the habitat values of the compensation lands.

   ii. Withdrawal of Principal. The long-term maintenance and management fee principal shall not be drawn upon unless such withdrawal is deemed necessary by the CDFG or the approved third-party long-term maintenance and management fee manager to ensure the continued viability of the species on the compensation lands. If CDFG takes fee title to the compensation lands, monies received by CDFG pursuant to this provision shall be deposited in a special deposit fund established solely for the purpose to manage lands in perpetuity unless CDFG designates NFWF or another entity to manage the long-term maintenance and management fee for CDFG.

   iii. Pooling Long-Term Maintenance and Management Fee Funds. CDFG, or a BLM AO- and CDFG-approved non-profit organization qualified to hold long-term maintenance and management fees solely for the purpose to manage lands in perpetuity, may pool the endowment with other endowments for the operation, management, and protection of the compensation lands for local populations of desert tortoise. However, for reporting purposes, the long-term maintenance and management fee fund must be tracked and reported individually to the CDFG and BLM AO.

   iv. Other expenses. In addition to the costs listed above, the Applicant shall be responsible for all other costs related to acquisition of compensation lands and conservation easements, including but not limited to title and document review costs, expenses incurred from other state agency reviews, and overhead related to providing compensation lands to CDFG or an approved third party; escrow fees or costs; environmental contaminants clearance; and other site cleanup measures.

g. *Mitigation Security*. The Applicant shall provide financial assurances to the BLM AO and CDFG with copies of the document(s) to the USFWS, to guarantee that an adequate level of funding is available to implement the mitigation measures described herein. These funds shall be used solely for implementation of the measures associated with the Project in the event the Applicant fails to comply with the requirements specified in this measure, or shall be returned to the Applicant upon successful compliance with the requirements in this measure. The BLM AO's or CDFG's use of the security to implement required measures may not fully satisfy the Applicant's obligations under this condition. Financial assurance can be provided to the BLM AO and CDFG in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security"). Prior to submitting the Security to the BLM AO, the Applicant shall obtain the BLM AO's and CDFG's approval, in consultation with the USFWS, of the form of the Security. Security shall be provided in the amounts calculated as follows:

i. land acquisition costs for compensation land, calculated at $500/acre.

ii. initial protection and improvement activities on the compensation land, calculated at $330/acre.

iii. Long term maintenance and management fee, calculated at $1,450 an acre.

The amount of security shall be adjusted for any change in the Project footprints for each phase as described above.

h. The Applicant may elect to fund the acquisition and initial improvement of compensation lands through NFWF by depositing funds for that purpose into NFWF's REAT Account. Initial deposits for this purpose must be made in the same amounts as the security required in 3.g., above, and may be provided in lieu of security. If this option is used for the acquisition and initial improvement, the Applicant shall make an additional deposit into the REAT Account if necessary to cover the actual acquisition costs and administrative costs and fees of the compensation land purchase once land is identified and the actual costs are known. If the actual costs for acquisition and administrative costs and fees are less than $500 an acre, the excess money deposited in the REAT Account shall be returned to the Applicant. Money deposited for the initial protection and improvement of the compensation lands shall not be returned to the Applicant.

The responsibility for acquisition of compensation lands may be delegated to a third party other than NFWF, such as a non-governmental organization supportive of desert habitat conservation, by written agreement of the BLM AO and CDFG. Such delegation shall be subject to approval by the BLM AO and CDFG, in consultation with the USFWS, prior to land acquisition, initial protection or maintenance and management activities. Agreements to delegate land acquisition to an approved third party, or to manage compensation lands, shall be implemented with 18 months of the BLM's approval.

WIL-5: Raven Monitoring and Control Plan. The Applicant shall implement a Raven Monitoring and Control Plan that is consistent with the most current USFWS-approved raven management guidelines, and which meets the approval of the BLM AO in consultation with USFWS and CDFG. A raven management plan included in the Applicant's BA to BLM shall provide the basis for the final plan, subject to review, revisions and approval from the BLM AO, CDFG, and USFWS. The management plan shall include but not be limited to a program to monitor raven presence in the Project vicinity, determine if raven numbers are increasing, and to implement raven control measures as needed based on monitoring results. The purpose of the plan is to avoid any Project-related increases in raven numbers during construction, operation, and decommissioning. The Applicant shall also provide funding for implementation of the USFWS Regional Raven Management Program, as described below.

1. The Raven Plan shall:

   a. Identify conditions associated with the Project that might provide raven subsidies or attractants;

   b. Describe management practices to avoid or minimize conditions that might increase raven numbers and predatory activities;

   c. Describe control practices for ravens;

   d. Establish thresholds that would trigger implementation of control practices;

e. Address monitoring and nest removal during construction and for the life of the Project, and;

f. Discuss reporting requirements.

2. ***USFWS Regional Raven Management Program*****:** The Applicant shall submit payment to the project sub-account of the REAT Account held by NFWF to support the USFWS Regional Raven Management Program. The one-time fee shall be as described in the cost allocation methodology or more current guidance as provided by USFWS or CDFG.

WIL-6: Avian and Bat Protection Plan. The Applicant shall prepare and implement an Avian and Bat Protection Plan (sometimes referred to as "Bird and Bat Conservation Strategies") to monitor the death and injury of birds and bats from collisions with facility features such as transmission lines and tower structures (e.g., meteorological towers). The monitoring data shall be used to inform an adaptive management program that would avoid and minimize Project-related avian and bat impacts. The study design shall be approved by the BLM AO in consultation with CDFG and USFWS, and shall be incorporated into the Project's Biological Resources Mitigation, Implementation, and Monitoring Plan (BRMIMP; see Mitigation Measure VEG-2) and implemented.

The applicant shall follow APLIC guidelines for avian protection on powerlines and shall use current guidelines to reduce bird mortality from collision and electrocution with powerlines. The APLIC (2006) and USFWS recommend the following:

1. Provide 60-inch minimum horizontal separation between energized conductors or energized conductors and grounded hardware;
2. Insulate hardware or conductors against simultaneous contact if adequate spacing is not possible;
3. Use structure designs that minimize impacts to birds; and
4. Shield wires to minimize the effects from bird collisions.

WIL-7: Pre-construction Nest Surveys. Pre-construction nest surveys shall be conducted if construction activities would begin from February 1 through July 31. The Designated Biologist or Biological Monitor conducting the surveys shall be experienced bird surveyors familiar with standard nest-locating techniques such as those described in Martin and Guepel (1993). The goal of the nesting surveys shall be to identify the general location of the nest sites, sufficient to establish a protective buffer zone around the potential nest site, and need not include identification of the precise nest locations. Surveyors performing nest surveys shall not concurrently be conducting desert tortoise surveys. The bird surveyors shall perform surveys in accordance with the following guidelines:

1. Surveys shall cover all potential nesting habitat areas that could be disturbed by each phase of construction. Surveys shall also include areas within 500 feet of the boundaries of the active construction areas (including linear facilities);

2. At least two pre-construction surveys shall be conducted, separated by a minimum 10-day interval. One of the surveys shall be conducted within a 14-day period preceding initiation of construction activity. Additional follow-up surveys may be required if periods of

construction inactivity exceed 3 weeks, an interval during which birds may establish a nesting territory and initiate egg laying and incubation;

3. If active nests or suspected active nests are detected during the survey, a buffer zone (protected area surrounding the nest, the size of which is to be determined by the Designated Biologist in consultation with CDFG) and monitoring plan shall be developed. Nest locations shall be mapped and submitted, along with a report stating the survey results, to the BLM AO; and

4. The Designated Biologist shall monitor the nest until he or she determines that nestlings have fledged and dispersed; activities that might, in the opinion of the Designated Biologist, disturb nesting activities, shall be prohibited within the buffer zone until such a determination is made.

WIL-8: American Badger and Desert Kit Fox Protection. To avoid direct impacts to American badgers and desert kit fox, the Applicant shall implement the following measures:

1. ***Baseline Kit Fox Census and Population Health Survey:*** A qualified mammalogist shall complete a baseline study of desert kit fox populations on the Project site and the anticipated relocation/receiving area(s) at least 60 days prior to initiation of construction activities. The study shall characterize the demographics (e.g., size, structure, and distribution) of the kit fox population on the site and receiving areas. Pending CDFG approval, the baseline survey shall include a testing component in which the researchers trap and test a representative subsample of the population for canine distemper, and generally describe animal health on the site and receiving areas. The baseline kit fox census and health findings shall be summarized in a report that informs will be used to inform site management of kit foxes during preconstruction surveys. Alternately, the Applicant may coordinate with and fund studies by federal or State wildlife health officials (e.g., the CDFG Wildlife Investigations Lab) to establish baseline health conditions.

2. ***Prepare Desert Kit Fox Management Plan*:** At least 45 days prior to construction, the Applicant shall prepare a Desert Kit Fox Management Plan that: 1) incorporates baseline desert kit fox census and health survey findings into a cohesive management strategy that minimizes disease risk to kit fox populations; 2) provides a program for tagging, radio-tracking and monitoring of a subset of displaced kit foxes during the construction phase to understand how displacement affects regional kit fox populations; 3) specifically identifies preconstruction survey methods for kit foxes and large carnivores (e.g., badgers) in the Project area; 4) describes preconstruction and construction-phase relocation methods from the site, including the possibility for passive and active relocation from the site (and outlines identified CDFG permit and MOU requirements for active relocation), and; 5) coordinates survey findings prior to and during construction to meet the information needs of wildlife health officials in monitoring the health of kit fox populations. The Plan shall include contingency measures that would be performed if canine distemper were documented in the Project area or in potential relocation areas, and measures to address potential kit fox reoccupancy of the site (as documented at the Genesis site). The contents and requirements of the Plan shall be subject to review and approval by the BLM AO in consultation with USFWS and CDFG.

3. ***Implement Desert Kit Fox Management Plan:*** If canine distemper is not identified in the Project area or relocation areas during baseline surveys, the mitigation strategy may utilize passive means or active means with appropriate CDFG authorization to relocate kit foxes from the site. The approach below assumes that canine distemper is not detected during baseline surveys.

a. *Pre-Construction Surveys:* Biological Monitors shall conduct pre-construction surveys for desert kit fox and American badger no more than 30 days prior to initiation of construction activities. Surveys shall also consider the potential presence of active dens within 100 feet of the project boundary (including utility corridors and access roads) and shall be performed for each phase of construction. If dens are detected each den shall be classified as inactive, potentially active, or definitely active.

b. Inactive dens that would be directly impacted by construction activities shall be excavated by hand and backfilled to prevent reuse by badgers or kit fox.

c. Potentially and definitely active dens that would be directly impacted by construction activities shall be monitored by the Biological Monitor for three consecutive nights using a tracking medium (such as diatomaceous earth or fire clay) and/or infrared camera stations at the entrance.

d. If no tracks are observed in the tracking medium or no photos of the target species are captured after three nights, the den shall be excavated and backfilled by hand.

e. If tracks are observed, the den shall be progressively blocked with natural materials (rocks, dirt, sticks, and vegetation piled in front of the entrance) for the next three to five nights to discourage the badger or kit fox from continued use. After verification that the den is unoccupied it shall then be excavated and backfilled by hand to ensure that no badgers or kit fox are trapped in the den. BLM approval may be required prior to release of badgers on public lands.

f. If an active natal den (a den with pups) is detected on the site, the BLM AO and CDFG shall be contacted within 24 hours to determine the appropriate course of action to minimize the potential for animal harm or mortality. The course of action would depend on the age of the pups, location of the den on the site (e.g., is the den in a central area or in a perimeter location), status of the perimeter site fence (completed or not), and the pending construction activities proposed near the den. A 500-foot no-disturbance buffer shall be maintained around all active dens.

g. The following measures are required to reduce the likelihood of distemper transmission:

   i. No pets shall be allowed on the site prior to or during construction, with the possible exception of kit fox scat detection dogs during preconstruction surveys, and then only with prior CDFG approval;

   ii. Any kit fox hazing activities that include the use of animal repellents such as coyote urine must be cleared through CDFG prior to use, and;

   iii. Any sick or diseased kit fox, or documented kit fox mortality shall be reported to CDFG and the BLM AO within 24 hours of identification. If a dead kit fox is observed, it shall be retained and protected from scavengers until CDFG determines if the collection of necropsy samples is justified.

WIL-9: Burrowing Owl Protection and Mitigation. The Applicant shall implement the following measures to avoid, minimize and offset impacts to burrowing owls:

1. ***Pre-Construction Surveys*:** The Designated Biologist or Biological Monitor shall conduct pre-construction surveys for burrowing owls no more than 30 days prior to initiation of construction activities. Surveys shall be focused exclusively on detecting burrowing owls, and shall be conducted from two hours before sunset to one hour after or from one hour before to two hours after sunrise. The survey area shall include the Project Disturbance

Area and surrounding 500-foot survey buffer for each phase of construction in accordance with VEG-13 (*Phasing*).

2. ***Implement Burrowing Owl Mitigation Plan*:** The Applicant shall prepare and implement a final Burrowing Owl Mitigation Plan. The Plan shall be approved by the BLM AO in consultation with USFWS and CDFG, and shall:

   a. identify suitable sites as close as possible to the Project site, and within 1 mile of the Project Disturbance Areas for creation or enhancement of burrows prior to passive relocation efforts;

   b. provide guidelines for creation or enhancement of at least two natural or artificial burrows per relocated owl;

   c. provide detailed methods and guidance for passive relocation of burrowing owls occurring within the Project disturbance area; and

   d. describe monitoring and management of the passive relocation effort, including the created or enhanced burrow location and the project area where burrowing owls were relocated from and provide a reporting plan.

   e. include the following elements related to artificial burrow relocation:

      i. A brief description of the project and project site pre-construction;

      ii. The mitigation measures that will be implemented;

      iii. Potential conflicting site uses or encumbrances;

      iv. A comparison of the occupied burrow site(s) and the artificial burrow site(s) (e.g., vegetation, habitat types, fossorial species use in the area, and other features);

      v. Artificial burrow(s) proximity to the project activities, roads and drainages;

      vi. Artificial burrow(s) proximity to other burrows and entrance exposure; Photographs of the site of the occupied burrow(s) and the artificial burrows;

      vii. Map of the project area that identifies the burrow(s) to be excluded as well as the proposed sites for the artificial burrows;

      viii. A brief description of the artificial burrow design;

      ix. Description of the monitoring that will take place during and after project implementation including information that will be provided in a monitoring report.

      x. A description of the frequency and type of burrow maintenance

   f. address the following elements related to the exclusion plan:

      i. Confirm by site surveillance that the burrow(s) is empty of burrowing owls and other species by use of a fiber-optic endoscope or comparable device;

      ii. Describe the type of scope and appropriate timing of scoping to avoid impacts;

      iii. Describe occupancy factors to look for and what will guide determination of vacancy and excavation timing (e.g., one-way doors should be left in place 48 hours to ensure burrowing owls have left the burrow before excavation, visited twice daily and monitored for evidence that owls are inside and can’t escape);

      iv. Identify how the burrow(s) will be excavated (excavation using hand tools with refilling to prevent reoccupation is preferable whenever possible (may include using piping to stabilize the burrow to prevent collapsing until the entire burrow has been excavated and it can be determined that no owls reside inside the burrow);

v. Describe removal of other potential owl burrow surrogates or refugia on site; Photographing the excavation and closure of the burrow to demonstrate success and sufficiency;

vi. Describe required monitoring of the exclusion site to evaluate success and, if needed, to implement remedial measures to prevent subsequent owl use to avoid take;

vii. Identify how the impacted site will continually be made inhospitable to burrowing owls and fossorial mammals (e.g., by allowing vegetation to grow tall, heavy disking, or immediate and continuous grading) until development is complete.

3. ***Implement Avoidance Measures*:** If an active burrowing owl burrow is detected within 500 feet from the Project disturbance area the following avoidance and minimization measures shall be implemented:

   a. *Establish Non-Disturbance Buffer*: Fencing shall be installed at a 250-foot radius from the occupied burrow to create a non-disturbance buffer around the burrow. The non-disturbance buffer and fence line may be reduced to 160 feet if all Project-related activities that might disturb burrowing owls would be conducted during the non-breeding season (September 1st through January 31st). Signs shall be posted in English and Spanish at the fence line indicating no entry or disturbance is permitted within the fenced buffer.

   b. *Monitoring*: If construction activities would occur within 500 feet of the occupied burrow during the nesting season (February 1 to August 31st) the Designated Biologist or Biological Monitor shall monitor to determine if these activities have potential to adversely affect nesting efforts, and shall make recommendations to minimize or avoid such disturbance.

4. ***Acquire Compensatory Burrowing Owl Habitat*:** Consistent with CDFG mitigation guidance (CBOC, 1993), the Applicant shall acquire, in fee or in easement, at least 45 acres of land suitable to support a resident population of burrowing owls and shall provide funding for the enhancement and long-term management of these compensation lands (based on three owl pairs and four unpaired owls observed during focused surveys and 6.5 acres per pair or individual bird; to be adjusted based on final survey findings). The responsibilities for acquisition and management of the compensation lands may be delegated by written agreement to CDFG or to a third party, such as a non-governmental organization dedicated to habitat conservation, subject to approval by the BLM AO, in consultation with CDFG prior to land acquisition or management activities. Additional funds shall be based on the adjusted market value of compensation lands at the time of construction to acquire and manage habitat.

   a. *Criteria for Burrowing Owl Mitigation Lands*: The terms and conditions of this acquisition or easement shall be as described in Mitigation Measure WIL-4 [Desert Tortoise Compensatory Mitigation], with the additional criteria to include: 1) the 45 acres of mitigation land must provide suitable habitat for burrowing owls, and 2) the acquisition lands must either currently support burrowing owls or be no farther than 5 miles from an active burrowing owl nesting territory. The 45 acres of burrowing owl mitigation lands may be included with the desert tortoise mitigation lands ONLY if these two burrowing owl criteria are met. If the 45 acres of burrowing owl mitigation land is separate from the acreage required for desert tortoise compensation lands, the Applicant shall fulfill the requirements described below in this measure.

b. *Security*: If the 19.5 acres of burrowing owl mitigation land is separate from the acreage required for desert tortoise compensation lands, the Applicant or an approved third party shall complete acquisition of the proposed compensation lands within the time period specified for this acquisition (see the verification section at the end of this measure). Alternatively, financial assurance can be provided by the Applicant to the BLM AO and CDFG, according to the measures outlined in Mitigation Measure WIL-4. These funds shall be used solely for implementation of the measures associated with the Project. Financial assurance can be provided to the BLM AO in the form of an irrevocable letter of credit, a pledged savings account, or another form of security ("Security") prior to initiating ground-disturbing Project activities. Prior to submittal, the Security shall be approved by the BLM AO in consultation with CDFG and the USFWS to ensure funding. The final amount due will be determined by an updated appraisal and PAR analysis conducted as described in Mitigation Measure WIL-4.

WIL-10: Compensatory Mitigation for Mojave Fringe-toed Lizard Habitat Losses. To mitigate for permanent habitat loss and direct impacts to Mojave fringe-toed lizards the Applicant shall provide compensatory mitigation at a 3:1 ratio, which may include compensation lands purchased in fee or in easement in whole or in part, for impacts to stabilized or partially stabilized desert dune habitat (19 acres x 3 = 57.0 acres); or the three times (3X) the acreage of sand dune/partially stabilized sand dune habitat permanently impacted by the final Project footprint, whichever is greater). If compensation lands are acquired, the Applicant shall provide funding for the acquisition in fee title or in easement, initial habitat improvements and long-term maintenance and management of the compensation lands.

1. ***Criteria for Compensation Lands*:** The compensation lands selected for acquisition shall:

   a. Be sand dune or partially stabilized sand dune habitat within the McCoy Valley or Chuckwalla Valley with potential to contribute to Mojave fringe-toed lizard habitat connectivity and build linkages between known populations of Mojave fringe-toed lizards and preserve lands with suitable habitat;

   b. To the extent feasible, be connected to lands currently occupied by Mojave fringe-toed lizard;

   c. To the extent feasible, be near larger blocks of lands that are either already protected or planned for protection, or which could feasibly be protected long-term by a public resource agency or a non-governmental organization dedicated to habitat preservation;

   d. Provide quality habitat for Mojave fringe-toed lizard, that has the capacity to regenerate naturally when disturbances are removed;

   e. Not have a history of intensive recreational use or other disturbance that might make habitat recovery and restoration infeasible;

   f. Not be characterized by high densities of invasive species, either on or immediately adjacent to the parcels under consideration, that might jeopardize habitat recovery and restoration;

g. Not contain hazardous wastes that cannot be removed to the extent the site is suitable for habitat;

h. Not be subject to property constraints (i.e. mineral leases, cultural resources); and

i. Be on land for which long-term management is feasible.

2. ***Security for Implementation of Mitigation*****:** The Applicant shall provide financial assurances to the BLM AO to guarantee that an adequate level of funding is available to implement the acquisitions and enhancement of Mojave fringe-toed lizard habitat as described in this measure. These funds shall be used solely for implementation of the measures associated with the Project. Financial assurance can be provided to the BLM AO according to the measures outlined in Mitigation Measure WIL-4. The final amount due will be determined by an updated appraisal and a PAR analysis conducted as described in Mitigation Measure WIL-4.

3. ***Preparation of Management Plan*****:** The Applicant shall submit to the BLM AO, CDFG and USFWS a draft Management Plan that reflects site-specific enhancement measures for the Mojave fringe-toed lizard habitat on the acquired compensation lands. The objective of the Management Plan shall be to enhance the value of the compensation lands for Mojave fringe-toed lizards, and may include enhancement actions such as weed control, fencing to exclude livestock, erosion control, or protection of sand sources or sand transport corridors.

WIL-11: [Removed from PA/FEIS]

WIL-12. Measures to Minimize Impacts to Golden Eagles. The Applicant shall implement the following measures to avoid or minimize Project-related construction impacts to golden eagles during initial Project construction and again prior to Project decommissioning.

1. ***Annual Inventory During Construction*****:** For each calendar year during which construction will occur an inventory shall be conducted to determine if golden eagle territories occur within one mile of the Project boundaries. Survey methods for the inventory shall be as described in the *Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations* (Pagel et al., 2010) or more current guidance from the USFWS.

2. ***Inventory Data*****:** Data collected during the inventory shall include at least the following: territory status (unknown, vacant, occupied, breeding successful, breeding unsuccessful); nest location, nest elevation; age class of golden eagles observed; nesting chronology; number of young at each visit; digital photographs; and substrate upon which nest is placed.

3. ***Determination of Unoccupied Territory Status*****:** A nesting territory or inventoried habitat shall be considered unoccupied by golden eagles ONLY after completing at least 2 full surveys in a single breeding season. In circumstances where ground observation occurs rather than aerial surveys, at least 2 ground observation periods lasting at least 4 hours or more are necessary to designate an inventoried habitat or territory as unoccupied as long as all potential nest sites and alternate nests are visible and monitored. These observation periods shall be at least 30 days apart for an inventory, and at least 30 days apart for monitoring of known territories.

4. ***Monitoring and Adaptive Management Plan*****:** If an occupied nest[3] is detected within 1 mile of the Project boundaries, the Applicant shall prepare and implement a Golden Eagle Monitoring and Management Plan for the duration of construction to ensure that Project construction activities do not result in injury or disturbance to golden eagles. The monitoring methods shall be consistent with those described in the *Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations* (Pagel et al., 2010) or more current guidance from the USFWS. The Monitoring and Management Plan shall be prepared in consultation with the USFWS. Triggers for adaptive management shall include any evidence of Project-related disturbance to nesting golden eagles, including but not limited to: agitation behavior (displacement, avoidance, and defense), increased vigilance behavior at nest sites, changes in foraging and feeding behavior, or nest site abandonment. The Monitoring and Management Plan shall include a description of adaptive management actions, which shall include, but not be limited to, cessation of construction activities that are deemed by the Designated Biologist to be the source of golden eagle disturbance.

WIL-13: Measures to Minimize Wildlife Impacts from Evaporation Ponds. The Applicant shall cover the evaporation ponds prior to any discharge with 1.5-inch mesh netting designed to exclude birds and other wildlife from drinking or landing on the water of the ponds. Netting with mesh sizes other than 1.5 inches may be installed if approved by the BLM AO in consultation with CDFG and USFWS. The netted ponds shall be monitored regularly to verify that the netting remains intact, is fulfilling its function in excluding birds and other wildlife from the ponds, and does not pose an entanglement threat to birds and other wildlife. The ponds shall include a visual deterrent in addition to the netting, and the pond shall be designed such that the netting shall never contact the water. Monitoring of the evaporation ponds shall include the following:

1. ***Monthly Monitoring*****:** The Designated Biologist or Biological Monitor shall regularly survey the ponds at least once per month starting with the first month of operation of the evaporation ponds. The purpose of the surveys shall be to determine if the netted ponds are effective in excluding birds, if the nets pose an entrapment hazard to birds and wildlife, and to assess the structural integrity of the nets. The monthly surveys shall be conducted in 1 day for a minimum of 2 hours following sunrise (i.e., dawn), a minimum of 1 hour mid-day (i.e., 11:00 to 13:00), and a minimum of 2 hours preceding sunset (i.e., dusk) in order to provide an accurate assessment of bird and wildlife use of the ponds during all seasons. Surveyors shall be experienced with bird identification and survey techniques. Operations staff at the Project site shall also report finding any dead birds or other wildlife at the evaporation ponds to the Designated Biologist within one day of the detection of the carcass. The Designated Biologists shall report any bird or other wildlife deaths or entanglements within two days of the discovery to the BLM AO, CDFG, and USFWS.

2. ***Dead or Entangled Birds*****:** If dead or entangled birds are detected, the Designated Biologist shall take immediate action to correct the source of mortality or entanglement. The Designated Biologist shall make immediate efforts to contact and consult the CPM, CDFG, and USFWS by phone and electronic communications prior to taking remedial action upon detection of the problem, but the inability to reach these parties shall not delay taking

[3] An occupied nest is one used for breeding by a pair of golden eagles in the current year. Presence of an adult, eggs, or young, freshly molted feathers or plucked down, or current years' mutes (whitewash) also indicate site occupancy. Additionally, all breeding sites within a breeding territory are deemed occupied while raptors are demonstrating pair bonding activities and developing an affinity to a given area. If this culminates in an individual nest being selected for use by a breeding pair, then the other nests in the nesting territory will no longer be considered occupied for the current breeding season. A nest site is considered occupied throughout the periods of initial courtship and pair-bonding, egg laying, incubation, brooding, fledging, and post-fledging dependency of the young.

action that would, in the judgment of the Designated Biologist, prevent further mortality of birds or other wildlife at the evaporation ponds.

3. ***Quarterly Monitoring*****:** If after 12 consecutive monthly site visits no bird or wildlife deaths or entanglements are detected at the evaporation ponds by or reported to the Designated Biologist, monitoring can be reduced to quarterly visits.

4. ***Biannual Monitoring*****:** If after 12 consecutive quarterly site visits no bird or wildlife deaths or entanglements are detected by or reported to the Designated Biologist and with approval from the BLM AO, USFWS and CDFG, future surveys may be reduced to two surveys per year, during the spring nesting season and during fall migration. If approved by the BLM AO, USFWS and CDFG, monitoring outside the nesting season may be conducted by the Environmental Compliance Manager.

5. ***Modification of Monitoring Program*****:** Without respect to the above requirements the Applicant, CDFG or USFWS may submit to the BLM AO a request for modifications to the evaporation pond monitoring program based on information acquired during monitoring, and may also suggest adaptive management measures to remedy any problems that are detected during monitoring or modifications if bird impacts are not observed. Modifications to the evaporation pond monitoring described above and implementation of adaptive management measures shall be made only after approval from the BLM AO, in consultation with USFWS and CDFG.

WIL-14: [Removed from PA/FEIS]

WIL-15: In-Lieu Fees to Satisfy Compensation Requirements. The Applicant may choose to satisfy its mitigation obligations by paying an in-lieu fee instead of acquiring compensation lands, pursuant to California Fish and Game Code §§2069 and 2099 or any other applicable in-lieu fee provision, to the extent the in-lieu fee provision is found by the Fish and Game Commission to mitigate the impacts identified herein.

4.4.9 Residual Impacts after Mitigation Incorporated

The Proposed Action and the two action alternatives would have substantial impacts to desert tortoise, and possibly to Mojave fringe-toed lizard, burrowing owl, and other nesting birds and desert kit fox, which may occur on site. Relatively lesser impacts to American badger and bat species would be anticipated. As discussed in the sections above, the recommended avoidance and minimization measures as well as compensatory mitigation would effectively offset direct, indirect, and cumulative impacts to wildlife resources and assure compliance with state and federal laws. It is expected that very limited residual adverse effects would remain after mitigation measures have been applied.

4.5 Cultural Resources

4.5.1 Methodology for Analysis

4.5.1.1 Introduction

Evaluation of potential impacts of the Proposed Action and alternatives on cultural resources is based in part on review of legal responsibilities established under NEPA, the NHPA (42 USC §§4321, 4331-4335), and other relevant authorities. To carry out NEPA, the federal government has a "continuing responsibility… to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may… preserve important historic, cultural, and natural aspects of our national heritage…." (42 USC §4331(b)(4)). NEPA requires the federal agency to take a "hard look" at the impacts on cultural resources associated with a proposed action and alternatives. The analysis takes into account direct, indirect, and cumulative effects.

For purposes of NEPA, this PA/FEIS includes information gathered as part of the NHPA §106 process about historic properties and the potential effects to such properties from the proposed undertakings, i.e., the BLM's decision whether or not to issue the requested ROW grant or approve a CDCA Plan Amendment. Section 106 of the NHPA requires that the agency take into account the effects of undertakings on historic properties, defined as any district, site, building, structure, or object that is included in or eligible for inclusion in the NRHP; and to afford the ACHP a reasonable opportunity to comment. The steps of the §106 process are: (1) identification of historic properties within the APE for the proposed undertaking; (2) assessment of the proposed undertaking's potential effects on identified properties; and (3) resolution of any adverse effects. Each step requires consultation with the SHPO, interested Indian tribes, local governments, and other identified consulting parties.

Area of Potential Effects

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

1. For direct effects, the APE is defined as all areas where physical Project activities would occur, including the full extent of all Project components and alternatives. This consists of the area included within the ROW grant for the solar energy generating plant and associated facilities, roads, and transmission lines.

2. For indirect effects, the APE is defined as a 0.5-mile buffer beyond the ROW grant, to take into consideration resources whose settings could be adversely affected by the proposed Project development.

The current APE is illustrated on Figure 4.5-1.

4.5.1.2 Cultural Resources Evaluation of Historical Significance and Effects

A key part of any cultural resources analysis under NEPA and NHPA §106 is to determine whether the cultural resources located within the Project APE are historically significant. Subsequent effects assessments are made for those cultural resources that are determined to be historically significant. Cultural resources that can be avoided by construction may remain unevaluated if the values they possess are only informational in nature.

Evaluation of Historical Significance

NHPA §106

Effects on historic properties are considered during federal undertakings chiefly under NHPA §106 through its implementing regulations, 36 CFR Part 800. This includes consideration of effects on properties of traditional religious and cultural significance to Indian tribes. The §106 process requires federal agencies to consider the effects of their undertakings on any historic district, site, building, structure, or object that is included in or eligible for inclusion in the NRHP and to afford the ACHP a reasonable opportunity to comment on such undertakings, 36 CFR §800.1(a).

The BLM has made NRHP determinations of eligibility and findings of effect for all cultural resources within the APE and has requested SHPO concurrence with those determinations and findings. Two previously recorded prehistoric archaeological sites (CA-RIV-2486 and CA-RIV-3419) had been previously evaluated and determined eligible for the NRHP, and BLM concurs with the previous determinations. Seven newly recorded archaeological sites, including one prehistoric site (CA-RIV-10222) and six historic DTC/C-AMA sites (CA-RIV-10194, CA-RIV-10225, CA-RIV-10240, CA-RIV-10242, CA-RIV-10245, and CA-RIV-10246), have been evaluated and determined eligible for the NRHP. The single built environment resource within the APE, a buried water pipeline, was previously determined eligible for the NRHP as a contributing element to the Blythe Army Air Base, portions of which have been determined eligible for the NRHP. Eighty-seven archaeological and historic resources have been determined not eligible for the NRHP. Five resources have not yet been evaluated. The BLM's determinations of eligibility are shown in Appendix D, Table 4.

A MOA is being developed for this Project for the purpose of resolving adverse effects to seven historic properties. The MOA is being developed by the BLM in consultation with the ACHP, SHPO, the Applicant, Riverside County, interested Indian tribes, and any other consulting parties. The MOA will describe the adverse effects to the seven historic properties, will include measures to resolve the adverse effects, and must be executed prior to the BLM's issuance of the ROD. Specific measures to resolve adverse effects will be developed in a Historic Properties Treatment Plan (HPTP) and included as an attachment to the MOA. Execution of the MOA will conclude the §106 process. The BLM's findings of effect for all resources are shown in Appendix D, Table 5.

NEPA

NEPA establishes national policy for the protection and enhancement of the environment. Part of the function of the federal government in protecting the environment is to "preserve important historic, cultural, and natural aspects of our national heritage." Cultural resources need not be determined eligible for the NRHP as stated in the NHPA to receive consideration under NEPA. NEPA is implemented by CEQ, 40 CFR §§1500-1508. NEPA provides for public participation in the consideration of cultural resources issues, among others, during agency decision-making.

Assessing Effects to Historic Properties

BLM is using the definition of adverse effect in the §106 regulations to assess impacts of the proposed or alternative action for those cultural resources that BLM has identified as historic properties eligible for or listed in the NRHP. The §106 regulations describe an adverse effect as an effect "found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the [NRHP] in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association."1 (36 CFR §800.5(a)(1)). This consideration should apply to all the qualifying characteristics of an historic property. Adverse effects also may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative. Examples of adverse effects include, but are not limited to:

a. Physical destruction, damage, or alteration of all or part of the property;

b. Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the NRHP;

c. Introduction of visual, audible, or atmospheric elements that are out of character with the property or that alter its setting;

d. Neglect of the property, resulting in its deterioration or destruction;

e. Transfer, lease, or sale of the property.

4.5.2 Applicant Proposed Measures

APMs to address potential effects related to cultural resources were proposed; however, upon review of said measures, BLM staff determined that these measures were not sufficiently detailed to be considered in this analysis.

1 *Setting* is the physical environment of a historic property. It refers to the character of a place in which the property played its historical role. *Feeling* is the property's expression of the aesthetic or historic sense of a particular period of time. It results from the presence of physical features that, taken together, convey the property's historic character. *Association* is the direct link between an important historic event or person and a historic property. A property retains association if it is the place where the event or activity occurred and is sufficiently intact to convey that relationship to an observer. Like feeling, association requires the presence of physical features that convey a property's historic character (NPS, 1990).

4.5.3 Alternative 1: Proposed Action

4.5.3.1 Direct and Indirect Impacts

Construction

Based on the anticipated disturbance below ground and the anticipated above-ground intrusion into the flat landscape, Project activities that have the potential to affect cultural resources include:

1. General cutting and filling would disturb portions of the proposed plant site to a maximum depth of 20 feet.

2. In the solar array fields, foundations for trackers and fixed tilt mounting systems would cause ground disturbance down to a maximum depth of 7 feet below grade, and the solar module arrays would intrude into the flat landscape to a maximum height of 10 feet above grade.

3. Inverter packages and shade structures for Power Conversion Stations would reach a maximum height of 12 feet. Trenches excavated for cables would reach a depth of 3 feet. A typical building and water tank would be approximately 30 feet tall.

4. Gen-tie line monopole support towers would be a maximum of 120 feet tall with foundations 20 feet deep. Each monopole foundation would require a 50-foot square area of temporary disturbance and a 12-foot square area of permanent disturbance.

Ground-disturbing construction activities associated with the Project could directly affect cultural resources by damaging and displacing artifacts. Construction activities could diminish site integrity of historic properties and alter the characteristics that make the properties eligible for the NRHP. These historic properties, and any additional archaeological sites that are inadvertently discovered during construction, would be located within the full extent of the Project's below-grade impacts (inclusive of foundations and trenches) and above-grade impacts (inclusive of above-ground facilities). In addition, indirect effects to archaeological resources, historic architectural resources, and places of traditional cultural importance could occur. For example, increased site access could result in vandalism or unintentional harm to cultural resources. In addition, flash floods, whose effects would likely be magnified due to soil erosion caused by the proposed project, could cause disturbance of cultural resources located on or below the surface.

As a result of the literature and records searches, archival research, Native American consultation, and field investigations described in Section 3.5, a total of 114 archaeological sites (20 prehistoric, 79 historic-period, 9 multi-component, and 6 of undetermined age), have been identified within the ROW application area. One hundred and one archaeological sites are located within the APE for the Project. Of these, 9 have been determined eligible for the NRHP (CA-RIV-2846, CA-RIV-3419, CA-RIV-10222, CA-RIV-10194, CA-RIV-10225, CA-RIV-10240, CA-RIV-10242, CA-RIV-10245, and CA-RIV-10246), 87 have been determined not eligible for the NRHP, and 5 have not been evaluated for listing in the NRHP.

The BLM has found that, of the nine resources determined eligible for listing in the NRHP, seven (CA-RIV-10222, CA-RIV-10194, CA-RIV-10225, CA-RIV-10240, CA-RIV-10242, CA-RIV-10245, and CA-RIV-10246) could not be avoided by the Project and therefore would be adversely affected by this alternative by damage to and displacement of artifacts and features. Six of the NRHP-eligible archaeological sites (CA-RIV-10194, CA-RIV-1010225, CA-RIV-10240, CA-RIV-10242, CA-RIV-10245, and CA-RIV-10246) are associated with the NRHP-eligible DTC-C/AMA. The remaining two resources (CA-RIV-2846 and CA-RIV-3419) determined eligible, as well as the five unevaluated resources would be avoided by Project design and through the imposition of site management conditions. The unevaluated archaeological sites will be treated as eligible for the NRHP under Criterion D for their scientific and information potential, and their significant values would be avoided. The proposed construction, operation, maintenance, and decommissioning of the Project would permanently affect the 87 archaeological sites determined ineligible for listing in the NRHP by damaging and displacing artifacts and features. Table 4.5-1 describes the NRHP-eligible sites within the Project APE that would be adversely affected.

TABLE 4.5-1
NRHP ELIGIBLE SITES ADVERSELY AFFECTED WITHIN THE APE

Site Name	Site Type
CA-RIV-10225	Historic debris scatter (DTC/C-AMA)
CA-RIV-10194	Historic military camp site, historic debris scatter (DTC/C-AMA)
CA-RIV-10222	Prehistoric ceramic scatter
CA-RIV-10240	Historic military debris scatter, tank tracks (DTC/C-AMA)
CA-RIV-10242	Historic military debris scatter, tank tracks, ground features/emplacements (DTC/C-AMA)
CA-RIV-10245	Historic military maneuver area, tank tracks, ground features/emplacements (DTC/C-AMA)
CA-RIV-10246	Historic military maneuver area, tank tracks, ground features/emplacements (DTC/C-AMA)

The Project may affect buried archaeological resources. A geoarchaeological study conducted for the Project indicated that Holocene-age deposits, such as dry washes and eolian deposits, within the Project area have a high potential for surface and buried archaeological deposits. Late Pleistocene deposits, as well as the older fluvial deposits, have a medium to high potential for shallow subsurface deposits, and a low potential for deep subsurface deposits.

The single built environment resource within the Project area, a buried water pipeline determined eligible as a contributing element to the Army Base, is located within the proposed gen-tie line and access road route. The water pipeline was determined eligible for the NRHP as a contributing element to the NRHP-eligible Blythe Army Air Base as part of the BSPP. The Project would not affect the pipeline because the pipeline would be spanned by the gen-tie line; further, the section of the pipeline to be crossed by the gen-tie line and access road that would be used by the Project is being removed for safety concerns as part of the BSPP.

NHPA §106 government-to-government consultation with interested Indian tribes is on-going. An Ethnographic Assessment to identify sites to which Tribes may attach cultural or religious significance to, and that would be affected by the Project, is currently underway. The results of that study are not yet available. See Section 5.2.2.

Mitigation Measure CUL-1 would serve to resolve adverse effects to historic properties as a result of the Project. Provisions to resolve the adverse effects to historic properties will be described in a MOA prepared in accordance with §106. A draft of this MOA is included as Appendix L.

Operation and Maintenance

The primary potential for direct impacts to cultural resources during operation and maintenance of the Project under Alternative 1 is from unanticipated damage of known or post-review discovery of archaeological sites. During operation and maintenance, the Applicant's worker training program, use of environmental monitoring, and clear demarcation of designated access roads would reduce the risk of unanticipated impacts to cultural resources within the Project APE. Avoidance and protection of resources during the operation and maintenance phase of the project required by Mitigation Measure CUL-1 would protect cultural resources originally avoided by construction impacts. Because operation and maintenance activities would be limited to the approved construction footprint of the Project, no additional direct or indirect impacts to cultural resources would be expected during operation and maintenance.

NHPA §106 and government-to-government consultation with interested Indian tribes is on-going. An Ethnographic Assessment to identify sites to which Tribes may attach cultural or religious significance to, and that would be affected by the Project, is currently underway. The results of that study are not yet available. See Section 5.2.2.

Decommissioning

The primary potential for direct impacts to cultural resources during the decommissioning phase of Alternative 1 is from unanticipated damage of known or post-review discovery of archaeological sites. The Applicant's worker training program, use of environmental monitoring, and clear demarcation of designated access roads would reduce the risk of unanticipated impacts to cultural resources within the ROW, but outside the smaller construction footprint of the Project site. Avoidance and protection of resources (Mitigation Measure CUL-1) during the decommissioning phase of the Project would protect cultural resources originally avoided by construction impacts. Because decommissioning activities would be limited to the approved construction footprint of the Project, no additional direct impacts to cultural resources would be expected.

Project decommissioning would eliminate or substantially reduce indirect impacts to cultural resources by the removal of modern elements inconsistent with the historic setting of the area.

4.5.4 Alternative 2: Reduced Acreage

4.5.4.1 Direct and Indirect Impacts

A total of nine archaeological sites would be directly affected by the construction, operation, maintenance, and decommissioning of Alternative 2. Of the nine sites that would be directly affected under this alternative through damage to and displacement of artifacts and features, eight were determined not eligible and one (CA-RIV-10225: Historic debris scatter (DTC/C-AMA)) has been determined eligible for the NRHP based on its information potential and association with the NRHP-eligible DTC-C/AMA historic district.

NHPA §106 government-to-government consultation with interested Indian tribes is on-going. An Ethnographic Assessment to identify sites to which Tribes may attach cultural or religious significance to, and that would be affected by the Project, is currently underway. The results of that study are not yet available. See Section 5.2.2.

Alternative 2 would affect a total of 85 fewer archaeological sites when compared to the Proposed Action, including eight fewer NRHP-eligible archaeological sites. Mitigation Measure CUL-1 would serve to resolve adverse effects to historic properties as a result of Alternative 2.

4.5.5 Alternative 3: Reconfigured Gen-tie/Access Road Routes

4.5.5.1 Central Route

A total of 12 archaeological sites would be affected by construction of the Central Route. However, all of these sites have been determined not eligible for listing in the NRHP.

The Central Route would affect a total of 20 fewer archaeological sites when compared to the Proposed Action. The Central Route would affect 2 fewer NRHP-eligible archaeological sites, and 16 fewer archaeological sites that are not eligible for the NRHP. Mitigation Measure CUL-1 would serve to resolve adverse effects to historic properties as a result of the Central Route.

4.5.5.2 Western Route

A total of eight archaeological sites would be affected by the construction of the Western Route. One of these, site CA-RIV-3419, has been determined eligible for listing in the NHRP. Three additional sites have not been evaluated for NRHP eligibility. The Applicant has confirmed that these unevaluated archaeological and historic sites within the Project APE would be avoided by Project design and through the imposition of site management conditions. These archaeological sites will be treated as eligible for the NRHP under Criterion D and their significant values would be avoided.

The Western Route would affect a total of 24 fewer archaeological sites when compared to the Proposed Action. The Western Route would affect the same number of NRHP-eligible or unevaluated resources. Mitigation Measure CUL-1 would resolve adverse effects to historic properties as a result of the Western Route.

4.5.6 Alternative 4: No Action Alternative

Under this Alternative, the site would not be expected to change noticeably from existing conditions. Alternative 4 would not result in any of the impacts to cultural resources that were described for Alternative 1.

4.5.7 Cumulative Impacts

The regulations implementing §106 of the NHPA contemplate close coordination between the NEPA and NHPA processes (40 CFR §1502.25(a); 36 CFR §800.8(a)) and both require an examination of cumulative impacts. 36 CFR §800.5(a)(1) (defines an undertaking's "adverse effect" to include "reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative").

For purposes of this cumulative analysis, impacts on cultural resources could occur at any time throughout the life of the Project. The proposed construction, operation, maintenance, and decommissioning of the Project would permanently affect 94 archaeological sites by damaging and displacing artifacts and features. Seven of these archaeological sites have been determined eligible for the NRHP and are therefore automatically eligible for the CRHR. The geographic scope considered for potential cumulative effects to historic properties consists of the DTC-C/AMA historic district, described in Section 3.5.1.6.

The past, present, and reasonably foreseeable projects considered to be the cumulative scenario for this Project are shown in Tables 4.1-3 and 4.1-4. These are primarily large-scale renewable energy projects that require extensive grading and development. The cumulative projects also include several transmission lines and non-renewable energy projects, as well as residential and commercial developments. Ground disturbance and construction associated with these types of projects would be on a smaller scale than the Proposed Action and Alternatives, given the smaller acreage generally involved with these projects.

The Project would directly affect six archaeological sites that have been determined eligible for the NRHP and are associated with the DTC-C/AMA, a NRHP-eligible historic district. A MOA developed pursuant to §106 of the NHPA for the Project will include provisions to resolve the adverse effects to these archaeological sites.

The specific DTC-C/AMA archaeological sites and features that would be adversely affected are associated with the DTC-C/AMA and are part of the historic setting that defines the DTC-C/AMA historic district. Although these features are associated with the DTC-C/AMA, they are typical, and to some extent redundant, of the features that occur within the DTC-C/AMA and define the historic setting of the DTC-C/AMA. Within the range of significant values associated with features of the DTC-C/AMA, the specific features that would be affected (trash and debris scatters, tank track imprints, earthen gun emplacements, and features such as foxholes, concertina wire, and rifle pits) contribute to and help define the historic setting, but in and of themselves do not embody the same comparative level of significance as major DTC-C/AMA features, such as the Divisional camps, the Palen Pass maneuver area, or the Rice and Essex airfields. The Project, in combination with other recent authorized solar projects, would first and foremost incrementally and cumulatively affect the historic setting of the DTC-C/AMA historic district. The MOA will describe mitigation measures to manage the adverse direct, indirect, and cumulative effects of the Project on the DTC-C/AMA.

The Project's contribution to these cumulative impacts would be reduced through implementation of Mitigation Measure CUL-1

Most of the cumulative projects are on BLM or other federal land and, for this reason, are or would be subject to NEPA and the NHPA, which contain cultural resource protective requirements related to investigations, impact assessment, avoidance, and mitigation. The cumulative projects that would not be located on federal land would require discretionary state or local agency approvals, and so would be subject to CEQA; therefore, any related impacts on cultural resources would be subject to cultural resource-protective requirements based on state law to avoid or minimize these impacts. Cumulative impacts would vary by alternative only to the degree to which direct and indirect impacts would vary by alternative.

4.5.8 Mitigation Measures

CUL-1: The BLM's execution of an MOA for the proposed undertaking in accordance with the requirements of §106 of the NHPA will lead to avoidance, minimization, or mitigation of potential adverse effects to historic properties. The BLM shall prepare the MOA in consultation with the ACHP, SHPO, the Applicant, Riverside County, Indian tribes, and other identified consulting parties. The MOA will be binding on the Applicant and the proposed undertaking. An executed MOA represents the BLM's completion of the NHPA §106 process. The MOA must be executed prior to the ROD.

The MOA will contain measures to avoid, minimize, and mitigate adverse effects to historic properties and detail the process for activities to proceed in areas where historic properties are not now known to exist; procedures for treatment of unanticipated effects and post-review discoveries; recognition that BLM will comply with NAGPRA; compliance monitoring; dispute resolution; and tribal participation. Resolution of adverse effects to historic properties will be developed in consultation and may include research and documentation, data recovery excavations, curation, public interpretation, or use or creation of historic contexts.

In addition, a HPTP shall be prepared, appended to the MOA, and implemented and shall contain procedures to avoid, minimize, and mitigate effects to historic properties, and could include measures similar to the following:

a. On the basis of preliminary CRHR eligibility assessments, NRHP eligibility assessments, or existing NRHP eligibility determinations, the BLM may require the relocation of project components to avoid or reduce damage to cultural resource values. Where operationally feasible, potentially NRHP- or CRHR-eligible resources shall be protected from direct project impacts by project redesign within previously surveyed and analyzed areas.

b. Where CRHR- or NRHP-eligible or -listed historic properties cannot be protected from direct effects by project redesign, the Applicant shall comply with appropriate mitigative treatment(s) that will be detailed in the HPTP.

c. All CRHR-listed or eligible cultural resources and all NRHP-listed, eligible, and unevaluated cultural resources being treated as eligible (as determined by the BLM) that will not be affected by direct impacts, but are within 50 feet of project construction activities, shall be monitored by a qualified archaeologist. Protective fencing or other markers, at the BLM's discretion, shall be erected and maintained to protect these resources from inadvertent trespass for the duration of construction in the vicinity.

d. The HPTP shall contain a research design and a scope of work for evaluation of cultural resources and for data recovery or additional treatment of NRHP-listed or -eligible sites that cannot be avoided. Additional treatment for resources could include sample excavation and/or surface artifact collection, site documentation, curation, public interpretation, or use or creation of historic contexts. Additional content of the treatment plan will be dictated by the consultations associated with the development of the MOA.

e. Construction work within 100 feet of historic properties that require data-recovery fieldwork shall not begin until authorized by the BLM.

f. Archaeological monitoring shall be conducted by qualified archaeologists familiar with the types of historical and prehistoric resources that could be encountered within the project area, and under direct supervision of a principal archaeologist. All supervisory cultural resources personnel will be approved by the BLM through the agency's Cultural Resource Use Permitting process. A tribal cultural consultant may be required at culturally sensitive locations specified by the BLM following government-to-government consultation with Indian tribes. The HPTP shall indicate the locations where tribal cultural consultants may be required. The Applicant shall retain and schedule any required tribal cultural consultants.

g. In the event of unanticipated effects or post-review discoveries during construction, operation and maintenance, or decommissioning, procedures outlined in the MOA shall be adhered to. At a minimum, this shall include stop work orders in the vicinity of the find, recordation and evaluation of the find by a qualified archaeologist, notification of the find to BLM, and appropriate treatment measures, possibly including data recovery or avoidance.

h. The Applicant shall develop and implement a Long Term Management Plan for post-construction monitoring and condition assessment of sites in the APE which could be subject to impacts from project operation and maintenance activities.

4.5.9 Residual Impacts after Mitigation Incorporated

Implementation of Mitigation Measure CUL-1 would reduce but may not fully avoid Project-related impacts on cultural resources. Cultural resources damaged or destroyed by construction activities, even if subjected to mitigation measures, would be permanently lost from the archaeological record. These cultural resources therefore would be unavailable for future study to address future research needs when more advanced investigative techniques and methods of analysis might be available. Unavoidable adverse effects on cultural resources would result from construction, operation, maintenance, and decommissioning of all of the Project components under Alternative 1. Consultations may raise issues that cannot be resolved through the implementation of mitigation measures. Prescribed treatments may resolve adverse effects under NHPA §106. However, given the scale and potential significance of the resources identified, impacts may remain significant under NEPA despite implementation of the MOA.

4.6 Environmental Justice

4.6.1 Methodology for Analysis

To carry out the policy set forth in NEPA, the federal government has a "… continuing responsibility … to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may … achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities" (42 USC §4331(b)(5)).

This analysis of potential effects of the Proposed Action and alternatives on environmental justice issues reflects this mandate as well as that contained in Executive Order No. 12898, which requires a Proposed Action's impacts on environmental justice to be considered as part of the NEPA process if the Proposed Action would "result in impacts that are appreciably more severe in magnitude or are predominately borne by any segment of the population, for example, household population with low income or a minority population in comparison with a population that is not low income or minority." The Presidential memorandum accompanying the executive order states that "each Federal agency shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by NEPA."

To consider environmental justice issues in the context of the Project, this analysis uses a demographic screening evaluation to determine whether a minority and/or low-income population exists within two potentially affected areas. The primary area consists of a 6-mile radius beyond the site boundary and is consistent with air quality modeling of the range of the Project's air quality impacts. A secondary area consists of a 2-hour travel radius centered on the Project site and reflects the potential area from where construction workers may be brought together for construction of the Project.

The demographic screening to determine the presence of minority and low-income populations is based on information contained in two documents: *Environmental Justice: Guidance Under the National Environmental Policy Act* (CEQ, 1997) and *Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses* (USEPA, 1998). The screening process relies on 2010 Census data to determine the presence of minority and below-poverty-level populations. In addition to the demographic screening analysis, this PA/FEIS follows the steps recommended by the USEPA's guidance documents, which recommend outreach and involvement, and, if warranted, a detailed examination of the distribution of impacts on segments of the population.

The USEPA guidance (USEPA, 1998) provides a numerical threshold, 50 percent, to identify an affected community of minority population for analysis of environmental justice. The guidance also states that the percentage of minority population in the affected area should be "meaningfully greater" than that in the general population to which the affected population is compared. Although the guidance does not provide a numerical threshold for this comparison, for this analysis, the percentage of minority population is considered to be meaningfully greater than that of the general population if the percentage of minority population in the affected area is (a) greater than 150 percent of that in the general population or (b) greater than the percentage in the general population plus 50 percent of the difference between that percentage and 100 percent. Threshold (a) is used when the percentage of minority population in the general population is less than 50 percent; threshold (b) is used when that percentage is 50 percent or over. For this analysis, because minority populations are nearly all over 50 percent, including for Riverside County, an affected area with minority population has been included in the analysis of environmental justice when both conditions are met, that is, when the percentage of minority population is both over 50 percent and also meaningfully greater than that of the general population.

The USEPA guidance does not provide a numerical threshold for identifying a low-income population. It recommends use of Census data on poverty income as one indicator and other local data as may be available. This analysis uses the percentage of affected population who either as individuals or as members of families having incomes below the Census-defined poverty level. The percentage is compared to that of the general population, and the affected area is included in the analysis if the percentage of low-income population is meaningfully greater than that of the general population, based on the same thresholds as in the case of minority population.

In addition, the USEPA guidance states that the analysis of environmental justice should determine if the affected area of minority population and/or low-income population is subject to "disproportionately high and adverse human health or environmental effects" from the Project. The guidance suggests that a comparative analysis be performed on potential Project impacts to the affected population and a reference population to determine the type of high and adverse effects and the extent of disproportionality (USEPA, 1998).

The primary affected area, 6 miles around the boundary of the Project site and the transmission corridor, includes agricultural lands on northwestern Palo Verde Mesa, portions of the City of Blythe and its sphere of influence, Blythe Airport, and unincorporated communities of Mesa Verde and Nicholls Warm Springs, both located south of Blythe Airport and I-10. The secondary affected area of 2 hours' travel time generally covers eastern Riverside County and La Paz County, Arizona (see Figure 3.15-1). Small areas of Imperial, San Bernardino, and San Diego counties in California and Yuma and Maricopa counties in Arizona also are within the 2-hour travel area. However, as discussed in Section 3.15, *Social and Economic Setting*, there are no major population centers found within both the travel area and these counties. Therefore, the secondary area for this analysis is limited to CT 469 in Chuckwalla CCD (which includes Mesa Verde and Nicholls Warm Springs), Blythe CCD (which includes Palo Verde Valley and Palo Verde Mesa), the City of Blythe, La Paz County, and Colorado River Indian Reservation, which is located in both Arizona and California. The Project site is located near the eastern border of CT 469.

Minority populations within both the primary and secondary affected areas represent over 50 percent of total population, except for La Paz County (Table 3.6-1). The areas therefore are of potential concern for environmental justice analysis. However, the percentage of minority population in Riverside County as a whole is over 60 percent, due to the presence of large Hispanic and Latino populations in the county (45.5 percent). Accordingly, the percentage of minority population in the affected area is meaningfully greater than that of the county if it exceeds 80 percent (i.e., 60 percent plus half of the 40 percentage point difference with 100 percent).

Percentages of minority populations in both primary and secondary affected areas are below this threshold, with the exception of CT 9810, which is a special case because it consists only of two state prisons, Ironwood and Chuckawalla Valley. This area is outside the primary affected area, and it is screened from the Project site by the southern end of McCoy Mountains. Many effects, such as potential traffic congestion, would not pose a direct impact to these institutionalized populations. The percentage of minority population on the Colorado River Indian Reservation is 62.4 percent. Although the reservation is located in both Arizona and California, Riverside County is used as the general population for purposes of this analysis.

With respect to income, the percentage of household population (that is, not including population living in group quarters) in both primary and secondary affected areas is shown in Table 3.6-1. The percentage of Riverside County population with income below the poverty level is 16 percent. Accordingly, the percentage of population below the poverty level in an affected area is considered to be meaningfully greater than the general population if it exceeds 24 percent (i.e., 150 percent of 16 percent). The percentage of low-income population in affected areas is below this threshold, except for CT 469 (26.2 percent) and the Colorado River Indian Reservation (25.6 percent). However, the Reservation's extended geography, with distances of 15 to 50 miles from the Project site, diminishes its potential for disproportionately high and adverse impacts. Thus the affected area with respect to environmental justice would be CT 469, in particular its eastern area near the Project site.

The findings and analysis contained in the following sections of this PA/FEIS have been reviewed as part of this analysis of environmental justice issues: 4.2, *Air Resources*; 4.7, *Geology and Soils*; 4.9, *Hazards and Hazardous Materials*; 4.12, *Noise*; 4.14, *Recreation and Public Access*; 4.15, *Social and Economic Impacts*; 4.17, *Transportation and Traffic*; 4.19, *Visual Resources*; 4.20, *Water Resources*; and 4.22.2, *Transmission Line Safety and Nuisance*. Other sections (such as cultural resources, mineral resources, and lands and realty) were determined to have no potential health or environmental effects on the local populations and, therefore, were not reviewed further for potential environmental justice impacts. In reviewing each of these sections, this environmental justice analysis considers potential impacts and mitigation measures and whether a "disproportionately high and adverse" (CEQ, 1997) impact would result for the community of concern, CT 469.

4.6.2 Applicant Proposed Measures

There are no APMs to address potential effects of environmental justice.

4.6.3 Alternative 1: Proposed Action

The environmental justice review determined that during construction, operation, maintenance, closure, and decommissioning of the Project, impacts related to air resources, geology and soils, hazards and hazardous materials, noise, and transmission line safety and nuisance would be limited to a small area surrounding the Project site and would not affect the community of concern. The potential for human health and environmental impacts to result in disproportionately high and adverse impact on residents of CT 469 is described below.

Construction, Operation, and Maintenance

Project construction, operation, and maintenance may result in potential impacts on the community of concern for the following issues:

Recreational Resources

One existing OHV route on the Project site would be closed for the duration of the Project, reducing access for recreational activities. However, implementation of mitigation measures would reestablish connectivity to areas served by this route. Additionally, the area within the solar plant site boundary would be inaccessible for recreational use. However, this impact would not be disproportionately high and adverse for the community of concern because these recreational resources serve and are accessible to all residents of the local area, and alternative recreational sites are equally accessible and available to residents of CT 469 as to other users.

Socioeconomic Issues

Expenditures related to Project construction, operation, and maintenance are expected to result in positive economic impacts to the surrounding region. The need for temporary housing for construction workers may increase demand for vacant housing and for transient facilities (hotels, motels, and camping sites). The need for housing for permanent employees who may relocate to the Blythe area would increase the demand for housing to be purchased or rented. Such demand would result in positive impacts to owners of vacant and transient housing and negative impacts to those seeking to relocate into the surrounding areas by limiting the availability of remaining housing options. This is not considered to be a disproportionately high or adverse impact to populations in CT 469 because it is likely that all residential neighborhoods in the local area would be affected equally by an increase in demand for both temporary and permanent housing.

Transportation and Traffic

Construction-related traffic, both from worker commuting and transport of materials, temporarily would increase traffic levels on I-10, Mesa Drive, and the access road to the Project site. Operation and maintenance would result in a minor increase in traffic. No Project-related traffic increases would reduce the LOS of I-10 in this area or cause traffic levels that would exceed the capacity of local roadways. These impacts would not be disproportionately high or adverse for populations in CT 469.

Visual Resources

The Project would result in short-term impacts from construction lighting and visible dust plumes, and adverse effects from large-scale visual disturbance in the landscape resulting from construction activities and equipment. During operation and maintenance, the Project may be a source of adverse visual impact as a large-scale visual disturbance that would introduce industrial components and facilities to the landscape. Due to the Project site's distance from populated areas this would not be a disproportionately high or adverse impact for residents of CT 469.

Water Resources

The Project would not result in groundwater supply impacts from the use of groundwater for Project construction, operation, or maintenance, nor would it involve wastewater discharges that could affect drinking water supplies or other water bodies. It could result in water quality impacts from the accidental release of water pollutants, such as surface sediments. Mitigation measures would reduce these impacts. These impacts would not result in disproportionately high or adverse effects for residents of CT 469 because it would not affect water resources that are used only or primarily by this community.

Decommissioning

Impacts from Project decommissioning would be similar to those from Project construction, except that decommissioned materials and equipment would be transported away from the site to secondary users or to approved disposal sites.

In summary, the Project would not result in any impacts to the community of concern (CT 469) that would be disproportionately high and adverse. No environmental justice impacts would be associated with the Proposed Action.

4.6.4 Alternative 2: Reduced Acreage

4.6.4.1 Direct and Indirect Impacts

Alternative 2 would cause the same types of resource-related impacts as the Proposed Action, which are described above. However, because the solar plant site would be smaller for Alternative 2 than for the Proposed Action, the severity of several of these impacts would be reduced compared to those of the Proposed Action. For the same reasons as for the Proposed Action, Alternative 2 would cause no disproportionately high or adverse impacts on low-income populations.

4.6.5 Alternative 3: Reconfigured Gen-tie/Access Road Routes

4.6.5.1 Central Route

Direct and Indirect Impacts

The Central Route would cause the same types of resource-related impacts as the Proposed Action. The Central Route would be incrementally shorter than the proposed gen-tie line and access road route, and so it would result in a slightly reduced effects in several resource areas. Furthermore, the Central Route would be located farther from the local populated areas of CT 469. Nonetheless, there would be no substantial difference between the Central Route and the

Proposed Action, and the Central Route would not result in any disproportionately high or adverse impacts on low-income populations.

4.6.5.2 Western Route

Direct and Indirect Impacts

The Western Route would cause the same types of resource-related impacts as the Proposed Action. The Western Route would be incrementally longer than the proposed gen-tie line and access road route, and so it would result in slightly increased effects. However, the Western Route would be located farther from the local populated areas of CT 469. Nonetheless, there would be no substantial difference between the Western Route and the Proposed Action, and the Western Route would not result in any disproportionately high or adverse impacts on low-income populations.

4.6.6 Alternative 4: No Action Alternative

Because the No Action Alternative would not result in any of the impacts described in Sections 4.2 through 4.24, it would have no disproportionately high and adverse impacts to populations in the affected area. No impacts related to environmental justice would occur.

4.6.7 Cumulative Impacts

The Project would have no impact related to environmental justice; therefore, it would not cause or contribute to any cumulative impact in this regard.

4.6.8 Mitigation Measures

None required.

4.6.9 Residual Impacts after Mitigation Incorporated

Because no mitigation measures are recommended, impacts to environmental justice would be the same as discussed in Section 4.6.3, *Alternative 1: Proposed Action*.

4.7 Geology and Soils Resources

4.7.1 Impact Assessment Methodology

The Proposed Action and alternatives are evaluated qualitatively in terms of their effects on soil resources and their susceptibility to geologic and seismic hazards. Potential effects with respect to geology and soils are assessed based upon existing publications and maps completed by state and federal agencies, such as the USGS, CGS, USDA, and the CDMG. The potential for damage to proposed structures or increased risk of injury due to geologic hazards is analyzed using available data from the aforementioned sources. In addition, the severity and significance of geology and soils impacts are analyzed in the context of existing regulations and policies aimed at abating potential impacts to soil resources and from geologic and seismic hazards.

The Applicant has committed to preparing a design-level geotechnical investigation for the Proposed Action and gen-tie line, which will be necessary to inform the Project's final engineering designs and construction methods. While the scope, findings, and recommendations of the report are forthcoming, this analysis assumes that the geotechnical report will be consistent with the current state of practice in the field of engineering geology, and will provide the information necessary to design the Project in accordance with the CBC.

This includes soil characterization, calculation of wind and seismic loads, and site preparation and engineered fill requirements necessary for the proper design and installation of all Project components. This analysis is aimed at identifying potential geologic hazards that may not be adequately addressed through implementation of standard building practices as required by the CBC.

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

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

4.7.2 Applicant Proposed Measures

There are no APMs to address potential effects to geology and soil resources.

4.7.3 Alternative 1: Proposed Action

4.7.3.1 Direct and Indirect Impacts

Geologic and seismic hazards would only affect the Project during the construction and O&M phases, during which built structures could be exposed to adverse or unfavorable conditions related to soils and/or geology, or to the effects of a large regional earthquake. Following the decommissioning phase, all Project facilities would be removed, precluding impacts related to geology, soils, and/or seismicity. During the decommissioning phase, however, soil disturbances would occur that would be of a similar nature to those experienced during the construction phase, resulting in the potential to contribute to erosion impacts. For these reasons, the following discussion only pertains to the construction and O&M phases of the Project for all geology and soils impacts except erosion, which will also include the decommissioning phase.

Construction, Operation and Maintenance, and Decommissioning

Ground Rupture

The Project site does not lie within a state-established Earthquake Fault Zone, and no active or potentially active faults are mapped within the study area. The closest active fault to the site is the Coachella Valley section of the San Andreas Fault, located 58 miles southwest of the Project, and there is no substantial evidence that an otherwise active fault capable of producing fault rupture underlies the Project site.

Ground Shaking

Due to the potential for relatively large earthquakes to the west and northwest of the Project site, the site may be subject to moderately intense earthquake-related ground shaking (MMI VI) at some point during the Project's operating lifetime. As discussed in Section 3.7, *Geology and Soils*, there is a 10 percent chance that the Project area could experience a PGA value of 0.129g or greater over the next 50 years. A PGA of 0.129g could result in slight damage to older structures and would not likely result in damage to newer structures built according to current design standards. Relative to many areas in California, the Project site is distant from known, active faults and experiences less frequent and lower levels of shaking.

The highest severity of ground-shaking at the site that can be reasonably anticipated would be moderate, and structural designs would be consistent with the CBC, which requires that engineers design structures to withstand earthquake loads as well as other loads (such as wind). As stated in Chapter 2, *Proposed Action and Alternatives*, the choice of foundation design is dependent on geotechnical information about the soil and the mounting structural design. In order to ensure that the proper geotechnical information is developed, Mitigation Measure GEO-1 would require the Applicant's site-specific geotechnical report to determine the physical and chemical characteristics of the site's soils, ground response to earthquakes (see "secondary earthquake hazards," below), as well as the appropriate seismic design parameters necessary to develop adequate engineering designs and construction plans for the Project. Mitigation Measure GEO-1 would ensure compliance with the CBC, and would be sufficient to minimize risks associated with ground-shaking. Based on the site's distance from active faults and the low likelihood of strong seismic ground shaking at the site, in addition to the design and construction standards imposed by the CBC, the impact of strong seismic ground shaking would be minor and no additional mitigation is required.

Secondary Earthquake Hazards

Liquefaction. The Project area is underlain by soils composed of poorly sorted, coarse grained material, and a water table depth of greater than 100 feet below ground level (DWR, 2010 as cited in Tetra Tech EC, Inc., 2011).

Because liquefaction typically requires poorly consolidated, well sorted, and finer grained materials that are saturated within the first 40 feet beneath the ground surface, there is a very low liquefaction potential at the site. Further, the potential for lateral spreading during seismic events would be negligible as the Project site is nearly flat. Even if the soils were susceptible to liquefaction, the minimum intensity needed to trigger liquefaction in susceptible soils is generally MMI VII (strong). As discussed in Section 3.7, *Geology and Soils*, there is a very low likelihood of strong seismic ground shaking at the site.

Settlement. As discussed in Section 3.7, *Geology and Soils*, the Project site is generally underlain by unconsolidated alluvial fan deposits consisting primarily of loose grain and sand that results in variations of density among strata. These layered density variations create the potential for earthquake-induced settlement, although the magnitude of settlement would likely be minor because the maximum level of ground shaking that can be reasonably anticipated would be moderate. Nevertheless, the potential for and, if necessary, mitigation for the effects of earthquake-induced settlement of site soils during an earthquake would be addressed in a site-specific geotechnical report, as described in Mitigation Measure GEO-1. Should the geotechnical report determine based on site-specific data that mitigation is necessary, such methods might include deep foundations (driven piles; drilled shafts) for severe conditions, geogrid-reinforced fill pads for moderate severity and over-excavation and replacement for areas of minimal hazard. In either case, the effect of earthquake-induced settlement in the event of an earthquake would be minor.

Landslides. The Project site is located on the broad, gently southeast-sloping alluvial fan and alluvial fan deposits of the Palo Verde Mesa. Slope gradients on the Project site do not generally exceed 1 percent. Therefore, the potential for earthquake induced landslides to occur is negligible because the Project site is nearly flat.

Regional or Local Ground Subsidence

Because no petroleum or natural gas withdrawals take place in the Project vicinity (see Section 3.11, *Mineral Resources*), the potential for subsidence is limited to the possible effects of groundwater drawdown. The PA and Final EIS prepared for the BSPP concluded that no regional subsidence due to historic groundwater withdrawal has been reported in the vicinity (BLM, 2010). This includes localized or regional subsidence during the 1980's and 1990's, when regional groundwater extraction was at its historic maximum of approximately 48,000 AFY in the general area. The Project is expected to consume approximately 650 to 750 AF of water during the entire construction phase, plus approximately 30 to 44 AF per year of water during the entire operations phase, for a total of approximately 1,550 to 2,070 AF over the anticipated 30-year operation period of the Project. Because the groundwater withdrawal that would occur during construction, operation, and maintenance of the Project represents a minor fraction of the historic maximum, which is not known to have caused subsidence, Project-related groundwater withdrawals are not expected to result in regional or local subsidence issues. Therefore, the potential for local or regional ground subsidence resulting from groundwater extraction (no petroleum or natural gas withdrawal occurs in the Project vicinity) is considered to be very low and no mitigation is required.

Hydrocompaction

As discussed in Section 3.7, *Geology and Soils*, given the depositional environment of the Palo Verde Mesa, soil units within the Project site may be subject to hydrocompaction (also referred to as collapsible soils). Hydrocompaction of site soils would not present a life or safety hazard to site workers or the public, but may cause damage to proposed facilities if hydrocompaction-related effects are not anticipated or considered in site preparation and foundation designs for the Project. Like expansive soils, described below, soils that experience hydrocompaction are more typically a problem for underground linear appurtenances or flat, rigid foundations where greater surface areas are in contact with collapsible soils, such as might be the case with building foundations and concrete equipment and tower pads. Steel posts for the solar trackers and gen-tie line monopoles that are direct buried are less likely to be adversely affected by hydrocompaction. Regardless, the potential adverse effects of hydrocompaction of site soils during the construction and O&M phases of the Project would be adequately addressed through the compaction and grading requirements of the CBC and any more stringent or specific recommendations provided by the Applicant's project-specific geotechnical report described in Mitigation Measure GEO-1. Typical building practices might include moisture conditioning of the soil to achieve maximum stability, ensuring deleterious materials are removed from soil prior to being placed or moved on-site, and/or over-excavating existing soils and placing structural foundations on a mat of artificial fill compacted to appropriate design specifications. These types of measures, which are standard in the engineering practice and required through building and construction codes, ensure that small ground movements such as long-term soil consolidation or movements due to subsidence or collapsible soils do not damage or deteriorate building foundations and/or other structural components of the Project.

Expansive Soils

According to Table 3.7-2, soils within the Project vicinity are primarily granular soils that do not contain high clay concentrations. Because these soils lack high clay content and are predominantly sandy, they exhibit low shrink/swell potential. Expansive soils are more typically a problem for underground linear appurtenances or flat, rigid foundations where greater surface areas are in contact with expansive soils, such as might be the case with building foundations and concrete equipment and tower pads. Steel posts for the solar trackers and gen-tie line monopoles that are direct buried are less likely to be adversely affected by expansive soils, if present. In either case, the geotechnical report to be completed by the Applicant and described in Mitigation Measure GEO-1 would provide site-specific Project design and construction recommendations, such as over-excavation of soil and use of engineered fill for earthwork, or extending building foundations beneath the zone of water fluctuation. Expansive soils, if present, would be adequately addressed through standard engineering and construction practices and implementation of geotechnical recommendations, if applicable.

Corrosive Soils

Fine grain, moist soils containing sulfides may be present at the Project site and could be corrosive to buried structures. Long-term corrosion can cause damage to buried structures such as foundations and subgrade utilities, and if left unaddressed, can cause serious impairments to the structures function and ability to withstand typical loads. Adequate site preparation as discussed above, which includes foundation placement of a mat of engineered fill, is likely to reduce the risk of corrosion for many of the proposed structures. In addition, for monopoles along the gen-tie line, the Applicant would use self-weathering steel composed of a special alloy that forms a protective coating oxide and prevents further corrosion. The effects of corrosive soils would be further mitigated, if necessary, by incorporating any corrosion protection recommendations provided in the geotechnical report, as described in Mitigation Measure GEO-1.

Erosion and Soil Loss

The Project site contains soils that could be susceptible to wind and water erosion during construction, operation and maintenance, and decommissioning. The preliminary stages of construction and decommissioning, especially site grading, excavation, and soil stockpiling, would leave loose soil exposed to the erosive forces of rainfall and high winds. Further, the operation of heavy machinery and vehicles over access roads, staging areas, and construction work areas is likely to compact desert soils and decrease their capacity to infiltrate stormwater, resulting in greater levels of surface runoff in response to rainfall than might otherwise occur under natural conditions. Although the Project would minimize on-site grading and preserve major features of existing on-site drainages, the installation of proposed facilities, including roads, fencing, and solar arrays, could result in erosion and soil loss if not properly mitigated.

Wind Erosion. As part of the analysis of impacts to soil resources for the BSPP, located immediately south of the Project site, an analysis of soil loss under existing conditions, the construction phase, and the O&M phase of the project for each of the three soil series mapped on the project site was conducted (BLM, 2010). While soil conditions can vary within short distances, the Project is underlain by the same soil units as the BSPP, and therefore the analysis is relevant in informing the change in erosion rates that may be caused by the Project during both the construction and operation and maintenance phases. The potential for soil loss by wind erosion on the BSPP site was estimated using the Wind Erosion Prediction System for pre-development (undisturbed), during construction, and operational conditions. The wind erosion values calculated for the site indicate that during construction, only the Aco-Rositas-Carrizo Series type soils would exceed undisturbed conditions, and by a mere 2 percent (BLM, 2010). These soils underlie the gen-tie line that follow along the eastern border of the BSPP, and do not underlie the Project solar plant site. All other soil units had wind erosion rates that were reduced in intensity compared to existing conditions under both the construction and operation and maintenance phases of the BSPP (BLM, 2010).

While the above results were specific to the BSPP site, due to similarities in the type of construction activities and the underlying soil type, wind erosion rates within the Project site would likely show similar minor adverse changes. One possible exception, however, would be in areas where desert pavement is disturbed. Desert pavement, which is most likely to be coincident with the Gunsight-Rillito-Chuckawalla Series type soils, was likewise present on the BSPP site, and the wind erosion analysis acknowledged that disturbance of the protective layer of pebble- to cobble-size material could increase wind erosion rates comparable to the Aco-Rositas-Carrizo Series type soils by exposing the underlying layer of finer-grained material. The origins, characteristics and processes that create desert pavement are further discussed in Section 3.7, *Geology and Soils*. Without protective measures, disturbance of desert pavement, which is limited to the western third of the site, could cause a noticeable and possibly substantial increase in wind erosion rates during construction.

Wind erosion caused by the Project is an issue addressed in the air quality analysis due to the potential for wind erosion to cause increases in fugitive dust emissions (PM 10 and PM2.5). As described in Section 4.2, *Air Resources*, potential increases in fugitive dust emissions would be controlled by numerous APMs, including the use of soil binders along unpaved access roads, watering graded areas on the solar plant site and the off-site linear corridors, treatment of soil stockpiles with soil stabilizers or protective covers, vehicle speed limits, use of windbreaks to minimize wind speeds, and minimizing the disturbance of desert pavement to the extent feasible. These measures, among others, are further described in APMs Air-1, which would reduce construction-generated air quality impacts, and APM Air-2, which would reduce operation- and maintenance-related air emissions. The analysis provided in Section 4.2, *Air Resources*, is equally applicable to the issue of soil loss via wind erosion, and the APMs proposed are likewise equally effective at reducing potential impacts.

Water Erosion. The potential for soil loss by water erosion (sheet and rill erosion) on the BSPP site was estimated using the Universal Soil Loss Equation for pre-development, during construction, and operational conditions (BLM, 2010). Modeling shows soil erosion rates on the BSPP site would increase for both construction and operation on all soil series except on the Aco-Rositas-Carrizo Series type soils during the operations phase, which would revert to its undisturbed erosion rate. Increased rates are due to soil compaction and the resulting increase in bulk density. Compaction of the soil would decrease soil infiltration rates causing greater runoff, especially during high intensity, short duration rainfall events. While the above results were specific to the BSPP site, due to similarities in the type of construction activities and the underlying soil type, water erosion rates within the Project site would be similar. Without protective measures, soil disturbance and compaction, which could occur wherever soil moving activities and access roads are proposed, could cause a noticeable and possibly substantial increase in water erosion rates during low frequency, high intensity rainfall events.

The potential adverse effect of water issues is comprehensively addressed in Section 4.20, *Water Resources*. While the discussion in Section 4.20, *Water Resources* is primarily concerned with changes in hydrology and adverse water quality impacts, the potential for surface water runoff to entrain soils and sediment is a primary concern from a water quality perspective. Consequently, the analysis provided in Section 4.20, *Water Resources* is equally applicable to the issue of erosion and soil loss and the mitigation proposed is likewise equally effective at reducing potential impacts. Mitigation Measure WATER-1 would reduce or avoid potential impacts with respect to construction and decommissioning activities, whereas Mitigation Measure WATER-3 would reduce the Project's effect on long-term erosion rates.

4.7.4 Alternative 2: Reduced Acreage

4.7.4.1 Direct and Indirect Impacts

Alternative 2 would cause the same types of geology and soil-related impacts as the Proposed Action, i.e., potential for damage to Project facilities resulting from adverse soil and seismic conditions for the duration of the Proposed Action, such as expansive soils, hydroconsolidation, corrosive soils, and others. The severity and potential for impacts to Project facilities resulting from adverse soil conditions and seismic-related ground failures would be similar to the Project because the same types of facilities would be built on the same soil types; however, due to the reduced size of this Alternative, there would be fewer structures that would be susceptible to such an impact. Therefore, the likelihood that a Project facility would be affected would be reduced.

The severity of the impact associated with wind and water erosion would be reduced. Because the Alternative 2 solar field would reduce by half the amount of ground disturbance, and because the area to be preserved consists of desert pavement (which is largely confined to the Aco-Rositas-Carrizo soil unit shown in Figure 3.7-2), the potential for wind and soil erosion associated with disturbance of desert pavement would be reduced. Further, because Alternative 2 would require less water use during all phases, the potential for impacts associated with ground subsidence would be reduced.

While Alternative 2 would reduce impacts compared to the Proposed Action, impacts related to adverse soil and seismic conditions could still be considered adverse. Therefore, the same Mitigation Measures would be required as for the Proposed Action.

4.7.5 Alternative 3: Reconfigured Gen-tie/Access Road Routes

4.7.5.1 Central Route

Direct and Indirect Impacts

The Central Route would cause the same types of geology and soil-related impacts as the Proposed Action, but may result in slight differences in the potential for impacts associated with the underlying soil type, such as expansive soils, hydroconsolidation, and corrosive soils, or with seismic hazards. The Central Route would be shifted to the west relative to the proposed gen-tie line and access road and would be slightly shorter, resulting in fewer structures that would be susceptible to such impacts. However, the differences are likely to be minor since the Central Route would traverse similar soil units to those underlying the Eastern Route. Further, due to its slightly reduced ground disturbance, the potential for wind and soil erosion associated with disturbance of desert pavement would be reduced. Nonetheless, there would be no substantial difference between the Central Route and the Eastern Route.

4.7.5.2 Western Route

Direct and Indirect Impacts

The Western Route would cause the same types of geology and soil-related impacts as the Eastern Route, which is proposed as part of the Project, but may result in slight differences in the potential for impacts associated with the underlying soil type, such as expansive soils, hydroconsolidation, and corrosive soils, or with seismic hazards. The Western Route would be slightly longer than the Eastern Route, resulting in more structures that would be susceptible to such impacts. However, the differences are likely to be minor since the Western Route would traverse similar soil units to those underlying the proposed gen-tie line and access road route. Further, due to its slightly increased ground disturbance, the potential for wind and soil erosion associated with the Western Route's disturbance of desert pavement would be increased relative to the Proposed Action. Nonetheless, there would be no substantial difference between the Western Route and the Proposed Action.

4.7.6 Alternative 4: No Action Alternative

4.7.6.1 Direct and Indirect Impacts

Throughout the Project site there is the potential for relatively large earthquakes to occur to the west and northwest that would generate moderately intense seismic ground shaking. This seismic activity could possibly result in earthquake-induced settlement. Soils underlying the site may be subject to hydrocompaction and may contain corrosive properties, although no structures would be built that would be exposed to these hazards. Erosion would occur in a manner consistent with existing conditions relating to wind and flash flooding. Alternative 4 would cause no change in baseline conditions relative to site geology and soils, and would not result in any built facilities that would be exposed to geologic hazards. This alternative also would cause no contribution to any cumulative impact related to erosion and/or land subsidence. Compared to the Proposed Action, Alternative 4 would result in reduced impacts.

4.7.7 Cumulative Impacts

Potential cumulative impacts include soil erosion and soil subsidence because the Project would use a groundwater basin shared by many of the projects in the cumulative scenario, and because multiple projects in the cumulative scenario also could result in cumulative effects with respect to soil loss and erosion. These potential cumulative impacts would apply to the construction, O&M, and decommissioning phases of the Project. All other geology and soils issues (such as strong seismic ground shaking, seismically induced ground failure, collapsible soils, and expansive soils) relate to local, site-specific soil conditions, ground response to earthquakes, and the potential for adverse soil conditions to damage the Project's structural components. The presence of other projects in the cumulative scenario would have no affect on either the severity or the probability of geotechnical challenges associated with seismicity and/or the character of underlying soils. Such issues are site-specific and unaffected by the presence of other projects in the cumulative scenario. Therefore, only potential soil erosion and soil subsidence issues are analyzed in this discussion.

For soil erosion, applicable projects listed in Tables 4.1-3 and 4.1-4 would include those that are located in the same watershed as the Project. The greatest potential for cumulative impacts with respect to soil erosion would be if either the construction or decommissioning phases of projects within the geographic scope were to occur concurrently. However, the O&M phase of projects also are included in the temporal scope of cumulative impacts because minor alterations in topography and the addition of impervious surfaces could combine to produce cumulative impacts. For soil subsidence, applicable projects listed in Tables 4.1-3 and 4.1-4 would include all projects that would draw groundwater from the PVMGB. The temporal scope of impacts would include all phases of the projects, because some level of groundwater is expected to be needed for construction and decommissioning activities (e.g., dust suppression) and O&M needs (e.g., panel washing and water service for O&M building).

Adjacent projects that would contribute to local erosion-related impacts if constructed include enXco McCoy, BSPP, the Palo Verde Mesa Solar Project, and the Blythe Airport Solar I Project. Projects that are listed in the cumulative analysis for groundwater levels and groundwater supplies in Section 4.20, *Water Resources*, include the Blythe Energy Project II, Blythe PV Project, BSPP, Desert Quartzite Solar Farm, Gypsum Solar, and the enXco McCoy solar project.

Soil subsidence could occur either at the Project site or a neighboring project site if the combined amount of groundwater use associated with these projects results in a lowering of the groundwater levels sufficient to result in ground subsidence. As discussed in Section 4.20, *Water Resources*, a groundwater model was completed in support of the analysis of groundwater supply and drawdown. Results from the cumulative model analysis predict that drawdowns in the modeled cumulative scenario would not exceed 1 foot, and that the contour of 0.01 foot drawdown is predicted to remain within the PVMGB at the end of the operation and maintenance period. Further, the modeling results indicate that the Project’s groundwater usage in combination with that of the cumulative projects would total 131,000 AF of water over the construction and operation and maintenance periods, and would not result in a cone of depression (see Figure 4.20-8). No regional subsidence due to historic groundwater withdrawal has been reported in the vicinity, even during the 1980’s and 1990’s, when regional groundwater extraction was at its historic maximum of approximately 48,000 AFY, and the amount of cumulative groundwater drawdown in the cumulative scenario is negligible.

Project construction, O&M, and decommissioning of the Project or an alternative could contribute to cumulative soil erosion impacts. However, SWPPPs like the one recommended in Mitigation Measure WATER-1 and Comprehensive Drainage, Stormwater, and Sedimentation Control Plans like the one recommended in Mitigation Measure WATER-3 (see Section 4.20, *Water Resources*) are standard construction industry practice as well as legal requirements for projects over specified thresholds.

4.7.8 Mitigation Measures

The following Project-specific mitigation measures were developed to reduce and/or avoid potential geology and soil impacts associated with the Project and alternatives.

GEO-1: Conduct geotechnical studies to assess soil characteristics and aid in appropriate foundation design. The Applicant and/or its contractor shall perform a design-level geotechnical study that includes subsurface exploration and material testing necessary to determine the CBC seismic design category and site soil class for which each of the Project components must be designed. The geotechnical study shall identify the presence, if any, of potentially adverse soil conditions such as liquefiable soils, expansive soils, corrosive soils, and soils that may settle or experience hydrocompaction. Based on the nature, location and severity of adverse soil conditions, the geotechnical study shall recommend appropriate and feasible design features necessary to reduce the potential for liquefiable, expansive, corrosive or collapsible soils to adversely affect MSEP facilities. Such measures might include use of corrosion-resistant materials and coatings; use of non-corrosive, non-expansive backfills; use of cathodic protection systems; soil-treatment processes; redirection of surface water and drainage away from expansive foundation soils; and/or any other combination of soil preparation methods or foundation designs necessary to avoid or reduce the adverse affects of soils on Project structures.

Studies shall be carried out by a registered geologist or certified geotechnical engineer, and shall conform to industry standards of care and ASTM standards for field and laboratory testing. For completeness and direct correlation to the Proposed Action, the Applicant shall provide the geotechnical consultant with the most recent copy of the project case exhibit (tract map, parcel map, plot plan, etc.) for incorporation into the report. Furthermore, the consultant shall plot all appropriate geologic and geotechnical data on this case exhibit and include it as an appendix/figure/plate in their report. Study results and proposed solutions shall be provided for review and approval to the BLM at least 60 days before final Project design.

WATER-1: Stormwater Pollution Prevention Plan. This measure would reduce or avoid potentially adverse impacts with respect to stormwater pollution resulting from construction and decommissioning activities. See Section 4.20, *Water Resources*.

WATER-3: Comprehensive Drainage, Stormwater, and Sedimentation Control Plan. This measure would reduce the Project’s effect on long-term erosion rates by implementing design measures to avoid increased stormwater flows or altered drainage patterns. See Section 4.20, *Water Resources*.

4.7.9 Residual Impacts after Mitigation Incorporated

Following implementation of the BMPs described in WATER-1 and WATER-3 and mitigation measures provided in Section 4.7.8, all adverse impacts on geology and soil resources resulting from construction, O&M, and decommissioning of the Project and alternatives would be avoided or substantially reduced.

4.8 Greenhouse Gas Emissions and Global Climate Change

4.8.1 Methodology for Analysis

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

4.8.1.1 GHG Emissions

The majority of the technical information related to Project GHG emissions estimates was prepared by AECOM for the Applicant (AECOM, 2012) and peer reviewed by BLM staff and consultants. In addition, to supplement the technical GHG emissions information prepared by AECOM, ESA prepared indirect GHG emissions estimates for water usage during construction and operation and for electricity usage during construction (see Appendix H). The methods used to estimate Project construction and operation emissions are described below.

Construction Emissions

Off-road Equipment Exhaust

The combustion of fuel to provide power for the operation of various equipment results in the generation of GHGs. The CO_2 emissions from off-road equipment use were estimated using the same methodology described for criteria pollutants from construction equipment (see Section 4.2.1.1, *Construction Emissions*). The methodology employs the URBEMIS model, which calculates only CO_2 emissions. Emissions of N_2O and CH_4 were calculated outside of URBEMIS using the CO_2 emissions calculated by URBEMIS and CO_2, N_2O and CH_4 emission factors obtained from The Climate Registry (TCR) (2011) for diesel fuel combustion. Emission factors for CO_2 are in units of kilograms per gallon and emission factors for N_2O and CH_4 are provided in terms of grams per mile. These factors were converted to grams per gallon units by assuming a fuel efficiency of 20 miles per gallon for cars and light trucks and 8.0 miles per gallon for medium and heavy trucks. Emissions of N_2O and CH_4 were then calculated as a product of CO_2 emissions and the ratio of the N_2O or CH_4 emission factors to the CO_2 emission factor. N_2O and CH_4 emissions were multiplied by their respective global warming potentials and added to the CO_2 emissions to obtain CO_2e emissions. Details of the calculations, including a summary of

GHG emissions, are provided in Attachment 1-E of the technical report, *Summary of Construction GHG Emissions* (AECOM, 2012).

Vehicle Exhaust

GHG emissions from motor vehicles used during construction were estimated outside of URBEMIS using the same methodology described for criteria pollutants from construction vehicles (see Section 4.2.1.1, *Construction Emissions*). Since the EMFAC2007 model provides emission factors only for CO_2 emissions, emission factors for N_2O and CH_4 for different vehicle types were obtained from CARB's *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions*, Appendix A, Table 8. GHG emission factors were calculated as CO_2e in kilograms per mile by multiplying the N_2O and CH4 emission factors by their respective global warming potential and adding them to the CO_2 emission factors. CO_2e emission factors are provided in Attachment 1-C of the technical report, *Construction Vehicle Emissions*, Tables 1-A and 2 (AECOM, 2012). Monthly GHG emissions from vehicles used during different phases of construction are provided in the technical report Attachment 1-C, *Construction Vehicle Emissions*, Tables 3 through 8, and a summary of monthly GHG emissions from vehicles is provided in Table 2 of Attachment 1-E, *Summary of Construction GHG Emissions* (AECOM, 2012).

During construction, GHG emissions would be generated by motor vehicles within the MDAB (e.g., construction worker trips to and from the project site and deliveries of construction materials from points within the MDAB). It is currently undecided from where the PV panels would be obtained for the Project; for example, they could come from Arizona or be imported through the Port of Long Beach. In order to provide a conservative estimate of GHG emissions anywhere within California, GHG emissions outside of the MDAB were estimated based on an assumed round trip for delivery of PV panels from the Port of Long Beach. The GHG emissions due to these PV panel delivery trips were broken down into the round trip miles outside the MDAB from Long Beach to the MDAB boundary, and within the MDAB related to round trips from the boundary to the Project site. Vehicle miles traveled per vehicle type for each phase of construction were provided by the Applicant's engineering contractor and are included in the technical report Tables 5 through 10 of Attachment 1-E, *Summary of Construction GHG Emissions* (AECOM, 2012).

Indirect Emissions

To supplement the AECOM technical report, ESA prepared indirect emissions estimates for energy consumption that would be associated with the temporary electric distribution line that would be used at the solar plant site during construction (ESA, 2012). In addition, ESA estimated indirect GHG emissions that would be associated with water use for dust control and other construction activities that would be associated with construction of the Project using information identified in Sections 2.3.1.4.8, *Distribution Power Line*, and 2.3.1.4.9, *Water Supply and Usage*, and emission and use factors from the CEC and TCR (ESA, 2012; CEC, 2005; and TCR, 2011). Based on CEC use factors and the assumption that water would be obtained from wells at the Project site, it is estimated that 250 kWh of electricity would be required for every million gallons of water used.

Operation and Maintenance Emissions

Vehicle Exhaust

The CO_2 emissions from motor vehicles used during operation were estimated using the same methodology described above for GHG emissions from construction phase motor vehicles. Details of the calculation are provided in AECOM's technical report, Attachment 2-C, *Operation GHG* (AECOM, 2012).

Emergency Generator Exhaust

GHG emissions would be generated during the testing and maintenance of two on-site 35-horsepower diesel-powered emergency generators. GHG emissions from the diesel generators were calculated using the estimated annual fuel usage and emission factors obtained from The Climate Registry for diesel fuel combustion (TCR, 2011). Annual fuel usage is based on 50 hours per year of operation, the power rating of the diesel engines, and the brake-specific fuel consumption, heating value, and density of diesel. Details of the fuel usage calculations are provided in AECOM's technical report Attachment 2-A, *Operation Equipment* (AECOM, 2012).

Circuit Breaker Fugitive SF_6

Emissions of SF_6 could be released into the atmosphere due to equipment failure or leakage from electrical equipment such as circuit breakers that contain SF_6. The calculations for SF_6 emissions were based on the conservative assumptions that there would be two 230 kV circuit breakers and two 34.5 kV circuit breakers installed for each of the two proposed power units. The 230 kV breakers were assumed to contain 270 pounds of SF_6, while the 34.5 kV breakers were assumed to contain approximately 100 pounds of SF_6. The AECOM technical report indicates that each of the circuit breakers would be hermetically sealed to prevent the escape of SF_6 into the atmosphere (AECOM, 2012). It should be noted that emissions of SF_6 from a hermetically sealed circuit breaker can only occur due to equipment failure as there is no ability for the user to refill or extract SF_6 due to the factory seal. CARB defines hermetically sealed circuit breakers as "designed to be gas-tight and sealed for life" (CARB, 2011). Nonetheless, an assumed leak rate of 0.5 percent was used for estimates to provide a conservative upper bound estimate of fugitive SF_6. It was also assumed that SF_6 is weighted at a global warming potential of 23,900 based on a 100-year time horizon, which is consistent with state, federal, and international standards. Details of the fugitive SF_6 calculation are provided in AECOM's technical report Attachment 2-D, *Operation GHG* (AECOM, 2012).

Indirect Emissions

Electric power would be drawn from the grid for day-to-day operation of the facility including the on-site operations and maintenance building and other Project components. GHG emissions from electricity use were estimated by multiplying the expected annual electricity consumption provided by the Applicant's engineering consultant by the CO_2, N_2O, and CH_4 emission factors obtained from TCR (TCR, 2011). N_2O and CH_4 emissions were multiplied by their respective global warming potential and added to the CO_2 emissions to obtain CO_2e emissions. Details of the electricity use indirect emissions calculation are provided in AECOM's technical report, Attachment 2-D, *Operation GHG* (AECOM, 2012). In addition, ESA estimated indirect GHG emissions that would be associated with operation and maintenance water use for panel washing and other activities that would be associated with the Project using information identified in Section 2.3.1.4.9, *Water Supply and Use*, and emission and use factors from the CEC and TCR (ESA, 2012; CEC, 2005; and TCR, 2011). As discussed under the methods for indirect emissions during construction, it is estimated that 250 kWh of electricity would be required for every million gallons of water used.

Carbon Sequestration

The rate of existing carbon sequestration that occurs at the Project site has been estimated under the assumption that the ongoing natural carbon uptake by desert vegetation is equivalent to 1.48 metric tons of CO_2 per acre per year (see Section 3.8.1.2, *Greenhouse Gases*). This rate of carbon uptake is based on a study of Mojave Desert vegetation (Wohlfahrt et al., 2008). The acreage of desert vegetation that would be disturbed by the Project and alternatives were obtained from Section 4.3, *Biological Resources – Vegetation*.

Fossil Fuel-Based Energy Displacement

The reduction in GHG emissions by electricity displacement was estimated by assuming that the solar power would displace electricity generated by dispatchable natural-gas fired combined-cycle power plants and that the Project would have a generation capacity factor of 26 percent for an average daily generation period of approximately 6 hours. A natural gas heat rate of 6,940 British thermal units per kilowatt hour (BTU/kWh) for energy generation by combined-cycle power plants and emission factors from TCR were used to estimate the displaced emissions. Details of the fossil fuel-based energy displacement emissions calculation are provided in AECOM's technical report Attachment 2-D, *Operation-Related GHG Emissions*, Table 4 (AECOM, 2012).

4.8.1.2 GHG Emissions Impact Analysis

Independent of NEPA, but pursuant to 40 CFR Part 98, *Mandatory Reporting of Greenhouse Gases Rule,* USEPA requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 metric tons of CO_2e emissions per year (USEPA, 2011b). In addition, pursuant to 40 CFR Part 52, *Proposed Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule*, the USEPA recently mandated to apply PSD and Title V requirements to facilities whose stationary source CO_2e emissions exceed 100,000 tons per year (USEPA, 2011a). For the purposes of this NEPA analysis, estimated GHG emissions for the Project and alternatives are compared to the federal GHG mandatory emissions reporting threshold of 25,000 metric tons per year to determine whether the GHG emissions would contribute substantially to global climate change.

4.8.1.3 Climate Change

Agencies under the DOI are required by Secretarial Order No. 3289 (September 14, 2009) to consider potential impacts 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. In addition, climate change is expected to result in a suite of additional potential changes that could affect the natural environment, in a manner that is relevant to the Project. The potential for climate change to affect the Project is discussed qualitatively.

4.8.2 Applicant Proposed Measures

There are no APMs to address potential effects from GHGs and climate change.

4.8.3 Alternative 1: Proposed Action

4.8.3.1 Direct and Indirect GHG Emissions Impacts

Construction

Table 4.8-1 shows the GHG emissions estimated to be generated by Project construction activities for each calendar year during the Project's 46-month construction period. As noted in Section 4.8.1, *Methodology for Analysis*, the GHG equipment and vehicle exhaust emissions estimates include those that would be generated within the MDAB (e.g., on-site emissions generated at the solar plant site) as well as those that would be outside of the MDAB but within California (e.g., delivery of PV panels from Port of Long Beach). As shown in Table 4.8-1, Project-related annual CO_2e construction emissions would vary between 2,315 metric tons and 4,130 metric tons, and over the 46-month construction period, the Project would generate a total of 12,703 metric tons CO_2e. Refer to Section 4.8.1, *Methodology for Analysis*, for a discussion of the methods used to estimate each of the construction emissions sources.

TABLE 4.8-1
PROPOSED ACTION CONSTRUCTION EQUIPMENT AND VEHICLE GHG EXHAUST EMISSIONS

	Annual CO_2e Emissions (metric tons)[a]		
Construction Year	**Equipment and Vehicle Exhaust**	**Indirect Electricity and Water Use**	**Total Emissions**
Year 2013	2,307	8	2,315
Year 2014	3,127	8	3,135
Year 2015	3,116	7	3,123
Year 2016	4,122	8	4,130
Total Project	**12,672**	**31**	**12,703**

NOTE:

[a] Emissions associated with equipment and vehicle exhaust were estimated by AECOM (2012) and indirect emissions associated with electricity and water use were estimated by ESA (2012).

SOURCES: AECOM, 2012 and ESA, 2012.

Operation and Maintenance

Direct and Indirect Emissions

Table 4.8-2 shows the estimated annual GHG emissions that would be directly and indirectly generated each year related to operation and maintenance of the Project for fossil fuel combustion sources, fugitive SF_6 emission sources, and indirect emissions related to electricity and water usage. The total estimated annual operation and maintenance emissions that would be associated

TABLE 4.8-2
PROPOSED ACTION ANNUAL GHG EMISSIONS FROM OPERATIONS

Operational Sources[a]	Annual CO_2e Emissions (metric tons)
Fossil Fuel Combustion	112
Fugitive SF_6 Emissions	80
Indirect Emissions – Electricity and Water Use	25
Total Annual Operation GHG	**217**

NOTE:
[a] Emissions associated with fossil fuel combustion, fugitive SF_6, and indirect emissions associated with electricity use were estimated by AECOM (2012) and indirect emissions associated with electricity for water use was estimated by ESA (2012).

SOURCES: AECOM, 2012; ESA, 2012.

with the Project is 217 metric tons CO_2e. For a discussion of the methods used to estimate each of the operation and maintenance emissions sources, see Section 4.8.1, *Methodology for Analysis*.

Carbon Sequestration

In addition to direct and indirect emissions of GHGs, the Project would result in the clearing of land and complete removal of vegetation over most of the Project site. This would reduce the ongoing natural carbon uptake by vegetation. As discussed in Section 3.8.1.2, *Greenhouse Gases*, a study of desert vegetation indicates that the desert may uptake carbon in amounts equivalent to 1.48 metric tons of CO_2 per acre per year. As indicated in Section 4.3, *Biological Resources – Vegetation*, the Project would disturb approximately 4,583 acres of vegetation. Based on these assumptions, the maximum carbon uptake expressed as CO_2 that would be eliminated as result of Project-related ground disturbance would be about 6,780 metric tons of CO_2 per year. It should be noted that other studies suggest that Wohlfahrt's (2008) estimate of carbon uptake by desert vegetation such as that found on-site may be too high; therefore, this analysis represents a conservative estimate of the Project's potential effects with regard to the loss of carbon sequestration.

Displacement of GHGs

The proposed renewable source of energy that would be associated with the Project could displace electricity generated by fossil fuel combustion with lower GHG-emitting electricity for consumers. The reduction in GHG emissions by electricity displacement was estimated under the assumption that the solar power would displace electricity generated by dispatchable natural-gas fired combined-cycle power plants and that the Project has a capacity factor of 26 percent. Assuming that the renewable energy produced by the Project would displace gas-fired generation, the Project would displace an estimated 639,061 metric tons CO_2e annually (AECOM, 2012).

Decommissioning

At the end of the 30-year term of the BLM ROW grant, Project operation and maintenance would cease and associated facilities would be decommissioned and dismantled, and the site would be restored over a period of approximately 24 months. Decommissioning activities could generate temporary annual emissions of GHG similar to those that would occur annually during construction of the Project (see above).

Impact Summary

This analysis compares Project emissions, including the total construction and decommissioning GHG emissions amortized over 30 years and added to the operation and maintenance emissions, to the USEPA's GHG mandatory emissions reporting threshold of 25,000 metric tons per year. As shown in Table 4.8-3, the sum of annual operation GHG emissions (including direct and indirect emissions and accounting for the potential reduction in carbon sequestration) and the amortized construction and decommissioning GHG emissions would be up to 8,645 tons (7,843 metric tons) CO_2e per year, which would be below the USEPA's GHG mandatory emissions reporting threshold and therefore is not expected to contribute significantly to climate change through the emission of GHGs.

TABLE 4.8-3
PROPOSED ACTION TOTAL ANNUAL AMORTIZED GHG EMISSIONS

	Annual CO_2e Emissions	
Emission Sources	**tons**	**metric tons**
30-year Amortized Construction Emissions	466	423
Total Direct and Indirect Annual Operation Emissions	239	217
Reduction in Carbon Sequestration During Operation	7,474	6,780
30-year Amortized Decommissioning Emissions	466	423
Amortized Construction + Annual Operation	**8,645**	**7,843**

SOURCES: AECOM, 2012; ESA, 2012.

In addition, assuming that at full build-out the Project would produce approximately 1,708,200 MWh of electricity per year that would displace the generation of electricity from natural gas-fired combined-cycle power plants, the Project would displace an estimated 639,061 metric tons of CO_2e annually, resulting in a net reduction of 631,218 metric tons CO_2e per year.

4.8.3.2 Climate Change Effects on the Project

Climate change is expected to result in a suite of potential changes that could affect the natural environment in a manner that is relevant to the Project. The potential for climate change effects on the Project is discussed below.

Hydrologic Resources

In California and much of the western U.S., climate change is expected to result in several potential effects related to water resources. These include potential sea level rise, potential changes to snowpack and snowmelt periods, changes to the water flow available to dilute wastewater, changes to water temperature, changes in the frequency of flooding and droughts, and potential reductions in surface water supply (DWR, 2008, 2011).

Sea Level Rise

Sea level rise is expected to occur as a result of increased global temperatures (USEPA, 2011c). Increased global temperatures include increases in ocean temperature as well as air temperature. As water temperature increases, the water contained in the world's oceans would undergo thermal expansion. Increased ocean and air temperatures could also result in a net melting/reduction in the extent of polar ice sheets. These effects could result in an increase in the average level of the world's oceans of 7.2 to 23.6 inches (18 to 59 cm) by 210, as estimated by the IPCC (USEPA, 2011c). The IPCC also reports that sea level has risen worldwide approximately 4.8 to 8.8 inches (12 to 22 cm) during the last century (USEPA, 2011d). However, these potential effects are not expected to affect the Project, which would be located approximately 140 miles from the ocean, and at an elevation of at least 450 feet amsl.

Snowpack and Snowmelt Period

Changes in snowpack and the snowmelt period are anticipated in California as a result of climate change (DWR, 2008, 2011). Similar effects are anticipated in the Colorado River system, which includes the PVMBG that exists at the Project site (see Sections 3.20 and 4.20, *Water Resources*, for additional discussion). Specifically, climate change is expected to result in generally warmer temperatures, which in turn would result in a greater proportion of total annual precipitation falling as rain. Snowpack in California and the Colorado River watershed serves as a temporary means of water storage, wherein water is released slowly and into the early summer during snowmelt. If a greater proportion of precipitation falls as rain, the snowpack would be reduced, and the potential for water storage within the snowpack would also be reduced. Also, warmer temperatures would cause earlier snowmelt events, potentially reducing the ability of water managers to capture snow melt in reservoirs. However, there is no snowpack in the vicinity of the Project, and the Project would not be dependent on snowmelt water for water supply because the PVMGB does not receive recharge water from snowmelt.

Dilution

Dilution refers to the amount of water that is available in a receiving water body into which wastewater is discharged. Under some circumstances, climate change could result in a change in the volume or timing of water flows that are available in streams for dilution of wastewater (Kundzewicz et al., 2007). However, because the Project would not discharge wastewater to surface waters (a septic system would be included for on-site wastewater, and process water would be controlled on-site via an evaporation pond system), potential climate-related changes in dilution capacity would not affect the Project.

Water Temperature

Water temperature can be critical to fisheries resources in parts of California, in particular along those waterways that support cold water fisheries. The only perennial waterway in the vicinity of the Project is the Colorado River. Some fish may be present in the agricultural canals and drainages operated by PVID; however, due to the agricultural and intermittent nature of these facilities, they are not generally considered to be quality fish habitat. Because the site eventually drains into the Colorado River, climate-induced increases in air and surface temperature at the site could potentially result in elevated water temperatures in drainage from the site. This could in turn increase water temperatures in the Colorado River. However, such potential for increases in temperature would occur whether or not the Project is implemented, and these changes would not affect Project operation. Additionally, the Project would not draw water from the Colorado River. Therefore, any change in Colorado River temperature that could occur as a result of climate change would not affect the Project.

Flooding, Drainage, and Erosion

Climate change is anticipated to affect the frequency and intensity of extreme weather events, including large storm events and droughts in western watersheds, such as the Colorado River basin where the Project is located (DWR, 2008, 2011; Garfin, 2005). Although the degree of change is a subject of substantial debate, most investigations concur that the Colorado River watershed, including the Project site and its vicinity, would experience an increase in the frequency and intensity of high rainfall and flood events (Christensen et al., 2004; Christensen and Lettenmaier, 2006; Cooley et al, 2009; Mote, 2007). This could result in an increase in potential stormwater runoff and flooding, and an increase in erosion and sedimentation on-site and downstream from the site. Increases in the intensity or frequency of droughts are discussed in terms of water resources availability, below.

As discussed in Section 4.20, Water Resources, the Project would manage stormwater drainage by allowing washes to inundate much of the proposed solar field and associated facilities. Flows would not be re-routed. Also discussed in Section 4.20, the Project would be designed to account for stormwater drainage and flood flows pursuant to Mitigation Measures WATER-2 through WATER-4. These measures would not, however, account for the potential increases in stormwater and flood flows that could result from climate change, which could result in increased erosion, sedimentation, and flooding on-site and downstream. Therefore, implementation of Mitigation Measure CLIMATE-1 would be required to ensure that the application of Mitigation Measures WATER-2 through WATER-4 account for potential increases in flows associated with the indirect effects of climate change.

Water Resources Availability

As discussed in *Water Resources* Sections 3.20 and 4.20, the Project site and immediate vicinity contain only ephemeral drainages and washes. Surface waters in the Project area and its immediate vicinity occur only during substantial precipitation events, when surface runoff occurs. There are no perennial streams or other perennial waterways located on site. While the Colorado River is a perennial river located downstream of the Project, the Project would not rely on surface water for water supply during construction or operation. Instead, the Project would rely on groundwater for water supply during both construction and operation.

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

In the event that climate change results in reduced precipitation within the Project area and its vicinity, some degree of associated reduction in groundwater recharge from rainfall could occur. This situation would not result in increased water requirements by the Project, and would not result in additional groundwater pumping during Project construction or operations. Therefore, even with potential reductions in total precipitation volume associated with future climate change, no increase in pumping would be required as a result of the effects of climate change.

Biological Resources

Biological resources could be affected as a result of climate change in California. Distribution patterns of species are generally expected to shift according to regional changes in temperature and precipitation, while the location of wildlife migration corridors and the extent of invasive species also could be altered (USFWS, 2010, 2011).

Fisheries

The Project would not contain any perennial or other surface waters that contain fisheries resources, and would not affect or be affected by changes in fisheries characteristics.

Habitat Values of Mitigation Lands

As discussed in Sections 4.3, *Biological Resources – Vegetation* and 4.4, *Biological Resources – Wildlife*, implementation of the Project would require mitigation for biological resources values that would be lost as a result of implementation of the Project. The proposed mitigation lands would be required to be equivalent in terms of habitat value and at replacement ratios as specified in Sections 4.3 and 4.4. Climate change could result in adverse effects on biological resources located on these mitigation lands. However, given that mitigation lands must be similar in biological resources value as compared to lost resources on site, it is anticipated that climate-related effects for the mitigation lands would be similar to those located at the Project site, if the Project were not built. Therefore, potential reductions in the biological resources values of mitigation land values resulting from climate change are expected to be similar to on-site conditions in the absence of the Project.

Hazards

Heat-related hazards, including potential increases in wildland fire and heat waves, could be exacerbated by climate change (IPCC, 2007; ISDR, 2008).

Wildland Fire Risks

Potential risks associated with wildland fire are discussed in Section 4.21, *Wildland Fire Ecology*. As described in Section 4.21, during operation and maintenance of the Project, fire protection systems for the solar plant site would include a fire protection water system for protection of the

O&M building, including a maximum of 4 hydrants connected into an up to 1,500 gallon per minute fire line, and portable fire extinguishers. The fire protection water system would be supplied from a 15,000-gallon raw and fire water storage tank located on the solar plant site near the O&M area. In addition, Section 4.21 recommends implementation of Mitigation Measure FIRE-1, which would require the preparation and implementation of a Fire Safety Plan to ensure the safety of workers and the public during Project construction, operation and maintenance, and decommissioning activities.

Climate change generally would result in a small increase in temperature, and also could result in an increase in the frequency of extreme weather events that could generate wildfires, such as increased frequency of drought and heat waves (IPCC, 2007; ISDR, 2008) during operation of the Project. In compliance with applicable regulations and mitigation proposed in Section 4.21, the Applicant would be required to install fire extinguishers and fire-fighting equipment sufficient to extinguish small fires. Although the risk of wildfire that could affect the site could increase as a result of climate change, these potential increases in risk are expected to be offset by ongoing compliance with the worker safety and fire protection regulations and mitigation specified in Section 4.21. Therefore, no additional mitigation is recommended.

Heat Waves

The frequency of occurrence and the severity of heat waves could increase as a result of climate change (IPCC, 2007; ISDR, 2008). Heat waves could result in increased potential risk to Project employees. However, the Project would be required to meet state requirements for worker safety associated with heat stress. No further actions are recommended.

Other Issues

In addition to the issues discussed above, potential climate change-related impacts associated with soil moisture and fugitive dust concentrations also could have effects on the Project site.

Soil Moisture

As discussed in Sections 3.7 and 4.7, *Geology and Soils Resources*, almost all rainfall that occurs in this region of California is lost through evaporation and evapotranspiration. Soil moisture at the Project site is characteristically low. Although precise changes are impossible to predict, climate change could result in increases in extreme weather events, including droughts and heat waves, and an overall reduction in precipitation. These conditions could result in a concurrent reduction in soil moisture content at the site and regionally. However, reductions in soil moisture content would not affect Project-related operations, and would not require any change in water resources usage. Additionally, the proposed facilities would in no way support additional drying of soils on site, or otherwise exacerbate potential changes in soil moisture associated with climate change.

Fugitive Dust

As discussed in Section 4.2, *Air Resources*, the permanent disturbance of desert pavement and resultant fugitive dust emissions would require mitigation during operation of the Project.

Mitigation Measure AQ-2 would mitigate operation period fugitive dust emissions to ensure compliance with state and federal regulations and requirements. Although climate change could result in some degree of reduction of soil moisture, as discussed above, soil moisture is already very low under current conditions. Any further reductions in soil moisture would be inconsequential in terms of the absolute amount of water contained in on-site soils. Therefore, any potential further reductions in soil moisture associated with climate change are not anticipated to result in a substantial increase in fugitive dust emissions, and Mitigation Measure AQ-2 would be sufficient to meet federal and state requirements regarding fugitive dust.

4.8.4 Alternative 2: Reduced Acreage

4.8.4.1 Direct and Indirect GHG Emissions Impacts

Construction

The annual criteria pollutant emissions that would be generated within the MDAB during each calendar year during the 24 months of construction for Alternative 2 have been estimated using the methodologies described in Section 4.8.1, *Methodology for Analysis*. For the purposes of this analysis, it is assumed that construction activities for Alternative 2 would begin in March 2013, and conclude in February 2015. As shown in Table 4.8-4, the annual emissions for 2013 and 2014 would be the same as for the Proposed Action; however, emissions for 2015 would be considerably less under Alternative 2 given that there would only be 2 months of active construction during that year. Annual CO_2e construction emissions under Alternative 2 would vary between 351 metric tons and 3,135 metric tons, and over the 24-month construction period, Alternative 2 would generate a total of 5,801 metric tons CO_2e.

TABLE 4.8-4
ALTERNATIVE 2 CONSTRUCTION EQUIPMENT AND VEHICLE GHG EXHAUST EMISSIONS

Construction Year	Annual CO_2e Emissions (metric tons)		
	Equipment and Vehicle Exhaust	Indirect Electricity and Water Use	Total Emissions
Year 2013	2,307	8	2,315
Year 2014	3,127	8	3,135
Year 2015	350	2	351
Total Project	**5,784**	**18**	**5,801**

NOTE:

* Emissions associated with equipment and vehicle exhaust were estimated by AECOM (2012) and indirect emissions associated with electricity and water use were estimated by ESA (2012).

SOURCES: AECOM, 2012 and ESA, 2012.

Operation and Maintenance

Direct and Indirect Emissions

The annual GHG emissions that would be associated with Alternative 2 would be approximately half of the emissions presented for the Proposed Action. Table 4.8-5 shows the estimated annual GHG emissions that would be directly and indirectly generated each year related to operation and maintenance of Alternative 2 for fossil fuel combustion sources, fugitive SF_6 emissions sources, and indirect emissions related to electricity and water usage. The total estimated annual operation and maintenance emissions that would be associated with Alternative 2 is 109 metric tons CO_2e.

TABLE 4.8-5
ALTERNATIVE 2 ANNUAL GHG EMISSIONS FROM OPERATIONS

Operational sources[a]	Annual CO_2e Emissions (metric tons)
Fossil Fuel Combustion	56
Fugitive SF_6 Emissions	40
Indirect Emissions – Electricity and Water Use	13
Total Annual Operation GHG	**109**

NOTE:

[a] Emissions associated with fossil fuel combustion, fugitive SF_6, and indirect emissions associated with electricity use were estimated based on AECOM (2012) and indirect emissions associated with electricity for water use was estimated based on ESA (2012).

SOURCES: Based on AECOM, 2012; ESA, 2012.

Carbon Sequestration

In addition to direct and indirect emissions of GHGs, Alternative 2 would result in the clearing of land and complete removal of vegetation over an area of approximately 2,266.3 acres. This would reduce the ongoing natural carbon uptake by vegetation. As discussed in Section 3.8.1.2, *Greenhouse Gases*, a study of desert vegetation indicates that the desert may uptake carbon in amounts equivalent to 1.48 metric tons of CO_2 per acre per year. Based on these assumptions, the maximum carbon uptake expressed as CO_2 that would be eliminated as result of ground disturbance under Alternative 2 would be about 3,355 metric tons of CO_2 per year.

Displacement of GHGs

The proposed renewable source of energy that would be associated with the 250 MW solar plant under Alternative 2 could displace electricity generated by fossil fuel combustion with lower GHG-emitting electricity for consumers. The reduction in GHG emissions by electricity displacement was estimated under the assumption that the solar power would displace electricity generated by dispatchable natural-gas fired combined-cycle power plants and that the solar plant would have a capacity factor of 26 percent. Assuming that the renewable energy produced by Alternative 2 would displace gas-fired generation, implementation of Alternative 2 would displace an estimated 213,020 metric tons CO_2e annually (ESA, 2012).

Decommissioning

At the end of the 30-year term of the BLM ROW grant, operation and maintenance of Alternative 2 would cease and associated facilities would be decommissioned and dismantled, and the site would be restored. Decommissioning activities could generate temporary emissions of GHG similar to those that would occur during construction of Alternative 2 (see above).

Impact Summary

For a conservative analysis, this discussion compares emissions under Alternative 2, including the total construction and decommissioning GHG emissions amortized over 30 years and added to the operation and maintenance emissions, to the USEPA's GHG mandatory emissions reporting threshold of 25,000 metric tons per year. As shown in Table 4.8-6, the sum of annual operation GHG emissions (including direct and indirect emissions and accounting for the potential reduction in carbon sequestration) and the amortized construction and decommissioning GHG emissions would be up to 4,244 tons (3,850 metric tons) CO_2e per year, which would be a little less than half of the total annual amortized emissions under the Proposed Action. This emission level would be below the USEPA's GHG mandatory emissions reporting threshold. Therefore, Alternative 2 is not expected to contribute significantly to climate change through the emission of GHGs.

In addition, assuming that at full build-out Alternative 2 would produce approximately 569,400 MWh of electricity per year that would displace the generation of electricity from natural gas-fired combined-cycle power plants, Alternative 2 would displace an estimated 213,020 metric tons of CO_2e annually, resulting in a net reduction of 209,170 metric tons CO_2e per year, which would be approximately one-third of the net reduction that would occur under the Proposed Action. When considering the net GHG emissions that would be associated with Alternative 2, there would be no adverse effects related to the generation of GHG emissions.

TABLE 4.8-6
ALTERNATIVE 2 TOTAL ANNUAL AMORTIZED GHG EMISSIONS

	Annual CO_2e Emissions	
Emission Sources	**tons**	**metric tons**
30-year Amortized Construction Emissions	213	193
Total Direct and Indirect Annual Operation Emissions	120	109
Reduction in Carbon Sequestration During Operation	3,698	3,355
30-year Amortized Decommissioning Emissions	213	193
Amortized Construction + Annual Operation	**4,244**	**3,850**

SOURCES: based on AECOM, 2012; ESA, 2012.

4.8.4.2 Climate Change Effects on Alternative 2

Potential climate change effects on Alternative 2 would be the same as those discussed for the Proposed Action, except that the area affected by Alternative 2 would be reduced. Implementation of Mitigation Measure CLIMATE-1 would be required.

4.8.5 Alternative 3: Reconfigured Gen-tie/Access Road Routes

4.8.5.1 Central Route

Direct and Indirect GHG Emissions Impacts

The Central Route would be a total of approximately 12.5 miles long. This is approximately 86 percent of the length of gen-tie that would be constructed under the Proposed Action. Given the shorter overall length, the Central Route would take approximately 1 month fewer to construct. For purposes of this analysis, it is assumed that construction activities associated with the Proposed Action gen-tie line (i.e., the Eastern Route) would occur during construction Month 6 (August 2013) through Month 13 (March 2014). Therefore, the total annual GHG emissions associated with the Central Route would include one fewer month of transmission line construction work in 2014 compared to the Proposed Action. This would equal approximately 44 fewer metric tons CO_2e for construction year 2014 and approximately 3 fewer amortized metric tons of CO_2e compared to the emissions presented for the Proposed Action (see Tables 4.8-1 and 4.8-3).

Operation and maintenance of the Central Route would be substantially the same as those for the Eastern Route under the Proposed Action.

At the end of the 30-year term of the BLM ROW grant, operation and maintenance of the Central Route would cease and associated facilities would be decommissioned and dismantled, and the ROW would be restored. Decommissioning activities could generate temporary emissions of GHG similar to those that would occur during construction of the Central Route (see above).

The Central Route would disturb approximately 70 acres of vegetation, and the maximum carbon uptake expressed as CO_2 that would be eliminated as result of this disturbance would be 104 metric tons per year, compared to 204 metric tons per year for the Eastern Route proposed as part of Alternative 1.

In summary, the total amortized annual CO_2e emissions under the Central Route would be lower by 106 metric tons per year, including amortized construction and decommissioning emissions, and would not cause the Project to exceed USEPA's GHG mandatory emissions reporting threshold when combined with either the Alternative 1 or Alternative 2 solar plant site.

Climate Change Effects on the Central Route

Potential climate change effects on the Central Route would be substantially the same as those discussed for the Proposed Action. Implementation of Mitigation Measure CLIMATE-1 would be required.

4.8.5.2 Western Route

Direct and Indirect GHG Emissions Impacts

The Western Route would be a total of approximately 15.5 miles long. This is approximately 10 percent longer than what would be constructed under the Proposed Action. Given the longer overall length, the Western Route would take approximately 1 month more to construct. For the purposes of this analysis, it is assumed that construction activities associated with the proposed Eastern Route would occur during construction Month 6 (August 2013) through Month 13 (March 2014). Therefore, the total annual GHG emissions associated with the Western Route would include one additional month of transmission line construction work in 2014 compared to the Proposed Action. This would equal approximately 44 additional metric tons CO_2e for construction year 2014 and approximately 3 additional amortized metric tons of CO_2e compared to the emissions presented for the Proposed Action (see Tables 4.8-1 and 4.8-3).

Operation and maintenance of the Western Route would be substantially the same as those for the Eastern Route under the Proposed Action.

At the end of the 30-year term of the BLM ROW grant, operation and maintenance of the Western Route would cease and associated facilities would be decommissioned and dismantled, and the ROW would be restored. Decommissioning activities could generate temporary emissions of GHG similar to those that would occur during construction of the Western Route (see above).

The Western Route would disturb approximately 183 acres of vegetation, and the maximum carbon uptake expressed as CO_2 that would be eliminated as result of this disturbance would be 271 metric tons, compared to 204 metric tons for the Eastern Route proposed as part of Alternative 1.

In summary, total emissions of CO_2e under the Western Route would be greater by 73 metric tons per year, including amortized construction and decommissioning emissions, but would not cause the Project to exceed USEPA's GHG mandatory emissions reporting threshold when combined with either the Alternative 1 or Alternative 2 solar plant site.

Climate Change Effects on the Western Route

Potential climate change effects on the Western Route would be substantially the same as those discussed for the Proposed Action. Implementation of Mitigation Measure CLIMATE-1 would be required.

4.8.6 Alternative 4: No Action Alternative

4.8.6.1 Direct and Indirect GHG Emissions Impacts

Under Alternative 4, none of the GHG emissions-related impacts of the Proposed Action would occur. Therefore, the No Action Alternative would have no impact with respect to GHG emissions. However, Alternative 4 would not displace the generation of GHG emissions from existing natural gas-fired combined-cycle power plants and would result in the continued long-term adverse impact associated with annual GHG emissions compared to implementation of the Proposed Action.

4.8.6.2 Climate Change Effects on Alternative 4

The potential indirect effects of climate change on surrounding areas would still occur under Alternative 4 because such climate change effects are anticipated regardless of whether a solar energy project is implemented. However, under Alternative 4 there would be no MSEP-specific facilities to affect because no such facilities would be constructed or operated.

4.8.7 Cumulative Impacts

4.8.7.1 GHG Emissions

GHG emissions are inherently a cumulative concern because it is the accumulation of global GHG emissions in the atmosphere that results in global climate change; therefore, the geographic scope of cumulative impacts related to GHG emissions and climate change is global. The Project would result in short-term GHG emissions during construction and decommissioning, limited long-term GHG emissions during operations and maintenance, and would result in a long-term reduction of carbon sequestration at the site. However, the Project could result in a long-term net reduction of approximately 631,218 metric tons of CO_2e per year by displacing electricity from fossil fuel-fired power plants, and therefore would not conflict with the state's GHG reduction goals. Virtually all of the cumulative projects described in Section 4.1.5, *Cumulative Scenario Approach*, could contribute to global warming due to the generation of short-term and/or long-term GHG emissions. However, similar to the Project, the renewable energy cumulative projects could result in long-term decreases in GHG emissions by displacing electricity from fossil fuel-fired power plants.

4.8.7.2 Climate Change Impact on the Project

Climate change, which itself is a cumulative impact associated with the global increase of GHG emissions, is expected to result in a suite of potential changes that could affect the natural environment in a manner that is relevant to the Project. The climate change impacts on the Project described in Section 4.8.3.2 would be the result of cumulative contributions to global GHG emissions over a time horizon of approximately the 30-year term of the BLM ROW grant.

4.8.8 Mitigation Measures

GHG-1: All SF_6-containing circuit breakers that will be installed for each power unit shall be hermetically sealed.

CLIMATE-1: In order to ensure that on site facilities are protected from increased intensity stormwater flows and flood flows that could occur as a result of climate change, the application of Mitigation Measures WATER-2, WATER-3, and WATER-4 shall account for potential increases in flows associated with the indirect effects of climate change. Specifically, the proposed mitigation measures shall require implemented design features and management practices that account for a climate-related increase in potential maximum flow volumes of at least 20 percent. All flood control and stormwater management facilities shall be designed accordingly.

4.8.9 Residual Impacts after Mitigation Incorporated

There would still be GHG emissions after mitigation has been incorporated; however, they would not be a substantial contribution to climate change.

4.9 Hazards and Hazardous Materials

4.9.1 Methodology for Analysis

This analysis of potential impacts of the Proposed Action and Alternatives related to Hazards and Hazardous Materials focuses on possible impacts to the health and safety of the public. Impacts are identified and evaluated based on relevant BLM standards, policies, and guidelines. Studies and other information provided by the Applicant also were reviewed, including the following:

1. Tetra Tech EC, Inc., 2011. *Phase I Environmental Site Assessment*, *McCoy Solar Energy Project, Riverside County, CA* (January, 2011).

2. Information regarding hazardous materials use and health and safety practices for the Proposed Action.

4.9.1.1 Risk of Accidents and Spills

This analysis reviews and assesses the potential for the transportation, storage, and use of hazardous materials to affect the surrounding community. It is recognized that some hazardous materials must be used for Project construction and operation; all chemicals identified in connection with the MSEP are evaluated. In order to assess the potential for a release of hazardous materials to affect the public or the environment, this analysis examines the type and quantity of hazardous materials to be used, the manner in which the Applicant would handle, store, and dispose of hazardous materials and hazardous wastes, and the transportation of hazardous materials to and from the facility.

Engineering and administrative controls concerning hazardous materials use are included as part of the Proposed Action and Alternatives. Engineering controls are the physical or mechanical systems that can prevent the spill of hazardous material from occurring, or that can either limit the amount of a spill or to a confined area. Examples of engineering controls are storage tanks and secondary containment basins. Administrative controls are the rules and procedures that workers at the facility must follow that would help to prevent accidents or to minimize releases if they do occur. These procedures typically are established in worker safety training and emergency response plans. Both engineering and administrative controls can act as methods of prevention or as methods of response and minimization. In both cases, the goal is to prevent a spill from moving off-site and from causing harm to the public or the environment.

This analysis reviews and evaluates the Applicant's proposed use of hazardous materials as described by the Applicant. In conducting this analysis, these three steps were followed:

Step 1: Review the types and quantities of hazardous materials proposed for on-site use as listed in the Plan of Development and other information provided by the Applicant.

Step 2: Review and evaluate the engineering and administrative controls proposed by the Applicant to prevent spills and respond to accidents.

Step 3: Analyze the theoretical impacts on the public of a greatest-consequence spill of hazardous materials, as reduced by the engineering and administrative controls proposed by the Applicant. When such controls would be sufficient, no further mitigation is recommended. If additional mitigation measures would further reduce or avoid impacts of the Proposed Action or an Alternative, additional prevention and response controls are proposed.

4.9.1.2 Emergency Response

This analysis assesses potential impacts to public safety that could result if the Proposed Action or an Alternative impaired implementation of an emergency response or evacuation plan. This assessment first determines whether local emergency response or evacuation plans have been adopted and then whether the Proposed Action or an Alternative would impede emergency evacuation routes or emergency response actions.

4.9.1.3 Aircraft Operations

Research on the presence of public and private airports within the vicinity of the Project, FAA regulations, and review of the Riverside County ALUCP for the Blythe Airport was conducted to evaluate whether the Proposed Action or an Alternative would adversely affect commercial, military, or personal air navigation safety.

4.9.1.4 Intentionally Destructive Acts

Intentionally destructive acts could include, for example, malicious mischief, vandalism, or domestic or foreign terrorist attacks. This analysis of impacts related to intentionally destructive acts is based on the screening criteria for vulnerability assessments of chemical facilities and electric power infrastructure and assesses the following questions: Is the Project a critical electric infrastructure facility? Does the facility use any of the chemicals on the list of regulated substances in 40 CFR §68.130? What would be the estimated severity of impact from a release of hazardous materials from the site or from power disruption?

4.9.1.5 Abandoned Mined Lands

As discussed in Section 3.9.1.6, there are no abandoned mined lands identified on the MSEP or alternative sites. Therefore, the Proposed Action and alternatives would result in no impacts related to abandoned mined lands.

4.9.2 Applicant Proposed Measures

There are no APMs to address potential effects from hazards and hazardous materials.

4.9.3 Alternative 1: Proposed Action

4.9.3.1 Direct and Indirect Impacts

Aircraft Operations

Approximately 7.9 miles of the proposed gen-tie line would be located within the Blythe Airport Influence Area in Airport Compatibility Zones C, D, and E, with about 1,500 feet in Zone C. Because gen-tie line support poles would be spaced 800 feet apart, approximately 52 poles with heights from 70 to 145 feet would be located within these airport zones. For structures on private land, ALUC review of projects for consistency with the ALUCP is required for all structures greater than 70 feet in Zone C, and 150 feet in Zones D or E.

Because the transmission line and poles could affect navigable airspace, the FAA requires the Applicant to file Forms 7460-1, Notice of Proposed Construction or Alteration, and 7460-2, Notice of Actual Construction or Alteration (USDOT, 2007). Following the Applicant's submittal of Form 7460-1 for the FAA's safety assessment at least 45 days prior to the start date of construction, the FAA would conduct a safety analysis to determine the effect of the proposed towers and transmission line on aircraft operations. The Project must receive a "Determination of No Hazard to Air Navigation" in order to proceed.

The FAA conducted a similar safety analysis for the neighboring BSPP which would have 52 poles ranging in height from 90 feet to 145 feet, including 43 poles within the airport compatibility area. The FAA concluded that the proposed BSPP transmission line would not pose a hazard to air navigation. With pole heights of 70 to 145 feet, it is anticipated that the MSEP similarly would receive a "No Hazard" determination. This would be required prior to construction of the Proposed Action.

Construction

Construction of a portion of the proposed gen-tie line would occur within the Blythe Airport Compatibility Zones C, D, and E. Construction would include the use of cranes to install approximately 52 gen-tie support poles up to 145 feet in height and 7.9 miles of transmission line within the Blythe Airport Influence area. During pole installation, the total height of the cranes would extend higher than the proposed towers. In such a situation, a separate notice to the FAA is required. The FAA would consider the proposed construction method, including use of cranes, in its safety assessment. With receipt of an FAA "Determination of No Hazards to Air Navigation," construction of the Project would not have an adverse effect on aircraft operations.

Operation and Maintenance

Within 5 days of completing construction within the Airport Compatibility Area, the Applicant would be required to submit Form 7460-2 notifying the FAA of completion of construction. With prior receipt of a "No Hazard" determination, MSEP operation and maintenance would not have an adverse effect on aircraft operations.

Decommissioning

Decommissioning activities would be similar to construction activities, and would be considered as part of the safety assessment performed by the FAA. The Applicant would be required to submit Forms 7460-1 and 7460-2 to notify the FAA of any proposed alterations to the gen-tie line and support poles. With receipt of a “No Hazard” determination, decommissioning would not have an adverse effect on aircraft operations.

Environmental Site Contamination

Ground-disturbing activities would disturb on-site soils that may contain materials such as metals and perchlorates which, if inhaled, could result in adverse health effects for workers. Although some fugitive dust would result from operation and maintenance as described in Section 4.2, *Air Resources*, the primary concern if such materials are present on site would be construction workers potentially exposed to more dust. Because construction would be temporary, long-term exposures are not anticipated to occur. Implementation of dust suppression measures in APMs AIR-1 and AIR-2 would reduce the potential for worker exposure to any hazardous materials that may be present in site soils by reducing the amount of dust released from construction and operation activities. In addition, as described in Section 2.3.1.4.12, *Health and Safety,* construction-related safety programs and procedures would include a PPE program and respiratory protection program that would further reduce the potential for exposure to any existing on-site hazardous materials. Finally, implementation of Mitigation Measure HAZ-1, which requires the Applicant to prepare and implement a site-specific Hazardous Materials Safety Plan, would minimize potential exposures to existing hazardous materials if such materials are found to be present on site.

Risk of Accidents and Spills

Construction

Hazardous materials proposed for use during construction activities include gasoline, diesel fuel, oil, lubricants, and small quantities of solvents and paint. As explained Section 2.3.1.4.10, *Waste and Hazardous Materials Management*, hazardous wastes generated by the Project would include an estimated 1 cubic yard per week of empty hazardous materials containers and approximately 175 gallons of used oil, spent solvents, and oily rags every 3 months. Fuel tanks and hazardous materials would be stored at staging areas, and wastes, such as empty hazardous materials containers and used oil, spent solvents, and oily rags, would also be accumulated prior to disposal. The use, storage, and disposal of hazardous materials and wastes associated with the Proposed Action could result in potential adverse health and environmental impacts if these materials were used, stored, or disposed of improperly, causing accidents and spills. Potential direct and indirect impacts of such releases could degrade soil and water quality or expose humans and wildlife to the harmful effects of hazardous materials.

As required, the Applicant would store all hazardous materials in the manner specified by the manufacturer and in accordance with local, state, and federal regulations. The construction SWPPP proposed by the Applicant and required by law would describe methods to reduce the potential for spills and establish procedures to minimize the effect of accidental releases. Best management practices (BMPs) established in the SWPPP would include protection measures for the temporary on-site storage of diesel fuels, hydraulic fluid, lubricants, and other hazardous materials used during construction, including requirements for secondary containment and berming to contain a potential release and to prevent any such release from reaching a nearby waterway. All employees would receive training in the proper use, storage, and handling of hazardous materials; equipment and materials storage would be routinely inspected for leaks and records maintained documenting compliance with regulations for the storage and handling of hazardous materials, as required by the SWPPP. Further, the Applicant would be required to prepare a SPMP that outlines the discharge prevention measures, spill containment systems, and procedures to be followed to contain and clean up potential releases from above-ground storage tanks.

The Applicant also would prepare an Emergency Action Plan (EAP) that would designate responsibilities and actions to be taken in the event of a fire or other emergency during construction. The EAP, including fire prevention and suppression, and a worker safety plan would be provided to BLM, the County, and local fire departments for approval before the Applicant receives an NTP. In addition, as described in Section 2.3.1.4.12, *Health and Safety,* construction-related safety programs and procedures would include a hearing conservation program, respiratory protection program, fall protection procedures, hot work procedures, cranes and rigging/lifting requirements, heavy equipment procedures, and others.

During construction activities for the Project, the potential exists that undocumented subsurface utilities (e.g., a natural gas line) or structures (e.g., an UST) might be encountered and damaged, resulting in a release of a hazardous material. The potential for such incidents would be reduced by thoroughly screening for subsurface structures in areas prior to commencement of any subsurface work. Screening activities would include use of DigAlert (Underground Services Alert of Southern California), visual observations, hand digging, and use of buried line locating equipment.

Compliance with existing regulations would reduce but would not completely avoid hazards to construction workers, the public, and the environment.

Operation and Maintenance

Project operation and maintenance would require the routine transport, use, and disposal of hazardous materials and hazardous wastes such as diesel fuel, hydraulic fluid, water treatment chemicals, oily rags, spent batteries. Storage of hazardous materials, described in Chapter 2, *Proposed Action and Alternatives*, would include an above-ground 3,600-gallon diesel tank, hydraulic fluid in tracker drives and drums, 500 gallons of mineral oil within each transformer, and various gases. Hazardous wastes are estimated to include approximately 1,000 gallons per year of used hydraulic fluid and oil, and one 55-gallon drum per month of oily rags and absorbent material. Limited pesticide use to control noxious weeds would occur in accordance to an Invasive Weed Management Plan following approval from the BLM. If hazardous materials or wastes were improperly handled, a release could occur that could affect public health or the environment.

Numerous federal, state, and local regulations ensure the safe transportation, use, storage, and disposal of hazardous materials. The Applicant must prepare a HMBP that describes the hazardous materials handled and demonstrates facility compliance with applicable handling, storage and disposal regulations. The HMBP must be reviewed and approved by the local CUPA, the Riverside County Department of Environmental Health, which would be responsible for facility inspections. In addition, the SPMP measures would minimize the potential for releases from storage tanks and containers to affect the environment. Pesticide use, if needed, would be limited to non-persistent, immobile pesticides applied only in accordance with manufacturer directions and all regulations for pesticide use. Any pesticide applications would be conducted within the framework of BLM and Department of Interior policies.

The Applicant's EAP would designate responsibilities and actions to be taken in the event of a fire or other emergency during operation and maintenance. The EAP, including fire prevention and suppression, and a worker safety plan would be provided to BLM and local fire departments for approval before the Applicant receives an NTP. As described in Section 2.3.1.4.12, the Applicant's Safety and Health Program would document worker safety practices. In addition to the EAP, the program would include a PPE Program and an IIPP to address health and safety issues associated with normal and unusual (emergency) conditions associated with the high voltage systems, mechanical systems, and other solar plant operations. Personnel would be properly trained in the handling of relevant chemicals and wastes and instructed in the procedures to follow in case of a chemical spill or accidental release.

Routine transportation of hazardous materials to the site could create a hazard to the public or the environment if materials were improperly handled, or indirectly could result in an incremental increase in the potential for accidents; however, Caltrans and the California Highway Patrol regulate the transportation of hazardous materials and wastes, with stringent packaging requirements, licensing and training for hazardous materials truck operators, chemical handlers, and hazardous waste haulers.

The Applicant is considering use of PV panels that contain a thin semiconductor layer containing cadmium telluride (CdTe). While CdTe itself is a hazardous substance in an isolated form, the CdTe in the PV panels is bound and sealed within the glass sheets and a laminate material (Fthenakis, 2003, 2008). A report by the Norwegian Geotechnical Institute (NGI) notes that "If the modules are destroyed during use and are exposed to rain, emissions can occur; however, a very low vapour pressure and water solubility are expected to result in only trace emissions into the environment" (NGI, 2010, p. 13). Additionally, an article that examined the potential for CdTe leaching from commercial rooftop solar PV installations found the worst-case modeled environmental concentrations in soil, air, and groundwater in a California-based scenario, are one to five orders of magnitude below human health screening levels (Sinha et al., 2012). If the Applicant chooses to use CdTe PV panels, implementation of Mitigation Measure HAZ-2, which requires the Applicant to prepare and implement a Broken PV Module Detection and Handling Plan, would minimize the potential for CdTe leaching from damaged panels.

Compliance with existing laws and regulations would reduce but not completely avoid potential impacts related to the routine use, storage, transportation, and disposal of hazardous materials.

Decommissioning

Project decommissioning would require the use of fuel and lubricants for construction vehicles and equipment, as well as the transport and disposal of hazardous materials used at the facility. PV panels would be returned to the vendor for appropriate recycling. Inadvertent release of hazardous materials from spills or leaks could occur. As discussed above, compliance with existing laws and regulations would reduce but not completely avoid potential impacts related to the routine use, storage, transportation, and disposal of hazardous materials.

Emergency Response

Construction

Project construction would occur primarily in undeveloped areas, accessed by secondary roads. The Riverside County Operational Area Emergency Operations Plan (RCFD, 2006) does not designate emergency evacuation routes; therefore, Project construction would not impair implementation of, or physically interfere with, an adopted emergency response or evacuation plan. Local roads are unlikely to be used as emergency routes because of the remote location of the Project site. The main access road to the solar plant would be designed to meet the RCFD requirements.

As discussed above, the Applicant would coordinate with local fire departments and emergency responders during preparation of an EAP that would outline emergency evacuation and response procedures.

Operation and Maintenance

Operation and maintenance of the Project would neither cause any road closures nor impair access to local roads. The main access road to the solar plant would be designed to meet the Riverside County Fire Department requirements. Both the main entrance gate and the secondary emergency access gate would be equipped with a Fire Department Knox Box or other access device and emergency contact placards.

As discussed above, the Applicant would coordinate with local fire departments and emergency responders during preparation of an EAP that would outline emergency evacuation and response procedures. The potential for adverse impacts related to emergency response would be low.

Decommissioning

Project decommissioning activities would be similar to construction activities, and so also would not impair implementation of or physically interfere with an adopted emergency response plan.

Public Health

Construction

As described in Section 3.9.1.4, incidence of WNV in Riverside County, and therefore the risk to public health from this vector-borne disease, is extremely low. Implementation of Mitigation Measure WATER-3, which requires a comprehensive drainage, stormwater, and sedimentation control plan, would reduce the potential for unintentional ponding of water on-site or downstream of the Project. This would reduce the risk of mosquito breeding on or near the site, and therefore would reduce the risk for workers and the public of contracting vector-borne diseases.

Additionally, as described in Section 3.9.1.4, incidence of Valley Fever in Riverside County is also low. However, fugitive dust generated during Project construction could expose workers to Coccidioides fungal spores that may be present in desert soils. Implementation of APM AIR-1 and Mitigation Measure AQ-1 would reduce fugitive dust during the construction phase, which would reduce the risk to workers of contracting Valley Fever.

Operation and Maintenance

Similar to construction, implementation of Mitigation Measure WATER-3 during operation and maintenance would reduce risk of vector-borne diseases. Implementation of APM AIR-2 and Mitigation Measure AQ-1 would reduce fugitive dust, which would reduce the risk of Valley Fever infections.

Decommissioning

Similar to construction, implementation of Mitigation Measure WATER-3 during decommissioning would reduce risk of vector-borne diseases. Implementation of APM AIR-1 and Mitigation Measure AQ-1 during decommissioning would reduce fugitive dust, which would reduce the risk of Valley Fever infections.

Intentionally Destructive Acts

Construction

The risk to workers or to the public from intentionally destructive acts during construction would be low, as public access to the proposed construction and staging areas would be controlled by security and fencing.

Operation and Maintenance

None of the chemicals proposed for use or storage at the solar plant site are on the list of regulated substances in 40 CFR §68.130; thus, the MSEP facility would not be covered by the security standards for chemical facilities. The consequences of release of all the hazardous materials used at the facility (diesel fuel, mineral oil, and hydraulic fluid) would not cause a threat to the health and safety of the surrounding community due to the limited quantity and toxicity of the substances and the distance to the nearest receptors. Nonetheless, the BLM encourages energy project applicants to implement at least a minimum level of security consistent with the standards to protect California’s electrical infrastructure from intentionally destructive acts.

The level of security needed for a particular power plant depends on the threat imposed, the likelihood of an adversarial attack, the likelihood of success in causing a catastrophic event, and the severity of consequences of that event. To determine an appropriate level of security for the adjacent BSPP, the CEQA and NEPA lead agencies for that project used an internal vulnerability assessment decision matrix modeled after the U.S. Department of Justice Chemical Vulnerability Assessment Methodology, NERC guidelines, and U.S. Department of Homeland Security regulations to determine that the Project would fall into the “low vulnerability” category.

Given the similarities in location and the general type of proposed development relative to the BSPP, and the MSEP-specific security measures proposed by the Applicant, the BLM has determined that the MSEP also would fall into the “low vulnerability” category. The Applicant’s security measures would minimize the potential for power disruptions or hazardous materials release caused by outside parties. The risk to workers or the public from damage to the MSEP as a result of intentionally destructive acts would be low because public access would be controlled by security and fencing. Security fencing would be installed around the solar plant site perimeter, substations, and around the evaporation pond. The security fencing would be 8 feet tall, with 3-strand barbed wire. Once the Project is constructed, non-emergency access would be limited to the main gate and would require an electronic swipe card or other tracking mechanism to prevent unaccompanied or unauthorized access to the facility. All MSEP personnel, contractors, and visitors would be logged into and out of the facility during normal business hours. Visitors and contractors would be allowed entry only with approval from a staff member at the facility.

Decommissioning

The risk to workers or to the public from intentional acts during decommissioning would be low because public access to construction and staging areas would be controlled by security and fencing.

4.9.4 Alternative 2: Reduced Acreage

Construction

Alternative 2 would cause the same types of hazard and hazardous materials-related impacts as the Proposed Action. However, because the solar plant site would be smaller for Alternative 2 than for the Proposed Action, Alternative 2 would involve a smaller geographic area and shorter construction and decommissioning periods than the Proposed Action. Consequently, the hazards and hazardous materials-related impacts associated with the construction of Alternative 2 would be reduced relative to the Proposed Action. With implementation of Mitigation Measures HAZ-1 and HAZ-2, the potential risks to workers from encountering hazardous materials, and to the environment from potential leaching of CdTe from damaged panels, would be reduced but not completely avoided.

Operation and Maintenance

Alternative 2 would cause the same types of hazard and hazardous materials-related impacts over the same time period as the Proposed Action. However, the geographic area within which

Alternative 2 would be developed would be smaller than for the Proposed Action, and so limit the area within which hazards to the public, workers, and the environment could result. Consequently, the hazards and hazardous materials-related impacts associated with the operation and maintenance of Alternative 2 would be reduced relative to the Proposed Action. With implementation of Mitigation Measures HAZ-1 and HAZ-2, the potential risks to workers from encountering hazardous materials, and to the environment from potential leaching of CdTe from damaged panels, would be reduced but not completely avoided.

Decommissioning

Alternative 2 would cause the same types of decommissioning-related hazards and hazardous materials impacts as decommissioning the Proposed Action; however, Alternative 2's smaller footprint would constrain the area within which accidents or upsets could occur and thereby release hazardous materials. Consequently, the hazards and hazardous materials-related impacts associated with decommissioning Alternative 2 would be reduced relative to the Proposed Action.

4.9.5 Alternative 3: Reconfigured Gen-tie/Access Road Routes

4.9.5.1 Central Route

Direct and Indirect Impacts

The Central Route would cause the same types of construction and decommissioning-related hazards and hazardous materials impacts as the Proposed Action, although the location of the impacts associated with the proposed gen-tie route would be shifted to the west relative to the Proposed Action. The Central Route would be shorter than for the Proposed Action, resulting in a slightly shorter duration for construction and decommissioning and, thereby, a slightly reduced potential for accidents or upsets to occur. Consequently, the hazards and hazardous materials-related impacts associated with constructing and decommissioning the Central Route would be slightly reduced relative to the Proposed Action. With implementation of Mitigation Measures HAZ-1 and HAZ-2, the potential risks to workers from encountering hazardous materials would be reduced but not completely avoided.

The Central Route would cause the same operation and maintenance-related hazards and hazardous materials impacts as the Proposed Action. The length of the Central Route within the Blythe Airport Influence Area would be 5.86 miles, which is slightly shorter than the proposed gen-tie and access road route; however, there would be no substantial difference between this Alternative and the Proposed Action because the Applicant would need to obtain an FAA Determination of No Hazard prior to construction regardless of which Alternative were selected.

4.9.5.2 Western Route

Direct and Indirect Impacts

The Western Route would cause the same types of construction and decommissioning-related hazards and hazardous materials impacts as the Proposed Action, although the location of the impacts associated with the proposed gen-tie route would be shifted to the west relative to the Proposed Action. The Western Route would be longer than for the Proposed Action, resulting in a slightly longer duration for construction and decommissioning and, thereby, a slightly increased potential for accidents or upsets to occur. Consequently, the hazards and hazardous materials-related impacts associated with constructing and decommissioning the Western Route would be slightly increased relative to the Proposed Action. With implementation of Mitigation Measures HAZ-1 and HAZ-2, the potential risks to workers from encountering hazardous materials would be reduced but not completely avoided.

The Western Route would cause the same operation and maintenance-related hazards and hazardous materials impacts as the Proposed Action. The length of the Western Route within the Blythe Airport Influence Area would be 5.38 miles, which is slightly shorter than the proposed gen-tie and access road route; however, there would be no substantial difference between this Alternative and the Proposed Action because the Applicant would need to obtain an FAA Determination of No Hazard prior to construction regardless of which Alternative were selected.

4.9.6 Alternative 4: No Action Alternative

If Alternative 4 were implemented, Project-specific changes would be implemented on the site and the existing environmental setting described in Chapter 3 would be maintained. As a no-development alternative, the No Action Alternative would result in no changes to conditions related to hazards and hazardous materials.

4.9.7 Cumulative Impacts

Depending on the pathway of exposure, the geographic scope for cumulative effects relating to hazardous materials would be the air basin, watershed boundary, groundwater basin, or extent of affected soils. Materials delivery routes also would be included in the event of a traffic accident-related spill. The geographic scope for cumulative effects related to aviation safety is the Blythe Airport Influence Area. The temporal scope of hazardous materials impacts would occur throughout the life of the Project. For aviation safety impacts, this time period likely could extend past site closure and decommissioning of the MSEP because the transmission lines could accommodate power from other nearby electricity generation projects.

Many of the cumulative projects along the I-10 corridor identified in Tables 4.1-3 and 4.1-4 could cause similar impacts related to the potential for release of hazardous materials during routine use, transport, storage, and disposal for construction and operation of these projects.

Construction, operation, maintenance, and decommissioning of the Project would result in impacts related to the potential to encounter hazardous materials, or for accidents during the routine use of hazardous materials, to release hazardous materials into the environment or cause harmful exposures. With implementation of Mitigation Measures HAZ-1 and HAZ-2, the potential risks to workers from encountering hazardous materials, and to the environment from potential leaching of CdTe from damaged panels, would be reduced but not completely avoided.

Impacts caused by the cumulative projects, combined with the Project, would not result in an adverse cumulative hazards or hazardous materials impact even if all of the projects were to be constructed simultaneously. The Project and all cumulative projects would be required to adhere to the robust body of regulations that govern hazardous materials transport, storage, and handling, water quality BMPs, and worker safety and because these laws and other requirements have been adopted with cumulative safety considerations in mind and to be sufficiently protective of human health and safety under cumulative conditions. Compliance with these measures would ensure that impacts related to exposure to hazardous materials would be minimized and/or avoided.

With respect to aviation safety, the incremental impacts of construction, operation, maintenance, and decommissioning of the MSEP could contribute to a cumulative effect on aviation safety when considered in combination with additional transmission lines and support poles that would be associated with the cumulative projects that are or may be located within the Blythe Airport Influence Area: the existing DPV1 Transmission Line and Blythe Energy Project Transmission Line, and future or proposed DPV2 Transmission Line Project, Desert Southwest Transmission Line, and gen-tie lines for the BSPP, enXco McCoy, Blythe Airport Solar I, Gypsum Solar, and Palo Verde Mesa Solar projects. Each of these projects would be subject to the same required FAA aviation safety assessment as the MSEP. The FAA "Determination of No Hazard to Air Navigation" must address the "Cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures" (USDOT, 2012). The issuance of this determination would signify that no adverse cumulative impact would result from the Project in combination with other projects within the Blythe Airport Compatibility Area. Additionally, the Riverside County ALUC evaluates any proposals for power lines, especially if the power lines would be located wholly or partially in Zones B1 or C, and/or if the power lines would intersect the straight-line extension of a runway.

The development and operation of the MSEP would contribute an incremental "low vulnerability" determination with respect to intentionally destructive acts that could combine with the individual threat levels of other past, present, or reasonably foreseeable future energy generation projects. The geographic scope of the cumulative impacts analysis for such threat would be the California Desert area. Potential cumulative effects could occur at any time during the lifespan of the MSEP, but would not persist past closure and decommissioning.

Other past, present, and reasonably foreseeable renewable energy generation projects are identified in Tables 4.1-3 and 4.1-4 and include similar utility-scale solar proposals and projects such as BSPP, Genesis, Palen, and Desert Sunlight. These facilities also have been determined to have a low threat level. The human and environmental consequences of a realized threat of an intentionally destructive act could be comparable regardless of an energy generation facility's size or power output; however, although possible, it seems unlikely that the targeting of renewable energy facilities along the I-10 corridor would result in a catastrophic event. Intentionally destructive acts are by their nature unpredictable, and it would be speculative to conclude that the MSEP would cause or contribute to a significant cumulative effect in this regard.

The RCFD has indicated that the Project would contribute to an adverse cumulative impact on its ability to provide an acceptable level of service at the Project site as a result of the development of the numerous renewable energy projects existing, approved, and proposed in eastern Riverside County. This cumulative impact would result from an increased number of calls for emergency and other public services due to the increased presence of structures, traffic, hazardous materials, and service vehicles. A response to an emergency at the Project site by the RCFD would require multiple units to respond. In the event of a fire, medical emergency, hazardous material or technical rescue incident, the RCFD would then be required to cover or back fill stations left uncovered in order to meet the service demands of the region. If an incident were to occur, fire units would be dispatched from Blythe, Indio, and the lower Coachella Valley as part of the regional integrated fire protection response system, and the Project site would experience extended response times from specialized equipment.

4.9.8 Mitigation Measures

HAZ-1: Site-specific Hazardous Materials Safety Plan. The Applicant shall prepare and implement a site-specific Hazardous Materials Safety Plan. The plan shall identify the chemicals potentially present in on-site soils, health and safety hazards associated with those chemicals, monitoring to be performed during site activities, soil handling and disposal methods required to minimize the potential for harmful exposures, appropriate personal protective equipment, and emergency response procedures. The Plan shall be included in and implemented as part of the Project's larger Safety and Health Program. The plan shall be submitted to the BLM for approval prior to commencement of construction activities and shall be distributed to all construction crew members prior to construction and operation of the Project.

HAZ-2: Broken PV Module Detection and Handling Plan. If photovoltaic (PV) panels containing cadmium telluride (CdTe) are used on the Project site, the Applicant shall prepare and implement a Broken PV Module Detection and Handling Plan. The plan shall describe the Applicant's plan for identifying and handling photovoltaic (PV) modules that may break, chip, or crack at some point during the Project's life cycle. The plan shall describe and define methods for detecting and handling broken PV modules to ensure the safe handling, storage, transport, and recycling and/or disposal of the modules and related electrical components in a manner that is compliant with applicable law and protective of human health and the environment. The plan shall be submitted to the BLM for approval prior to commencement of construction activities and shall be distributed to all construction crew members and temporary and permanent employees prior to construction and operation of the Project.

4.9.9 Residual Impacts after Mitigation Incorporated

Following implementation of Mitigation Measures HAZ-1 and HAZ-2, potential impacts related to hazards and hazardous materials would be avoided or substantially reduced.

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4.10 Lands and Realty

4.10.1 Methodology for Analysis

Evaluation of potential land use impacts of the Proposed Action and Alternatives is based on review of the BLM Master Title Plats and Land & Mineral Legacy Rehost 2000 System (LR2000), which is an automated record system, to obtain information related to pending and authorized uses on the lands potentially affected by the Project and its ancillary facilities. The BLM Washington Office and California State Office web sites provided additional information relating to corridor designations and solar study areas potentially affected by the Proposed Action.

Impact assessment is based on known impacts relative to construction, operation, maintenance, and decommissioning of rights-of-way and land use permits of all types on BLM-administered land. Potential land use conflicts are identified and evaluated based on existing land uses, land uses proposed as part of the Proposed Action and Alternatives, federal land use designations established in the CDCA Plan, and BLM land use-related standards and policies. Land use compatibility is based on the intensity and patterns of land use to determine whether the Project would result in incompatible uses or nuisances. Potential land use conflicts (specifically during construction and decommissioning) usually result from other environmental effects, such as generation of noise, dust, or heavy truck traffic associated with materials delivery. Potential operation and maintenance-related land use impacts of the Project are evaluated in this section.

The analysis of potential impacts to MUCs is based on review of the MUC Guidelines provided in Table 1 of the CDCA Plan. The analysis was prepared by reviewing the applicable CDCA Plan requirements and concepts (including multiple-use, sustained yield, and maintenance of environmental quality) on Class L land and evaluating the proposal to determine whether it would be consistent with them. These guidelines provide that solar electrical generation facilities may be allowed in Class L areas in accordance with federal, state, and local laws subject to approval of a CDCA Plan amendment by the BLM. A variety of resources were reviewed and relied upon in preparing this analysis, including but not limited to BLM’s Land Use Planning Handbook (BLM, 2005); other BLM manuals, including BLM Manual 6840 concerning Special Status Species Management (BLM, 2008); BLM Instruction Memorandum No. 2008-014, concerning the Clarification of Guidance and Integration of Comprehensive Travel and Transportation Management Planning into the Land Use Planning (BLM, 2007a); and the CDCA Plan.

4.10.2 Applicant Proposed Measures

There are no APMs to address potential effects to lands and realty.

4.10.3 Alternative 1: Proposed Action

4.10.3.1 Direct and Indirect Impacts

Proposed Action

This impact assessment is based on known impacts relative to construction, operation, maintenance, and decommissioning of ROWs and land use permits of all types on BLM-administered land. Potential land use conflicts are identified and evaluated based on existing land uses, land uses proposed as part of the Proposed Action and Alternatives, federal land use designations established in the CDCA Plan, and BLM land use-related standards and policies. Land use compatibility is based on the intensity and patterns of land use to determine whether the Project would result in incompatible uses or nuisances.

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

Fiber optic cables would be co-located with the gen-tie and distribution lines. On site, fiber optic cable could be buried at the solar plant site. This underground cable would not cross over any existing authorized underground use.

Impacts to Land Use Plans

The Applicant is requesting a ROW grant (Application CACA-048728) from the BLM for approximately 7,700 acres of public land. The Project site is within the BLM’s California Desert District and within the planning boundaries of the CDCA Plan. If a ROW grant is approved for the Project, then a land use plan amendment also would be required to identify the site in the CDCA Plan as an appropriate site for the proposed use. The site is classified as “Class L” or limited use, in which electrical generation facilities, including solar generation, may be allowed after NEPA requirements are met. The total acreage of the Class L designation that would be permanently affected by the Project would be 3,960 acres for the solar plant and approximately 59 acres for the proposed Eastern Route for the gen-tie line, access road, and switchyard, or a total of 4,019 acres. Construction would result in disruptions to existing allowable land uses, in particular, on-site recreation activities (OHVs) as discussed in Section 4.14, *Recreation and Public Access*. No changes in the MUC classification would be required prior to approving the ROW grant, and as discussed in the consistency analysis above, the land use activities associated with the Project would be consistent with MUC Guidelines. Although the Project would be consistent with MUC Guidelines, approval of the ROW grant would restrict use opportunities on the Project site to a single use for the anticipated 30-year lifespan of the Project, making this land unavailable for other uses. After the Project has been decommissioned, the Class L lands within the Project site boundary would again be available for multiple uses consistent with the MUC Guidelines.

A portion of the Project would also be constructed on approximately 477 acres of private land under the land use authority of Riverside County.

Impacts to Designated Corridors

Potential impacts to the designated corridors could occur as a result of the gen-tie line crossing the corridors on a nearly perpendicular alignment rather than following along the corridor path. Impacts to the corridors from the fiber optic line would be the same as the gen-tie line. However, with modern technology, impacts would be expected to be minimal, easily mitigated and would not preclude continued and future use of either designated corridor. Future use would be slightly constrained by placement of additional facilities within the corridors.

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

The Project facility would create no conflict with Corridors J, K, and 30-52 since the footprint of the facility would be completely outside these corridors. The distribution line would connect to an existing electric line located on the western edge of the corridor in Section 8, Township 6 South, Range 22 East, creating no known conflict.

The linear facilities that would affect Corridors K and 30-52 include the gen-tie line, fiber optic line, and access roads (I-10, Black Rock Road, and an estimated 0.5 mile of upgraded Black Creek Road). The gen-tie line would cross Corridors K and 30-52 and then proceed west along the southern side of the corridors for approximately 4 miles before turning south and exiting the corridors to connect with the CRS. There is no known conflict with the proposed gen-tie line either crossing over or lying within Corridors K and 30-52.

The fiber optic line would be placed on the gen-tie and distribution line support structures; therefore, no additional width for the fiber optic lines would be needed and no conflict with Corridors K and 30-52 has been identified.

Construction materials and personnel traveling to and from the Project would result in an increase in traffic on I-10, Black Rock Road, and the portion of the access road (Black Creek Road) lying with the corridors. The increased level of traffic would be temporary and would not result in a need for upgrading or widening of any of these roads; therefore, no conflict with Corridors K and 30-52 would result. Although there are numerous ROWs currently authorized within Corridors K and 30-52, a width in excess of 8,500 feet would remain within the corridors to accommodate the gen-tie line, leaving sufficient space to accommodate anticipated future needs. (Kershaw, 2011).

Impacts to Interstate 10

Potential impacts to I-10 from the overhead gen-tie line and fiber optic line would be mitigated by following requirements of the Federal Highway Administration (FHWA) and/or Caltrans, and industry standards (SOPs) and best management practices (BMPs) for aerial crossings of federal highways.

Impacts to Other Authorized Uses

As proposed, the gen-tie line would cross multiple existing linear ROWs both north and south of I-10. Once across the highway, the line would turn to the west and parallel the highway and existing power lines to the point of interconnection with the CRS. Potential impacts from the fiber optic cable would be the same as the overhead power line. These Project components would be consistent with the requirements of CPUC General Order No. 95 regarding the configurations of utility lines in shared ROWs. Construction and operation of these new linear facilities using industry SOPs and BMPs for crossing over existing authorized uses would effectively mitigate potential negative impacts to existing authorized users.

4.10.4 Alternative 2: Reduced Acreage

4.10.4.1 Direct and Indirect Impacts

The total acreage of the Class L designation that would be affected by construction of Alternative 2's solar plant site would be 1,782 acres, which would be 2,178 fewer acres than the Alternative 1 solar plant site. The Alternative 2 solar plant would be built within the ROW boundary of the Proposed Action. Therefore, as described above, there would be no impacts to existing uses from Alternative 2.

4.10.5 Alternative 3: Reconfigured Gen-tie/Access Road Routes

4.10.5.1 Central Route

Direct and Indirect Impacts

The Central Route would be incrementally shorter than the proposed gen-tie line and access road route, and so it would result in a slightly smaller area of Class L lands being unavailable for other allowable uses. Nonetheless, there would be no substantial difference between the Central Route and the Proposed Action.

The Central Route would not cross or be located within any designated corridors, nor would it cross other existing uses. The Central Route would be within a ROW reserved for the linear facilities associated with both BSPP and the Project and which can accommodate both projects, and would not conflict with the BSPP ROW. This alternative would have the same effects related to existing uses and established corridors.

4.10.5.2 Western Route

Direct and Indirect Impacts

The Western Route would be incrementally longer than the proposed gen-tie line and access road route, and so it would result in a slightly larger area of Class L lands being unavailable for other allowable uses. Nonetheless, there would be no substantial difference between the Western Route and the Proposed Action.

The Western Route would not cross or be located within any designated corridors, nor would it cross other existing uses. This alternative would have the same effects related to existing uses and established corridors.

4.10.6 Alternative 4: No Action Alternative

The No Action Alternative would result in no MSEP-specific impact with respect to lands and realty at the Project site because the BLM would not issue a ROW grant to the Applicant.

4.10.7 Cumulative Impacts

4.10.7.1 Geographic Scope

The geographic scope of the cumulative effects analysis for lands and realty includes the Project site and the location of ancillary facilities, as well as nearby designated utility corridors.

4.10.7.2 Temporal Scope

Potential cumulative effects on lands and realty could occur during the Project’s proposed 46-month construction period, 30-year projected lifespan, and decommissioning and closure period, as well as during the lifespan of other projects whose features may be located based on constraints imposed by implementation of the Project.

4.10.7.3 Impacts to Land Use Plans

The geographic scope of the cumulative effects analysis for multiple-use classes includes CDCA Plan area lands designated Class L in eastern Riverside County. This geographic scope was established based on the boundaries of the affected resource. As shown in Table 3.10-1 in Section 3.10, there are 550,087 acres of Class L lands in eastern Riverside County. The temporal scope of cumulative impacts would result throughout the life of the project. During this period, from start of construction to the completion of decommissioning activities, the existence of the Project would preclude the development of other uses on the site and, thereby, affect the type of use opportunities on Class L lands within the CDCA Plan area.

Existing conditions within the cumulative impacts area reflect a combination of the natural condition, Class L use opportunities presently being exercised, and, where such opportunities are not currently being exercised, the flexibility to elect to pursue one or more among them at some point in the future. The effects of past actions are reflected in the discussion in Chapter 3. Effects of the Project on MUCs, as analyzed above, relate to the opportunity cost of implementing the Project. If the Project or an alternative is developed on the site, the site cannot be used for other Class L use opportunities that otherwise would be available on the site. Past, present, and reasonably foreseeable future actions making up the cumulative scenario are identified in Section 4.1. Among them, projects that also would be developed wholly or partially on lands designated as Class L would similarly restrict available use opportunities within that classification for the duration of those projects. These projects include the Desert Southwest Transmission Line Project; the enXco McCoy, BSPP, Palo Verde 2, and Rio Mesa renewable energy projects; and the Eagle Mountain Landfill Project. The Project would remove approximately 4,019 acres, and Alternative 2 would remove 1,782 acres plus 59 acres (if paired with the Eastern Route) or slightly less (if paired with the Central Route) of Class L lands from availability for other uses.

The projects listed above and described in Table 4.1-4 would occupy over 40,000 acres of Class L lands in eastern Riverside County, for a total of approximately 44,000 and 42,000 acres including the Project's or Alternative 2's contribution, respectively. Of the total Class L lands in eastern Riverside County, the Project represents less than 1 percent, with a total cumulative effect of approximately 8 percent. Alternative 2 represents less than 0.5 percent with a total cumulative effect of approximately 7.6 percent. The contributions of the Alternative 3 gen-tie and access road routes would be negligible, with a difference of fewer than 10 acres compared to the proposed Eastern gen-tie line and access road route.

Since over 500,000 acres of Class L lands in eastern Riverside County would remain available for other uses; other classes of lands can also support some of the same uses Class L lands allow; and upon completion of decommissioning these lands would be available for other uses, no significant cumulative impact would result from the cumulative scenario to which the Project's incremental impact could contribute.

4.10.7.4 Impacts to Designated Corridors

Existing conditions within the cumulative impacts area reflect a combination of the natural condition and the effects of past actions and are described in PA/FEIS Chapter 3. Direct and indirect effects of the construction, operation and maintenance, and closure and decommissioning of the Project are analyzed above. Past, present, and reasonably foreseeable future actions making up the cumulative scenario are identified in Section 4.1. Among them, other ROW applications for projects that could be developed adjacent to the Project and that could be constrained by the Project's effects on land use include the approved BSPP and proposed enXco McCoy project, which could be developed directly to the south and north of the Project site, respectively. These projects each propose to tie into the CRS and portions of each gen-tie route would be developed as adjacent transmission lines. Impacts resulting from construction, operation, maintenance, and decommissioning of the Project could result in a cumulative effect on lands and reality in combination with these other past, present, or reasonably foreseeable future actions if future projects were constrained by the placement of Project-related facilities both within and outside of nationally and locally designated corridors, such that they were deemed infeasible or required to occupy other ROWs due to the Project's location.

Multiple ROW applications are pending in the vicinity of the Project, and the adjacent BSPP ROW grant application was approved in 2010. The Applicant would build a double-circuit 230 kV line to carry up to 750 MW from the Project site, and based on the available documentation for the transition cluster participants, Solar Millennium would build a double-circuit 230 kV line carrying 1000 MW from the BSPP site and enXco would build a double-circuit 230 kV line to support its enXco McCoy development efforts north of the Project site (BLM, 2010; Black, 2010).

BLM's general policy is to review ROWs in the order in which they are received, and the ROW grant for the BSPP site to the south was approved in 2010. However, each of the pending applications would be for a project on BLM land and it is in BLM's interest to have utilities on its property co-located in common utility corridors. Accordingly, BLM has asked the Applicant to provide connectivity through and around the Project site for use by the other proposed projects.

Two sets of policies are relevant to the co-location of parallel transmission lines. First, the WECC policy, described in Section 3.22.3, *Transmission Line Safety and Nuisance*, is to separate adjacent transmission lines with a distance that is equal to or greater than the longest span length of the transmission lines in question, which for the proposed Project is anticipated at 800 to 1,000 feet (WECC, 2011). Second, the most recent available CAISO grid planning standards specify the maximum amount of power that can be interrupted to maintain transmission system reliability as follows:

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

2. 1,400 MW of capacity can be interrupted under a double contingency (i.e. two transmission lines or circuits (including two circuits on a single tower), two transformer banks, etc.) (CAISO, 2008).

Of these two sets of policies, the WECC transmission line separation criterion appears most likely to constrain efforts to accommodate connectivity of the other proposed actions, because as proposed, the Project and the cumulative projects would not combine in a way that would exceed the listed CAISO grid planning standards. The Project's gen-tie line would roughly follow the eastern border of the BSPP site after exiting the Project site, then turn southwest, paralleling the BSPP gen-tie line beginning south of the BSPP site and continuing across I-10 and west to the CRS. The proposed enXco McCoy project could achieve connectivity to the CRS either via the western borders of the Project and BSPP sites or by extending east until reaching designated Corridor J, then crossing or turning west within Corridors K and 30-52 and paralleling the Project and BSPP gen-tie lines on the southern border of Corridors K and 30-52 until reaching the CRS. There remains sufficient capacity within Corridor J to accommodate up to 50 new transmission or gas lines and/or expansion of existing uses (Kershaw, 2011). For the portions of the gen-tie lines that would be parallel to one another, the necessary minimum combined width of the corridor containing the three lines would be at least 2,100 feet.[1] There are no apparent land constraints along the proposed route that would make this width infeasible.

The Project would not constrain lands or realty for reasonably foreseeable future projects in a way that would make them infeasible or that would result in adverse impacts to land use and realty.

If the Alternative 3 Central Route were implemented, the enXco McCoy gen-tie would be able to follow either the eastern or western borders of the Project and BSPP sites. If the Alternative 3 Western Route were implemented, the enXco McCoy gen-tie would be able to follow the eastern borders of the Project and BSPP sites. The contribution of these alternatives to a cumulative lands and realty effect would be the same as the Project.

4.10.8 Mitigation Measures

No mitigation measures are required to reduce impacts related to lands and realty and land use planning. The Project would conform to power industry standards and best practices for the collocation of utility lines. The portion of the Project that is proposed to cross I-10 would be consistent with the requirements of Caltrans' encroachment permit, eliminating land use impacts related to encroachment of highways.

4.10.9 Residual Impacts after Mitigation Incorporated

Because no mitigation measures are recommended, impacts to lands and realty would be the same as discussed in Section 4.10.3, *Alternative 1: Proposed Action*.

4.10.10 CDCA Plan Consistency

The Project site is located in the CDCA planning area within Class L lands. The total area of Class L lands that would be affected by construction of the Project would be approximately 4,019 acres. Approval of the ROW grant would restrict multiple-use opportunities on the Project site to a single dominant use for the anticipated 30-year lifespan of the Project. This restriction would be lifted upon closure and decommissioning of the Project; thereafter, use opportunities on the site could return to the pre-Project conditions discussed in Section 3.10.

Land uses that are not in conformance with the CDCA Plan would require a plan amendment. As noted above, the proposed Project site is not expressly identified in the CDCA Plan as a solar energy generation site. Consequently, a CDCA Plan amendment would be required.

The process for considering amendments to BLM land use plans is described in the agency's *Land Use Planning Handbook* (BLM, 2005). The general process for amending a BLM Land Use Plan is as follows:

1 This includes 1,000 feet between each line to comply with WECC standards, plus a 50-foot allowance on either side of the two outside lines, as is proposed for the Project gen-tie line.

1. The plan amendment process would be completed in compliance with FLPMA, NEPA, and all other relevant federal law, executive orders, and BLM management policies.
2. The plan amendment process would include an EIS to comply with NEPA.
3. Where existing planning decisions remain valid, those decisions may remain unchanged and would be incorporated into the new plan amendment.
4. The plan amendment would recognize valid existing rights.
5. Native American tribal consultations would be conducted in accordance with policy, and tribal concerns would be given due consideration.
6. Consultation with other agencies with jurisdiction would be conducted throughout the plan amendment process.

Chapter 7 of the CDCA Plan details the plan amendment process. The Project proposes a Category 3 amendment because it requests a specific use or activity, which is not currently authorized by an existing plan element—specifically, the Energy Production and Utility Corridors Element. In analyzing the request to amend the CDCA Plan, the analysis of the proposed amendment will:

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

Details concerning the proposed amendment for the Project or an alternative are provided in Chapter 2, *Proposed Action and Alternatives*. This PA/FEIS acts as the mechanism for satisfying NEPA requirements for the CDCA Plan Amendment process, and provides the analysis required to support a CDCA Plan Amendment to identify the proposed site as suitable or unsuitable for solar development within the Plan.

As analyzed above, all of the BLM-administered lands proposed for use by the Project and alternatives are classified in the CDCA Plan as Class L. MUC designations govern the type and degree of land uses allowed within the classification area. All land use actions and resource-management activities on BLM-administered lands within a MUC delineation must meet the guidelines for that class. These guidelines are provided in Table 1, Multiple-Use Class Guidelines, of the CDCA Plan.

The Class L designation allows electric generation plants for solar facilities to be developed in accordance with federal, state, and local regulations after NEPA requirements are met. The specific application of the MUC designations and resource management guidelines for a specific resource or activity are further discussed in the plan elements section of the CDCA Plan. In Class L designations, the AO is directed to use judgment in allowing for consumptive uses by taking into consideration the sensitive natural and cultural values that might be degraded.

The site of the Project and alternatives analyzed above meets the MUC Guidelines as noted in the CDCA Plan for the resources listed below. See Table 3.10-2, *Multiple-Use Class L Land Use and Resource Management Guidelines*, in Section 3.10.

For purposes of this discussion, the terminology “Proposed Action and Alternatives” is used herein since the classification of the BLM-administered portion of the site of the Proposed Action and Alternatives 2 through 6 would be the same (Class L).

4.10.10.1 Agriculture

Agricultural uses of Class L lands are not allowed, with the exception of livestock grazing. The site is not currently used for agriculture and the Project would not involve use of the site for agriculture.

4.10.10.2 Air Quality

Class L lands are to be managed to protect air quality and visibility in accordance with Class II objectives of Title I, Part C of the CAA as amended. The anticipated maximum annual and daily construction emissions that would be associated with the Project are provided in Tables 4.2-2 and 4.2-3 of Section 4.2, *Air Resources*. The analysis indicates that with the exception of PM10 impacts during construction, the Project would not create new exceedances or contribute to existing exceedances for any of the criteria air pollutants. Maximum annual construction emissions would not exceed any of the applicable general conformity de minimis thresholds. The maximum daily and annual operation emissions that would be associated with the Project are provided in Tables 4.2-4 and 4.2-5. Annual operation emissions are anticipated to be well under the general conformity de minimis thresholds. The magnitude of the impacts of decommissioning emissions are expected to be significantly less than those estimated for Project construction since decommissioning would occur after at least 30 years of operation, and it is expected that on-road and off-road equipment engine technology would be far more advanced and cleaner than is currently the case. Therefore, the Project would conform to the CAA Class II objectives referenced in the CDCA Plan MUC guidelines.

4.10.10.3 Water Quality

The CDCA Plan states that Class L lands are to be managed "to provide for the protection and enhancement of surface and groundwater resources" using the BLM's BMPs prepared in compliance with the CWA §208 and Executive Order 12088, both of which address federal compliance with pollution control standards (BLM, 1980, p. 15). The BMPs that are relevant to the Project would be applied during implementation of Mitigation Measures WATER-1 through WATER-3, described in Section 4.20, *Water Resources*. With implementation of these surface and groundwater quality BMPs, impacts to water resources and water quality would be minimal, and the Project would conform to the CDCA Plan guidelines for Class L lands.

4.10.10.4 Cultural and Paleontological Resources

Cultural and paleontological resources are to be preserved and protected within Class L lands, and procedures described in 36 CFR 800 are to be observed where applicable. As described in detail in Sections 4.5, *Cultural Resources*, and 4.13, *Paleontological Resources*, impacts on cultural and paleontological resources resulting from the construction, operation and maintenance, and decommissioning of the Project would be mitigated and would conform to the MUC Guidelines. Adverse effects on cultural resources listed on or determined eligible for the NRHP would be resolved in accordance with a MOA being prepared for the Project in consultation with the California SHPO, Indian tribes, and other interested parties in accordance with NHPA §106.

4.10.10.5 Native American Values

Under the MUC Guidelines, Native American cultural and religious values are to be protected and preserved and the appropriate Indian tribes are to be consulted. Consultation with Indian tribes was initiated during planning phase of the Project and will continue during the NEPA process (Section 4.5, *Cultural Resources*, and Chapter 5, *Consultation, Coordination, and Public Involvement*, describe the Native American consultation processes). Opportunities have been provided to allow Indian tribes to identify places and resources of importance to them and to express concerns regarding cultural and religious values that could be affected by the Project.

Adverse effects on any places of traditional cultural or religious importance that are identified by tribes would be resolved in accordance with the MOA being developed for the Project with tribal participation. Potential impacts to and protection of cultural resources are discussed in more detail in Section 4.5, *Cultural Resources*. Collectively, these measures ensure that preservation and protection of Native American cultural and religious values associated with cultural resources is accomplished in accordance with the CDCA Plan MUC Guidelines.

4.10.10.6 Electrical Generation Facilities

Solar generation may be allowed on Class L lands after NEPA requirements are met. This PA/FEIS represents the mechanism for complying with the NEPA requirements.

4.10.10.7 Transmission Facilities

Class L guidelines allow electric transmission to occur in designated ROW corridors. The Project would require a 230 kV gen-tie line to interconnect Project generation output with the CRS that would not be within a designated ROW corridor. The CDCA Plan requires that all sites associated with power generation or transmission not identified in the Plan be considered through the Plan Amendment process. Therefore, the BLM would undertake a Project-specific CDCA Plan amendment along with the ROW grant for the Project. Upon BLM's amendment of the CDCA plan for the Project, the Project would be fully compliant with the CDCA Plan. This PA/FEIS acts as the mechanism for meeting NEPA requirements, and also provides the analysis required to support a Plan Amendment identifying the facility within the Plan.

4.10.10.8 Communication Sites

Communication sites may be allowed on Class L lands after NEPA requirements are met. The Project would not involve installation of communications sites and therefore would not be affected by the MUC guidelines for this land use activity.

4.10.10.9 Fire Management

The Project site is located in a FRA under the jurisdiction of BLM, and the site is within a moderate FHSZ. As part of the Project, the Applicant would implement the fire prevention and suppression measures described in Section 2.3.1.4.11, *Vegetation Management and Fire Protection Systems*, including submitting an EAP for use during construction, and installing a fire protection system that includes on-site water storage, hydrants, and fire extinguishers. Additionally, as described in Section 4.21, *Wildland Fire Ecology*, Mitigation Measure FIRE-1 requires the Applicant to prepare and implement a Fire Safety Plan in consultation with the BLM to reduce the risk of fire and to train personnel to respond to fires on site. 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 Safety Plan and, therefore, would conform to the MUC guidelines for Fire Management for Class L lands.

4.10.10.10 Vegetation

Table 1 of the CDCA Plan includes a variety of guidelines associated with vegetation as follows:

Vegetation Harvesting

Native Plants. Commercial or non-commercial removal of native plants in Class L areas may be allowed only by permit after NEPA requirements are met, and after development of necessary stipulation. Approval of a ROW grant for the Project would constitute the permit for such removal. The conditions of approval that would be required in a Record of Decision would constitute the stipulations to avoid or minimize impacts from removal of native plants.

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

Rare, Threatened, and Endangered Species, State and Federal. In all MUC areas, all federal and state-listed species are to be fully protected. In addition, actions that may jeopardize the continued existence of federally listed species will require consultation with the USFWS. As evaluated in Section 4.3, *Biological Resources – Vegetation*, no federal or state-listed plants would be affected by the Project.

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 (BLM, 2008). 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. Six special-status plants were identified, of which one, Harwood's eriastrum (*Eriastrum harwoodii*), is considered a BLM-sensitive plant. Impacts and mitigation measures associated with this species and other special-status plant species are discussed in Section 4.3, *Biological Resources - Vegetation*. Mitigation measures included in this PA/FEIS would reduce the number of individuals of the species that would be affected. Because these measures are intended to reduce threats to these species to minimize the likelihood of listing, these measures are in conformance with the MUC guidance in the CDCA Plan.

Unusual Plant Assemblages. No unusual plant assemblages have been identified on the Project site.

Vegetation Manipulation

Mechanical Control. Mechanical control may be allowed on Class L lands 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. During construction, O&M, and decommissioning phases, the Applicant would abide by noxious weed control procedures as developed in cooperation with the BLM. The establishment of noxious/invasive vegetation can be limited by early detection and eradication. The Applicant would finalize the site-specific Vegetation Management Plan, described in Section 2.3.1.4.11, *Vegetation Management and Fire Suppression*, prior to a ROW grant being issued. Such actions would be conducted as part of the Project. Vegetation management under the Vegetation Management Plan would conform to federal, state, and local regulations.

Chemical Control. Aerial broadcasting application of chemical controls is not be allowed on Class L lands. Noxious weed eradication may be allowed after site-specific planning. The Project would not include aerial broadcasting. As described in Section 2.3.1.4.11, *Vegetation Management and Fire Suppression*, a plan would be developed for control of noxious weeds and invasive species that could occur as a result of surface disturbance activities at the Project site.

The plan would address monitoring, education of operation and maintenance personnel on weed identification, the manner in which weeds spread, use of any pesticides, and methods for treating infestations. Vegetation would be managed with a BLM-approved herbicide in accordance with guidance provided in the BLM Programmatic EIS for Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM, 2007b) and by the PSSCFO.

Exclosures. Exclosures may be allowed on Class L lands. Exclosure is a manipulation technique where livestock and certain wildlife species can be excluded from fenced areas. This procedure provides comparison data and is valuable in the determination of grazing effects of vegetation. The Project would not include exclosures.

Prescribed Burning. Prescribed burning may be allowed on Class L lands after development of a site-specific management plan. The Project would not include prescribed burning.

4.10.10.11 Land Tenure Adjustment

Class L land may be sold in accordance with FLPMA and other applicable federal laws and regulations. The Project would not involve the sale of any BLM-administered lands.

4.10.10.12 Livestock Grazing

Livestock grazing is allowed on Class L lands subject to the protection of sensitive resources. The Project would not involve livestock grazing.

4.10.10.13 Minerals

The Project would not involve the development of minerals on Class L lands.

4.10.10.14 Motorized Vehicle Access/Transportation

Pursuant to the CDCA MUC guidelines for Class L areas, new roads and ways may be developed under ROW grants or approved plans of operation, and periodic or seasonal closures or limitations of routes of travel may be required. The Project would not include new OHV designations. However, construction of the Project would result in short-term closures or access limitations to portions of OHV routes 660637, 660703, 660709, 660712, 660835, 660857, 660858, 660860, 661085, and 661089, and operation and maintenance of the Project would result in long-term closures of portions of OHV routes 660835 and 661085 as described in Section 4.14, *Recreation and Public Access (Off-Highway Vehicles)*.

4.10.10.15 Recreation

The Project would not involve use of the Project site for recreational uses.

4.10.10.16 Waste Disposal

The Project would not involve the development of waste disposal sites.

4.10.10.17 Wildlife Species and Habitat

Table 1 of the CDCA Plan includes a variety of guidelines associated with wildlife as follows:

> **Rare, Threatened, and Endangered Species, State and Federal.** In all MUC areas, all state and federally listed species and their critical habitat are to be fully protected. In addition, actions that may impact or jeopardize the continued existence of federally listed species require consultation with the USFWS in accordance with FESA §7. As evaluated in Section 4.4, *Biological Resources - Wildlife*, the desert tortoise is the only federally listed species potentially affected by the Project. Mitigation Measures developed as part of the Project would avoid, minimize, and/or compensate for potential effects to desert tortoise. As specified in the guideline, BLM will initiate formal consultation with the USFWS in accordance with FESA §7. BLM has worked with USFWS, CDFG, and the Applicant to develop protection and compensation measures for the desert tortoise. Therefore, the Project would comply with the guideline to provide full protection to the species.
>
>> ***Sensitive Species.*** On Class L lands, identified species are to 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. Several BLM-sensitive wildlife species present or likely to occur on habitat associated with the Project include, but are not limited to Mojave fringe-toed lizard, burrowing owl, Le Conte's thrasher, Golden Eagles, and migratory birds and bats. Those species that are likely to occur on the Project site would be protected under a number of mitigation measures meant to avoid, minimize, or compensate for impacts from the Project as discussed in detail in Section 4.4, *Biological Resources - Wildlife*.
>>
>> ***Predator and Pest Control.*** Control of depredation wildlife and pests is to be allowed on Class L lands in accordance with existing state and federal laws. As part of the Project, the Applicant would develop a litter control program that would be enforced during construction and operation and maintenance phases to reduce the likelihood that litter would attract predators (e.g., common raven) to the area and consequently increase the likelihood of predation on special status species (e.g., desert tortoise). Therefore, this guideline is applicable to these actions but is allowed subject to conformance with state and federal laws.
>
> **Habitat Manipulation.** The Project would not include habitat manipulation.
>
> **Reintroduction or Introduction of Established Exotic Species.** The Project would not include the reintroduction or introduction of exotic species.

4.10.10.18 Wetland/Riparian Areas

No wetlands or riparian areas are present on the Project site.

4.10.10.19 Wild Horses and Burros

No wild and free-roaming horses or burros are present on the Project site.

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4.11 Mineral Resources

4.11.1 Methodology for Analysis

Impacts of the Project on mineral resources were assessed based on the degree to which the Project would reduce the availability of mineral resource areas identified within the study area. Information on the type and extent of mineral resources present in the study area was described in the setting (Section 3.11, *Mineral Resources*) using applicable geologic maps and mineral resource databases. Construction, operation, maintenance, and decommissioning activities for the Project are analyzed in terms of their direct and indirect effects on existing mineral leases and claims, and the future availability of or access to areas containing mineral resources.

4.11.2 Applicant Proposed Measures

There are no APMs to address potential effects to mineral resources.

4.11.3 Alternative 1: Proposed Action

4.11.3.1 Direct Impacts

As discussed in Section 3.11, *Mineral Resources*, the Project site currently is not used for mineral production, nor is it under claim, lease, or permit for the production of locatable, leasable, or salable minerals or mineral materials. However, during construction, operation, maintenance, and decommissioning of the Project, approximately 4,496 acres of land would be unavailable for mineral exploration or extraction. This would not directly affect locatable or leasable minerals because none are present on the Project site. However, the Project site is underlain by sand and gravel, which potentially could represent a source of saleable minerals or mineral materials if there is a sufficient local demand for construction aggregate.

The fact that the Project would make approximately 4,496 acres of land unavailable for the life of the Project represents a minor adverse impact on mineral resources for several reasons:

1. As discussed in Section 3.11, *Mineral Resources*, deposits of similar age and lithology that are likewise potential sources of sand and gravel are estimated to underlie 1,544,000 acres of eastern Riverside County.

2. There is no information to indicate that the sand and gravel underlying the site is unique, of higher quality, or any more marketable than other similar deposits that are widespread throughout eastern Riverside County.

3. There is an existing producer of sand and gravel located along Midland Road, in close proximity to the Blythe Landfill, which likely would be able to serve local future demand for sand and gravel.

4. Following the decommissioning of the Project, the land occupied by the Project would again be made available for applications to the BLM for exploration or production of aggregate construction materials.

4.11.3.2 Indirect Impacts

Indirect impacts could occur if Project-related closure or blockage of public roads or access routes reduces access to any off-site mineral resource areas. As discussed in Section 4.14, *Recreation and Public Access*, and Section 4.17, *Transportation and Traffic*, the Project would not block or otherwise impair access to a major public roadway. While the Project would interrupt several open OHV routes, the routes have low levels of usage for dispersed recreation. The presence of the Project would not prevent permitted prospectors or owners of mineral leases in the surrounding region from accessing areas outside the footprint of the Project, such as the McCoy Mountains because there are other routes available to access the surrounding mountains, and motorized travel would continue to be permitted to the public within wash open zones.

4.11.4 Alternative 2: Reduced Acreage

4.11.4.1 Direct and Indirect Impacts

Alternative 2 would cause the same types of mineral resource-related impacts as the Proposed Action, i.e., impacts related to the loss of availability of a known mineral resource that would be of value to the region and California residents and to the loss of availability of a locally important mineral resource recovery site for the duration of the Proposed Action. However, because the solar plant site would be smaller for Alternative 2 than for the Proposed Action, the construction, operation, maintenance, and decommissioning activities associated with Alternative 2 would affect and occupy a smaller area and, thereby, affect fewer potential mineral resources.

4.11.5 Alternative 3: Reconfigured Gen-tie/Access Road Routes

4.11.5.1 Central Route

Direct and Indirect Impacts

The Central Route would cause the same types of mineral resource-related impacts as the Proposed Action, although the location of the impacts associated with the proposed gen-tie line and access road route would be shifted to the west relative to the Proposed Action. The Central Route would be slightly shorter than the proposed gen-tie line and access road route. Consequently, activities associated with construction, operation, maintenance, and decommissioning of this Alternative would affect or occupy a slightly smaller area of potential mineral resources. Nonetheless, there would be no substantial difference between the Central Route and the Proposed Action.

4.11.5.2 Western Route

Direct and Indirect Impacts

The Western Route would cause the same types of mineral resource-related impacts as the Proposed Action. The Western Route would be slightly longer than the proposed gen-tie and access road route. Consequently, activities associated with construction, operation, maintenance, and decommissioning of the Western Route would affect or occupy a slightly larger area of potential mineral resources. Nonetheless, there would be no substantial difference between the Western Route and the Proposed Action.

4.11.6 Alternative 4: No Action Alternative

The baseline conditions associated with mineral resources would continue under the No Action Alternative. Under this Alternative, the footprint of the Project would remain available for applications to the BLM for solar development, mineral exploration, or other uses consistent with the CDCA Plan.

4.11.7 Cumulative Impacts

The geographic scope of cumulative effects with respect to mineral resources would include all areas underlain by sand and gravel within eastern Riverside County, as sand and gravel represents a potential source of saleable minerals or mineral materials. Projects that put land areas to other uses, such as urban development or the construction of energy facilities, could incrementally combine to reduce the availability of aggregate. Therefore, all of the other projects in the cumulative scenario are considered within the geographic scope of analysis. As discussed above, the Project would have a minor adverse impact on mineral resources since sand and gravel is a widespread resource that underlies most of the desert basins in the region. If the enXco, the BSPP, and all of the other projects in the cumulative scenario were to be implemented, the resulting loss of land could amount to as much as 316,675 acres, 225,000 of which would be for the purpose of renewable energy development. Although this represents a considerable amount of land, there are approximately 1,544,000 acres of land underlain by Quaternary geologic units within eastern Riverside County. Even if all projects were implemented and were in operation at the same time, over 1,200,000 acres would remain available for aggregate resource exploration and production.

4.11.8 Mitigation Measures

No mitigation measures are recommended.

4.11.9 Residual Impacts after Mitigation Incorporated

Because no mitigation measures are recommended, impacts to mineral resources would be the same as discussed in Section 4.11.3, *Alternative 1: Proposed Action*.

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4.12 Noise

This section describes the conditions related to noise that would occur during construction, operation, maintenance, and decommissioning of the Project and alternatives. Cumulative impacts and mitigation measures to reduce any cumulative impacts also are identified.

4.12.1 Methodology for Analysis

This analysis evaluates potential noise impacts of the Proposed Action and alternatives based on review of sensitive receptors, ambient noise levels, and projected noise levels that would be associated with construction, operation, maintenance, and decommissioning of the Project and alternatives. Impact discussions are based, in part, on the modeled noise levels of the Project as presented in an acoustical analysis provided by the Applicant (Tetra Tech EC, Inc., 2011) that was peer reviewed by BLM. The following methods were used to evaluate impacts.

4.12.1.1 Short-term Construction and Decommissioning Noise Impacts

Although there are no applicable local policies or standards available to judge the effects of short-term construction noise levels, the FTA has identified a daytime 8-hour L_{eq} level of 80 dBA as a noise level where adverse community reaction to short-term construction noise could occur (FTA, 2006). Therefore, noise levels at nearby sensitive receptor locations associated with short-term construction and decommissioning activities are compared to an 8-hour L_{eq} level of 80 dBA.

4.12.1.2 Long-term Operation and Maintenance Noise Impacts

The USEPA-recommended residential noise guideline is an L_{dn} of 55 dBA. This level is not a regulatory goal but is “intentionally conservative to protect the most sensitive portion of the American population” with “an additional margin safety” (USEPA, 1974). This analysis also identifies whether noise level increases associated with long-term operation and maintenance activities would exceed 3 dBA at sensitive receptor locations.

Vibration Impacts

A PPV threshold identified by Caltrans is used in this analysis to determine the level of vibration impacts related to adverse human reaction and risk of architectural damage to normal buildings.[1] The PPV threshold is 0.20 inches per second (in/sec) (Caltrans, 2004). This PPV level has been found to be annoying to people in buildings and can pose a risk of architectural damage to buildings.

[1] Architectural damage could be structural damage, such as cracking of floor slabs, foundations, columns, beams, or wells, or cosmetic architectural damage, such as cracked plaster, stucco, or tile (Caltrans, 2004).

4.12.2 Applicant Proposed Measures

There are no APMs to address potential effects from noise.

4.12.3 Alternative 1: Proposed Action

4.12.3.1 Direct and Indirect Impacts

Construction

Construction of the Project is expected to occur over a period of 46 consecutive months. Unit 1 and associated linear facilities (e.g., gen-tie and access roads) would be constructed first, followed by the construction of Unit 2. Construction would likely occur in three phases. Phase 1 would consist of site preparation and construction of on-site infrastructure. The site would be prepared with the removal of vegetation, the compaction of soils, and any necessary grading. Construction of the on-site infrastructure would include the main access road, stormwater containment, fencing, etc. Phase 2 would include the construction of the generating equipment, which would involve on-site trenching and installation of electrical collection systems, installation of PV arrays, foundation construction and tracker installation, PV array installation on the tracker systems, and construction of the on-site substations. Phase 3, which would occur concurrently with Phases 1 and 2, would include the construction of the interconnection infrastructure for connection to the CRS, including construction of the proposed gen-tie line and telecommunications line, the switchyard, and the distribution line.

Noise levels that would be associated with construction of the Project were evaluated using a screening-level analysis approach. The calculation methodology required knowledge of the numbers and types of proposed construction equipment as well as the typical noise source levels associated with each piece of equipment to determine the composite sound levels for standard distances of 50 feet and 1,000 feet from the construction activities. The composite noise levels were calculated assuming that all of the equipment would operate simultaneously at maximum load usage, to ensure a conservative screening level assessment. Table 4.12-1 summarizes results of the assessment by construction phase in terms of L_{max} noise levels.

Noise level exposures would fluctuate, depending on the construction activity, equipment type, and distance between noise sources and receptors. Noise from construction equipment would vary depending on the construction phase and the number and class of equipment that would operate at a location at any given time. Based on the noise levels provided in Table 4.12-1, maximum noise levels from construction activities that could occur at the solar plant site would be approximately 33 dBA at the closest identified residence located 2.6 miles away, and noise levels from construction activities associated with the gen-tie and access road would be approximately 46 dBA at the closest residence located approximately 0.6 mile from the proposed route.

In addition to on-site construction equipment noise levels, off-site traffic associated with Project construction activities would contribute to overall environmental noise levels. As described in Section 4.17, *Transportation and Traffic*, construction-related traffic would be expected to result

TABLE 4.12-1
REPRESENTATIVE L_{MAX} CONSTRUCTION NOISE LEVELS BY CONSTRUCTION PHASE

Phase No.	Construction Phase	Example Construction Equipment	Equipment Noise Level at 50 feet, dBA	Composite Noise Level at 50 feet, dBA	Composite Noise Level at 1,000 feet, dBA
1	Mobilization, Site Preparation, and Grading	Backhoe Fork Lift Dozer Excavator Grader Loader Roller Scraper Trencher Water Truck Portable Generator Flatbed Truck Heavy Duty Delivery Truck Light Weight Truck	80 80 85 85 85 80 85 85 73 80 82 75 85 75	94	59
2	PV Solar Array Installation and Substation Construction	Backhoe Crane Vibratory Post Driver Fork Lift Dozer Excavator Grader Loader Scraper Trencher Water Truck Portable Generator Flatbed Truck Heavy Duty Delivery Truck Light Weight Truck	80 85 90 80 85 85 85 80 85 73 80 82 75 85 75	96	61
3	Interconnection infrastructure, including Gen-Tie and Telecommunications Lines	Crane Vibratory Post Driver Fork Lift Loader Trencher Water Truck Portable Generator Flatbed Truck Heavy Duty Delivery Truck Light Weight Truck	85 90 80 80 73 80 82 75 85 75	93	59

SOURCE: Tetra Tech, 2011.

in up to 360 peak-hour trips along I-10, east of Mesa Drive. This would represent a 12 percent increase in peak-hour traffic along I-10, which would be expected to increase ambient noise levels along I-10 by less than 1 dBA, which would not be perceivable.

Project construction-related traffic along Black Rock Road and the BSPP access road, which would be shared with the Project, would be expected to result in up to 600 peak-hour trips. The closest residence to the applicable segment of Black Rock Road is located south of I-10 at a distance of 500 feet, and the closest residence to the BSPP access road is at a distance of approximately 0.5 mile. The Federal Highway Administration Traffic Noise Model (TNM) Version 2.5 Lookup Tables were used to estimate the noise level that would be associated with the 600 peak-hour trips. Assuming that approximately 20 percent of the trips would be medium trucks and 80 percent would be standard automobiles, all traveling at 60 miles per hour, the modeling results indicate that Project-related peak-hour traffic noise would be up to 48 dBA L_{eq} at 500 feet from the centerline of Black Rock Road and the BSPP access road. This noise level would likely be indistinguishable from I-10 traffic noise along Black Rock Road, and the noise level at the nearest residence along the BSPP access road would be substantially less given that the closest residence to the BSPP access road is much farther than 500 feet. On-site and off-site short-term Project-related noise would result in noise levels at the nearest sensitive receptor locations that would be substantially less than 80 dBA L_{eq}.

Temporary sources of groundborne vibration and noise during construction would result from operation of conventional heavy construction equipment such as graders, bulldozers, and loaded haul trucks. These pieces of equipment can generate vibration levels of up to 0.09 in/sec at a distance of 25 feet (Caltrans, 2004). However, vibration levels attenuate rapidly from the source. At a distance of 0.6 mile, which is the approximate distance between the closest residences and any of the Project components involving active heavy construction equipment, vibration would not be perceivable.

Groundborne noise is the rumbling sound of structure surfaces caused by high vibration levels. Because Project construction would not result in exposure of persons to or generation of excessive groundborne vibration, it also would not expose them to or generate excessive groundborne noise levels.

Operation and Maintenance

The Project would result in five potential sources of long-term noise, including operation of the solar power plant equipment, the on-site substations, on-site maintenance activities, off-site commuting workers and delivery trips, and gen-tie corona noise. Below are discussions of the noise effects that would be associated with each of the long-term noise sources.

Solar Power Plant Site

The proposed PV solar arrays would be organized in 2 MW blocks consisting of PV modules and a power conversion station (PCS). The main sources of noise associated with each PCS would be the cooling-ventilation fans, the electrical components of the inverters, and the step-up transformers that would service each inverter cluster.

In addition to the PCS sound sources, the on-site substations would have switching, protection, and control equipment and transformers, which would generate a sound that could generally be described as a low humming. There would be three main sound sources associated with a transformer, including core noise, load noise, and noise generated by the operation of the cooling equipment. The core noise would be the principal noise source and would not vary significantly with electrical load. Load noise primarily would be caused by the load current in the transformer's conducting coils (or windings) and consequently the main frequency of this sound would be twice the supply frequency; i.e., 100 Hz for 50 Hz transformers and 120 Hz for 60 Hz transformers. Cooling equipment (i.e., fans and pumps) noise would be comparatively lower and generally would be considered secondary to the sound produced by the core and load. Breaker noise would be very short duration sound events, expected to occur only a few times throughout the year.

DataKustic GmbH's CadnaA (v 4.2.139), a computer-aided noise abatement program, was used to conduct the operational acoustic modeling analysis associated with the solar power plant equipment. CadnaA is a comprehensive three-dimensional acoustic software model that conforms to the Organization for International Standardization standard 9613-2 *Attenuation of Sound during Propagation Outdoors*. The engineering methods specified in this standard consist of full (1/1) octave band algorithms that incorporate geometric spreading due to wave divergence, reflection from surfaces, atmospheric absorption, screening by topography and obstacles, ground effects, source directivity, heights of both sources and receptors, seasonal foliage effects, and meteorological conditions.

Noise sound power data for the inverters and transformers were obtained from the Applicant and used as input for the modeling analysis. Solar plant site components, including all PCSs and on-site substations, were assumed to be operating concurrently for 100 percent of the time, which is an extremely conservative assumption given that solar PV facilities only produce electricity during the daylight hours. After sunset, when the plant no longer receives solar radiation, the inverters would produce noise that would be minimally perceivable and the transformers would be energized, but would likely operate under low noise conditions using natural draft cooling (i.e., no fans) due to reduced nighttime heat loads. A three-dimensional rendering of the facility was created directly from the preliminary site plan drawing by defining the height and extent of all modeled noise sources. Sound power levels were assigned for each source in a manner that best represents their expected acoustic performance and were inclusive of a standardized engineering safety factor.

Sound level results from the acoustic modeling are in 5 dBA increments projected on a scaled USGS orthophoto map, as presented in Figure 4.12-1. The sound contour isopleths are plotted at a height of 1.52 meters above ground level, which is approximately the ear height of a standing person. Received sound levels were also evaluated at discrete receptor locations (i.e., existing residences) as shown in Table 4.12-2.

Table 4.12-2 shows that solar plant operation sound levels at the nearest residences would be low, likely due to a combination of the low-level noise generated by the Project and the substantial distance between the solar plant site and the closest residences. In summary, the results of the acoustic modeling analysis demonstrates that the solar power plant site would operate well within USEPA noise guidelines at all existing residences. In addition, noise levels associated with the solar power plant would be well below ambient conditions at the nearest sensitive receptors,

TABLE 4.12-2
SUMMARY OF SOLAR PLANT ACOUSTIC MODELING RESULTS

Receptor ID	UTM Coordinates (meters)		Received Sound Level (dBA)
	Easting	Northing	
4	714947	3734539	12
11	715279	3730900	13
12	716179	3730280	9
13	713965	3727803	10
14	712707	3725162	10
15	712420	3724507	6
16	712509	3724597	9
261	709207	3724642	11
262	709822	3724483	10
263[a]	---	---	14

NOTE: Only receptors with received sound levels greater than 0 dB are included in the table.

[a] Receptor ID 263 was not included in the Tetra Tech acoustical analysis, but has been added to this table and Figure 4.12-1 for full disclosure. The received sound level has not been modeled for this receptor; however, the received sound level has been estimated based on the distance from Receptor ID 263 to the Project site and the modeled received sound levels at the other receptors.

SOURCE: Tetra Tech EC, Inc., 2011.

measured to average 36 dBA L_{eq} during nighttime hours (see Table 3.12-1). It is unlikely that the solar plant would be audible at the nearest residence locations.

On-Site Maintenance Activities

Implementation of the Project would require approximately 20 permanent employees that would work at the solar plant site. The employees would inspect components of the solar farm, perform preventive maintenance, and conduct PV panel washing twice a year. In addition, some amount of unscheduled maintenance and repair would likely be necessary. These maintenance-related activities would not be expected to be audible at the nearest sensitive receptor locations.

Off-Site Commuting Employee Traffic

Traffic associated with operation and maintenance activities generally would relate to the 20 workers traveling to and from the solar plant site each day. In addition, it is estimated that approximately four daily truck deliveries to the solar plant site would be required. This would result in a total of 48 additional daily trips (24 roundtrips) on the local roadways and highways, which do not occur under existing conditions. The addition of these trips on local roadways would not result in a perceivable increase in average ambient noise levels at sensitive receptor locations.

Gen-Tie Line Corona Noise

The term corona is used to describe the breakdown of air into charged particles caused by the electrical field at the surface of a conductor. Audible noise levels generated by corona discharge vary depending on weather conditions as well as the voltage and condition of the line. Wet weather conditions often increase corona discharge due to accumulation of raindrops, fog, frost, or condensation on the conductor surface, which causes surface irregularities thereby promoting corona discharge. Corona noise levels for a transmission line with similar voltage (220 kV) as the proposed 230 kV gen-tie line have been estimated to be approximately 30 dBA at the edge of the transmission line ROW during dry conditions (CPUC, 2010). During adverse weather conditions such as fog or rain, which are rare in the study area, corona discharge could be up to 20 dBA higher than in dry conditions. Therefore, under worst-case conditions, corona noise could be as high as 50 dBA at the edge of the proposed gen-tie line ROW.

The nearest residence along the proposed gen-tie line route is at a distance of approximately 0.6 mile. Assuming a maximum noise level of 50 dBA at the edge of the ROW during wet weather conditions and accounting for how noise levels from line sources attenuate over soft surfaces, maximum corona noise at the nearest residence could be as high as 32 dBA L_{eq} or 38 dBA L_{dn}. Therefore, corona noise levels that would be associated with the proposed gen-tie line would not conflict with USEPA noise guidelines for residences (i.e., 55 dBA L_{dn}). In addition, Project-related corona noise levels would be expected to be below ambient levels at the nearest residences, which have been measured to average 36 dBA L_{eq} during nighttime hours (see Table 3.12-1).

Vibration

Operation and maintenance of the Project would not introduce any new sources of perceivable groundborne vibration to the study area. Consequently, the Project would cause no operation- or maintenance-related adverse effects associated with groundborne vibration. Because implementation of the Project would not result in exposure of persons to or generation of excessive groundborne vibration, it also would not expose them to or generate excessive groundborne noise levels.

Decommissioning

At the end of the 30-year term of the BLM ROW grant, Project operation would cease and associated facilities would be decommissioned and dismantled, and the site would be restored over a period of approximately 24 months. Decommissioning activities could generate temporary noise levels similar to those that would occur during construction of the Project (i.e., up to approximately 46 dBA at the closest residence). On-site and off-site short-term decommissioning-related noise levels would result in noise levels at the nearest sensitive receptor locations that would be substantially less than 80 dBA L_{eq}.

Temporary sources of groundborne vibration and noise during decommissioning would result from operation of conventional heavy construction equipment, which can generate vibration levels of up to 0.09 in/sec at a distance of 25 feet (Caltrans, 2004). However, vibration levels attenuate rapidly from the source. At a distance of 0.6 mile, which is the approximate distance between the closest residences and any of the Project components involving active heavy construction equipment, vibration would not be perceivable.

Groundborne noise is the rumbling sound of structure surfaces caused by high vibration levels. Because construction and decommissioning of the Project would not result in exposure of persons to or generation of excessive groundborne vibration, it also would not expose them to or generate excessive groundborne noise levels.

4.12.4 Alternative 2: Reduced Acreage

Construction

Construction of Alternative 2 would occur over a period of approximately 24 consecutive months. The closest sensitive receptor to the Alternative 2 solar plant is a residence, approximately 2.9 miles to the south-southeast. Based on the construction equipment composite noise levels that assume all of the equipment would operate simultaneously at maximum load usage (see Table 4.12-1) maximum noise levels from construction activities that could occur at the Alternative 2 solar plant site would be approximately 31 dBA at the closest identified residence, which would be approximately 2 dBA less than the maximum noise level that would occur at the nearest residence to the Project solar plant site. All other construction noise and vibration levels that would be associated with Alternative 2 (e.g., construction of the gen-tie and access road, construction related traffic, groundborne vibration, etc.) would be the same as under the Proposed Action; however, all construction-related noise and vibration levels would cease at the end of the 24-month construction period, which would be 22 months less than the construction period that would occur under the Proposed Action. On-site and off-site short-term noise under Alternative 2 would result in noise levels at the nearest sensitive receptor locations that would be substantially less than 80 dBA L_{eq}.

Temporary sources of groundborne vibration during construction of Alternative 2 would not be perceivable.

Operation and Maintenance

As described above, the closest sensitive receptor to the Alternative 2 solar plant is a residence, approximately 2.9 miles to the south-southeast, which is approximately the same distance from Receptor ID 11 to the Proposed Action solar plant site. Therefore, it is assumed that the modeled received solar plant sound level at Receptor ID 11 under the Proposed Action (i.e., 13 dBA) would be the same as the received sound level at the closest sensitive receptor to the Alternative 2 solar plant site (see Table 4.12-1), which would approximately 1 dBA less than the received sound level at the closest sensitive receptor under the Proposed Action. The Alternative 2 solar power plant site would operate well within USEPA noise guidelines at all existing residences. In addition, noise levels associated with the solar power plant would be well below ambient conditions at the nearest sensitive receptors, measured to average 36 dBA L_{eq} during nighttime hours (see Table 3.12-1). It is unlikely that the solar plant under Alternative 2 would be audible at the nearest residence locations.

All other operation and maintenance noise and vibration levels that would be associated with Alternative 2 (i.e., on-site maintenance, off-site commuting of employee traffic, gen-tie line corona noise, and groundborne vibration) would be the same as under the Proposed Action.

Decommissioning

Decommissioning activities under Alternative 2 could generate temporary noise and vibration levels similar to those that would occur during construction of Alternative 2.

4.12.5 Alternative 3: Reconfigured Gen-tie/Access Road Routes

4.12.5.1 Central Route

Construction

The distance to the closest sensitive receptor (i.e., a residence) to the portion of the Central Route that varies from the proposed gen-tie line route would be approximately 0.4 mile (2,100 feet). This would be a shorter distance to a residence compared to the portion of the Proposed Action gen-tie line that varies from the Central Route, which would be approximately 0.8 mile (4,200 feet) from a residence. Based on the construction equipment composite noise levels that assume all of the equipment would operate simultaneously at maximum load usage (see Table 4.12-1), maximum noise levels at the closest residence that would be associated with construction activities of the Central Route would be 51 dBA, which would approximately 8 dBA higher than the maximum noise level that would occur at the same residence under the Proposed Action. All other construction noise levels that would be associated with the Central Route (e.g., construction related traffic, etc.) would be the same as under the Proposed Action. Although vibration levels may be slightly elevated due to construction of the Central Route compared to under the Proposed Action, they would still be inaudible.

On-site and off-site short-term noise would result in noise levels at the nearest sensitive receptor locations that would be substantially less than 80 dBA L_{eq}.

Temporary sources of groundborne vibration during construction of the Central Route would not be perceivable.

Operation and Maintenance

As described above, the distance to the closest sensitive receptor (i.e., a residence) to the portion of the Central Route that varies from the proposed gen-tie line route would be approximately 0.4 mile (2,100 feet), which would be approximately half the distance to a residence compared to the portion of the Proposed Action gen-tie line that varies from the Central Route. Based on the conservative assumption that corona noise could be as high as 50 dBA at the edge of the proposed gen-tie line ROW (CPUC, 2010), corona noise from the Central Route could be as high as 35 dBA L_{eq} or 41 dBA L_{dn}, which would be approximately 3 dBA higher than the maximum noise level that would occur at the same residence under the Proposed Action. However, Central Route corona noise would not conflict with USEPA noise guidelines for residences (i.e., 55 dBA L_{dn}). In addition, corona noise levels associated with the Central Route would be expected to be below ambient levels at the nearest residence, which has been measured to average 36 dBA L_{eq} during nighttime hours (see Table 3.12-1). Corona noise levels that would be associated with the Central Route gen-tie line would have a negligible effect on nearby residences.

All other operation and maintenance noise and vibration levels that would be associated with the Central Route (e.g., maintenance, etc.) would be the same as under the Proposed Action .

Decommissioning

Decommissioning activities that would be associated with the Central Route could generate temporary noise and vibration levels similar to those that would occur during construction of the Central Route.

4.12.5.2 Western Route

Construction

The distance to the closest sensitive receptor (i.e., a residence) to the portion of the Western Route that varies from the proposed gen-tie line route would be approximately 0.5 mile (2,600 feet). This would be a shorter distance to a residence compared to the portion of the Proposed Action gen-tie line that varies from the Western Route, which would be approximately 0.8 mile (4,200 feet) from a residence. Based on the construction equipment composite noise levels that assume all of the equipment would operate simultaneously at maximum load usage (see Table 4.12-1), maximum noise levels at the closest residence that would be associated with construction activities of the Western Route would be 48 dBA, which would approximately 5 dBA higher than the maximum noise level that would occur at the same residence under the Proposed Action. All other construction noise levels that would be associated with the Western Route (e.g., construction related traffic, etc.) would be the same as under the Proposed Action. Although vibration levels may be slightly elevated due to construction of the Western Route compared to under the Proposed Action, they would still be inaudible. On-site and off-site short-term noise would result in noise levels at the nearest sensitive receptor locations that would be substantially less than 80 dBA L_{eq}.

Temporary sources of groundborne vibration during construction of the Western Route would not be perceivable.

Operation and Maintenance

As described above, the distance to the closest sensitive receptor (i.e., a residence) to the portion of the Western Route that varies from the proposed gen-tie line route would be approximately 0.5 mile (2,600 feet), which would be approximately 1,200 feet closer to a residence compared to the portion of the Proposed Action gen-tie line that varies from the Western Route. Based on the conservative assumption that corona noise could be as high as 50 dBA at the edge of the proposed gen-tie line ROW (CPUC, 2010), corona noise from the Western Route could be as high as

33 dBA L_{eq} or 39 dBA L_{dn}, which would be approximately 1 dBA higher than the maximum noise level that would occur at the same residence under the Proposed Action. However, Western Route corona noise would not conflict with USEPA noise guidelines for residences (i.e., 55 dBA L_{dn}). In addition, corona noise levels associated with the Western Route would be expected to be below ambient levels at the nearest residence, which has been measured to average 36 dBA L_{eq} during nighttime hours (see Table 3.12-1).

All other operation and maintenance noise and vibration levels that would be associated with the Western Route (e.g., maintenance, etc.) would be the same as under the Proposed Action .

Decommissioning

Decommissioning activities that would be associated with the Western Route could generate temporary noise and vibration levels similar to those that would occur during construction of the Western Route.

4.12.6 Alternative 4: No Action Alternative

Under the No Action Alternative, noise and vibration levels in the vicinity of the Project site would not be expected to change noticeably from existing conditions.

4.12.7 Cumulative Impacts

Noise levels tend to diminish quickly with distance from a source; therefore, the geographic scope for cumulative impacts associated with noise would be limited to projects located within approximately 0.5 mile of the Project. The temporal scope for cumulative impacts associated with noise would include the construction, operation, maintenance, and decommissioning phases of the Project.

Project construction and decommissioning activities would result in short-term noise impacts at the nearest residence locations, and long-term operation- and maintenance-related impacts associated with the Project would result in permanent noise sources. The Project would have no vibration- or groundborne noise-related impacts.

There are several projects within 0.5 mile of the Project that are reasonably foreseeable and could be constructed and operated simultaneously with the Project. These projects include the enXco McCoy solar project, the BSPP, the Colorado River Substation Expansion project, CUP03602 PV solar project, and the Palo Verde 2 concentrated solar power project. It is possible that construction and operation of these solar projects and the substation expansion project could occur at the same time as construction of the Project. However, except for the BSPP, the other cumulative projects would be at similar or greater distances from the existing sensitive receptor locations that would experience negligible noise levels from construction, operation, maintenance, and decommissioning of the Project. Therefore, it is unlikely that Project-related noise levels and other project noise levels would result in a combined noise level that would cause an adverse effect.

The BSPP is proposed to be closer to the residences that would experience some noise from the Project. The PA/FEIS for the BSPP identified the highest noise level at the closest residence would be 61 dBA L_{eq} during construction and decommissioning, and 40 dBA L_{eq} during operation and maintenance. The noise levels at the same residence under the Project would be up to 33 dBA L_{eq} during construction and decommissioning and 13 dBA L_{eq} during operation and maintenance. Adding the Project noise levels to the BSPP noise levels would not result in an adverse cumulative noise increase.

4.12.8 Mitigation Measures

None recommended.

4.12.9 Residual Impacts after Mitigation Incorporated

There would be no residual adverse impacts after mitigation has been incorporated.

4.13 Paleontological Resources

4.13.1 Methodology for Analysis

This analysis of potential effects of the Proposed Action and Alternatives on paleontological resources is based on a review of relevant literature and site-specific information provided by the Applicant. A paleontological literature and records search was conducted by the Vertebrate Paleontology Section of the LACM and the Department of Earth Sciences at the San Bernardino County Museum. The results of the literature and records search and the paleontological resources survey are presented in the following report:

SWCA, 2011. Paleontological Resources Assessment for the McCoy Solar Energy Project, Riverside County, California.

The information was used to assign geologic units within the area to a PFYC class, in accordance with BLM protocol. The study area for the analysis of potential effects of the Proposed Action and alternatives on paleontological resources includes the zone of expected surface disturbance and the stratigraphic context in which fossils are located.

Surface disturbing actions have the potential to impact surface and subsurface paleontological resources in rock units and overlying sediments known to contain such resources. Direct impacts include destruction due to breakage and fragmentation and loss of context in the stratigraphic record; indirect impacts may result from increased accessibility to paleontological resources resulting in an increased likelihood of looting or vandalism. Cumulative impacts could result from the Project in combination with other past, present, or reasonably foreseeable future projects' incremental contributions to impacts on paleontological resources located in Holocene alluvium, Pleistocene alluvium, and dry desert washes throughout eastern Riverside County. All impacts would result in a permanent loss of scientific information that might otherwise have been gained through preservation, recovery, and/or salvage of fossil resources.

4.13.2 Applicant Proposed Measures

The following APMs have been developed to reduce the potential adverse impacts on paleontological resources.

Paleo-1. To address potential paleontological impacts during the pre-construction phase:

a) Prior to the start of any Project-related construction (defined as construction-related vegetation clearing, ground disturbance and preparation, and site excavation activities), the project owner shall ensure that a qualified paleontologist is available for field activities and is prepared to implement the conditions of approval. The qualified paleontologist shall be responsible for implementing all the paleontological conditions of approval and for using qualified personnel to assist in this work.

b) Prior to the start of construction, the qualified paleontologist shall prepare a worker's environmental awareness training program. The paleontological training program shall address the potential to encounter paleontological resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources. The training program shall also include the set of reporting procedures that workers are to follow if paleontological resources are encountered during Project activities. The training program shall be presented by a qualified paleontologist and may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.

Paleo-2. To address potential paleontological impacts during the construction phase:

a) The qualified paleontologist or paleontological monitor shall be present at all times he or she deems appropriate to monitor construction-related grading, excavation, trenching, and/or augering in areas with a significant potential for fossil-bearing sediments to occur. All ground-disturbing activities in areas determined to have a high sensitivity shall be monitored on a full-time basis at the start of the Project. All ground disturbances in areas determined to have low to high sensitivity at depths of 1.5 m (5 feet) or greater shall also require monitoring on a full-time basis, initially. If no significant fossils are found, then the frequency of monitoring shall be adjusted at the discretion of the qualified paleontologist after an adequate amount of time is spent observing the geologic deposits in the project area. No monitoring is required in areas determined to have a low sensitivity.

b) Paleontological monitoring will include inspection of exposed rock units and collection of matrix to be tested for the presence of microscopic fossils. Paleontological monitors will have authority to temporarily divert excavations or drilling away from exposed fossils in order to efficiently and professionally recover the fossil specimens and collect associated data. Any paleontological fieldwork occurring on lands administered by the BLM would require a Paleontological Resources Use Permit issued by the BLM state office.

Paleo-3. To address potential paleontological impacts during the post- construction phase:

The Project owner shall ensure preparation of a paleontological resources monitoring report by the qualified paleontologist. The report shall be completed following the analysis of any recovered fossil materials and related information. The report shall include, but not be limited to, a description and inventory list of recovered fossil materials (if any); a map showing the location of paleontological resources found in the field; determinations of scientific significance; and a statement by the qualified paleontologist that project impacts to paleontological resources have been mitigated.

4.13.3 Alternative 1: Proposed Action

4.13.3.1 Direct and Indirect Impacts

Construction

Project construction would include the following earth disturbing activities: 1) grading of access roads, the gen-tie line, building foundations, parking areas, and the solar plant site substations; 2) foundation excavation for concrete tower structures and various facilities; 3) trenching for conduit and a telecommunication line; and 4) steel pile installation for the solar trackers. These activities are expected to result in the disturbance of approximately 4,487 acres of land (some of the area within the Unit 2 fence would remain undisturbed). No significant paleontological resources were identified within the Project site during the course of the field survey. However, based on the geological setting, the museum records search, and PFYC criteria, the site is underlain either at the surface or within shallow depths by a Class 3(a) geologic unit (i.e., Pleistocene alluvium). Because Pleistocene alluvium is mapped at the surface within the western portion of the proposed solar field site and various portions of the gen-tie line, shallow excavations have the potential to disturb yet unknown or undiscovered but potentially significant fossil resources. Younger alluvium, eolian sand, and modern wash deposits, which predominantly underlie the eastern part of the solar plant site, and portions of the gen-tie line, are units with a PFYC of Class 2. However, because these units are frequently underlain by older sedimentary deposits at undetermined but potentially shallow depths, deeper excavations exceeding 5 feet within these areas also could uncover yet unknown undiscovered but potentially significant fossil resources.

In order to address this issue, the Applicant has proposed APMs Paleo-1 through Paleo-3, which are to be implemented as part of the Project, and which would reduce impacts to sensitive paleontological resources throughout the Project site. These APMs are described in Section 4.13.2 and would: 1) require a worker environmental training program to be established and administered by a qualified paleontologist prior to the start of construction; 2) ensure that the qualified paleontologist is present for all earth disturbing work in sensitive paleontological areas (geologic units with PFYC Class 3(a)); and 3) ensure a paleontological monitoring report is completed by the qualified paleontologist at the end of construction that summarizes all Project construction-related impacts to paleontological resources. These measures would effectively identify fossil resources in the field during construction, and would ensure that their status is evaluated by qualified personnel, recorded, and recovered if appropriate. Implementation of the Project and associated APMs would result in the avoidance or substantial reduction of adverse impacts to paleontological resources. Should unique fossil resources be salvaged during Project-related grading and construction, implementation of the APMs would result in an improved scientific understanding of the natural history and geology of the area that would not have been gained otherwise.

One caveat of the aforementioned APMs is that they may not be sufficient to completely avoid or eliminate potential impacts on paleontological resources resulting from the use of invasive construction methods such as vehicle-mounted power augers or blasting. Power augers may be used for steel pile installations along the gen-tie line and for the solar trackers and, if geologic conditions warrant, blasting might be used to loosen soil and rock that are a challenge to excavate. As opposed to soil excavations using backhoes, use of power augers or blasting means that site workers and/or paleontological monitors may be unable to identify fossil resources prior to their disturbance or destruction. While intact fossils still may be found in drill cuttings, and fossils damaged by excavation equipment can sometimes be repaired in a laboratory, the nature of some of the construction methods to be used on-site means that implementation of the APMs may be unable to avoid impacts on paleontological resources.

Given that 1) the APMs include multiple measures to avoid damage to fossil resources, including active monitoring, 2) much of the Project-related excavations would utilize backhoes, and 3) the value of paleontological resources is predicated on their discovery within a specific geologic host unit, construction of the Project could result in a net gain to the science of paleontology by allowing fossils that would not otherwise have been found to be identified, studied, and if appropriate, recovered and preserved.

Operation and Maintenance

Operation and maintenance of the Project would not impact paleontological resources because no earth disturbance would occur as a result of these activities.

Decommissioning

Decommissioning and closure of the Project site would not impact paleontological resources. The ground disturbed during these activities already would have been disturbed during construction and subjected to the APMs identified in Section 4.13.2.

4.13.4 Alternative 2: Reduced Acreage

Alternative 2 would cause the same type of paleontological resource-related impacts (beneficial and adverse) as the Proposed Action. However, because the solar plant site would be smaller for Alternative 2 than for the Proposed Action, construction activities would affect a smaller area and, thereby, affect fewer locations where paleontological resources may be found. For the same reasons as for the Proposed Action, Alternative 2 would cause no impact to paleontological resources during operation, maintenance, or decommissioning.

4.13.5 Alternative 3: Reconfigured Gen-tie/Access Road Routes

4.13.5.1 Central Route

The Central Route would cause the same types of paleontological resource-related impacts as the Proposed Action, although the location of the impacts associated with the proposed gen-tie route would be shifted to the west relative to the Proposed Action. The Central Route would be incrementally shorter than the proposed gen-tie and access road route, and so its construction would affect a slightly smaller area within which potential paleontological resources could be found. Nonetheless, there would be no substantial difference between the Central Route and the Proposed Action.

4.13.5.2 Western Route

The Western Route would cause the same types of paleontological resource-related impacts as the Proposed Action. The Western Route would be incrementally longer than the proposed gen-tie and access road route, and so its construction would affect a slightly larger area within which potential paleontological resources could be found. Nonetheless, there would be no substantial difference between the Western Route and the Proposed Action.

4.13.6 Alternative 4: No Action Alternative

Under the No Action Alternative, soils underlying the Project site would remain subject to the existing level of disturbance, resulting in no change relative to baseline conditions. Alternative 4 would cause no adverse impact to paleontological resources. However, the potential benefits associated with the discovery, study and preservation of paleontological resources that could occur as a result of the Project would not be realized.

4.13.7 Cumulative Impacts

All projects in the cumulative scenario that would be located on the same geologic units within eastern Riverside County, including Holocene alluvium, Pleistocene alluvium, and dry desert washes, are considered within the geographic scope of analysis with respect to cumulative impacts on paleontological resources. This is because the ground disturbance caused by individual projects in the cumulative scenario, if not properly mitigated, could combine to cause a cumulative loss of scientific information through disturbance or destruction of potentially significant fossil resources. Since these geologic units are ubiquitous across the interior drainage basins of the desert region, all projects listed in Tables 4.1-3 and 4.1-4 could cause impacts that may combine. As described in Section 3.11, *Mineral Resources*, approximately 1,544,000 acres within eastern Riverside County are underlain by the same geologic units that would be disturbed by the Project. In combination, all projects in the cumulative scenario total 316,675 acres, representing as much as 21 percent of the geographic scope of the cumulative analysis. Projects in the cumulative scenario could affect paleontological resources regardless of their timing.

Cumulative conditions related to paleontological resources involve the loss of non-recoverable scientifically important fossils and associated data, and the incremental loss to science and society of these resources over time. Energy development projects have resulted in cumulative conditions affecting paleontological resources in eastern Riverside County. However, the implementation of protective measures such as the APMs that would be implemented as part of the MSEP and mitigation measures designed to protect paleontological resources during surface disturbing projects has resulted in the salvage and permanent preservation of scientifically significant resources that otherwise would have been destroyed or remain undiscovered. This has substantially reduced the cumulative effects of such projects on paleontological resources, and has resulted in the beneficial cumulative effect of making these fossils available for scientific research and education by placing them in museum collections.

Excavation activities associated with the Project in conjunction with other projects in the area could contribute to the progressive loss of sensitive paleontological resources. However, with incorporation of APMs Paleo-1, Paleo-2 and Paleo-3, the Project would either avoid nearly all impacts to fossil resources, or result in the recovery of scientific data should previously unrecorded fossils of significance be uncovered. Nonetheless, some fossil disturbance could be associated with Project-related installation of steel pile foundations, inadvertent damage caused by excavation equipment, or the failure of paleontological monitors to identify fossils. These incremental impacts of the Project could combine with the adverse impacts of other projects in the cumulative scenario; however, they would very minor and would not outweigh the potentially positive impacts associated with the potential for the Project's recovery of fossils that would be of value to the scientific community.

4.13.8 Mitigation Measures

None recommended.

4.13.9 Residual Impacts after Mitigation Incorporated

Because no mitigation measures are recommended, impacts to paleontological resources would be the same as discussed in Section 4.13.3, *Alternative 1: Proposed Action*.

4.14 Recreation and Public Access (Off-Highway Vehicles)

4.14.1 Methodology for Analysis

This section analyzes potential effects of the Proposed Action and Alternatives related to recreation and OHV use. This analysis of potential effects on recreation assesses the impacts to land acreage as well as types of known recreational uses including hiking, backpacking and long-term camping in established federal, state, or local recreation areas and/or wilderness areas. The CDCA Plan recognizes that the California Desert is "a reservoir of open space and as a place for outdoor recreation." (BLM, 1980, p. 69). The CDCA Plan notes that the diverse landscape of the California desert provides for a variety of physical settings. Further, the CDCA Plan identifies the wide variety of desert recreation uses, ranging from off-road vehicles to outdoor preservationists, and the increasing challenge to accommodate these varied and sometimes competing uses. For example, LTVA visitors typically enjoy backcountry vehicle touring on routes and washes and in the surrounding areas and would therefore be affected by the closures of open vehicle routes in the vicinity of the Project. The CDCA Plan and NECO Plan Amendment, which includes a detailed inventory and designation of open routes in the vicinity of the Project, were reviewed to determine impacts to open routes.

4.14.2 Applicant Proposed Measures

There are no APMs to address potential effects to recreation and public access.

4.14.3 Alternative 1: Proposed Action

4.14.3.1 Direct and Indirect Impacts

OHVs

Construction and Decommissioning

During the construction phase, construction of the gen-tie line and access road route would traverse several designated OHV routes and would require short-term closures or access limitations to portions of the following OHV routes: 660637, 660703, 660709, 660712, 660835, 660857, 660858, 660860, 661085, and 661089.

Mitigation Measure REC-1 would reduce temporary, construction-related recreation impacts by requiring that the Applicant post interpretative materials about the Project at nearby LTVAs, campgrounds, and BLM kiosks. This material would include construction schedules and safety information regarding trucks and other heavy equipment use on local roads. In addition, Mitigation Measure REC-2 would require the Applicant to coordinate construction activities with the AO for nearby recreation areas and schedule construction to avoid heavy recreational use periods. Construction equipment would also be required to be located in areas that would avoid temporary closure of or preclusion of access to recreation areas. Mitigation Measure REC-3 would reduce construction-related impacts to public access by requiring that the Applicant coordinate any temporary closure of any NECO Plan-designated open routes with the AO if the route is deemed unsafe to use during construction. The Applicant would be required to post a public notice of the temporary route closure.

Operation and Maintenance

The Project site is traversed by one major designated OHV route, No. 661085, which is a north/south link between I-10 and Arlington Mine Road to the north of the Project site. It also provides access to lands identified as having wilderness characteristics. This route provides access for both street-legal and non-licensed OHVs that are not permitted to travel on the paved county-maintained Midland Road. Closure of the approximately 2 miles of this route within the Project site during the operation and maintenance phase of the Project would impact the ability of OHVs to travel in this area and would additionally eliminate a link that forms a looped route around the east and west sides of the Palen-McCoy and the Rice Valley Wilderness, respectively. Approximately 1.3 miles of route No. 660835, near the eastern boundary of the solar plant site, would also be closed. This route is not considered by the BLM to be as recreationally significant as route No. 661085. There are a number of other alternative routes that provide access to OHV routes from the I-10 corridor so overall access for wilderness and recreation would not be impacted. According to the BLM Rangers from the PSSCFO, OHV use in and around the Project site is minimal with not more than, conservatively, a few hundred visits in a year during the cool months (September through May). In general, sightseeing and day use touring by locals is the predominant use pattern on the affected routes.

Mitigation Measure REC-5 would reduce the public access impact by requiring that the Applicant, in consultation with the BLM, reestablish north/south OHV connectivity to the northeast side of the Palen-McCoy Wilderness Area and the west side of the Big Maria Wilderness Areas. Mitigation Measure REC-6 would reduce the long-term effects on recreational access by requiring the Applicant to identify and provide alternative recreational opportunities and experiences on the lands outside the Project site boundary.

After decommissioning, recreational users would experience a beneficial impact as the site would be restored to its natural undeveloped state and it would be available for recreational use. Public access to OHV routes would also be restored.

All Phases

For all phases of the Project, activity at the site and installation of a new industrial feature could attract OHV users in the surrounding viewshed to the site boundary via designated OHV open routes or over land. This could increase the opportunities for vandalism, illegal cross-country use, and other disruptive behavior. Mitigation Measure REC-3 would reduce this potential effect by requiring notification of penalties for any off-route OHV activities to deter off-route travel.

Recreational Use

On-Site

Construction, Operation, Maintenance and Decommissioning. According to the Recreation Element of the CDCA Plan, "lands managed by the Bureau [BLM] are especially significant to recreationists." Permanent conversion of approximately 3,960 acres of public lands within the solar plant site, including 1,089 acres of lands determined to have wilderness characteristics, to the Project would disrupt dispersed recreational activities. The solar plant site would be inaccessible for recreational use (with the exception of the Unit 1 construction phase, during which only the Unit 1 site would be fenced/inaccessible). Access roads would have gates or signs installed to control public access to the site for safety reasons. Although day users, hikers, and RV campers would no longer be able to utilize the Project site for dispersed recreational opportunities and related experiences and benefits during construction, operation, maintenance, and decommissioning, dispersed recreational use has not been observed within the Project area by BLM Rangers.

As an indirect effect of the Project, campers, hikers, and backpackers could compensate for the loss of these public lands by utilizing other desert lands in the vicinity of the Project for their recreational experiences and benefits. This could result in more concentrated use of those areas, leading to loss of some native vegetation, wildlife habitat fragmentation or loss, elevated soil loss, increases in noise, and possible temporary declines in air quality from more concentrated vehicle use in a smaller available area. However, this impact would be minimal because, as discussed above, high recreational use has not been observed within the Project area by the BLM Rangers.

Off-Site

Special Designations. Effects to recreational users of specially designated lands (including, wilderness, ACECs, and LTVAs) could occur. For a discussion of potential impacts to OHV route access to wilderness areas, see above. For a discussion of the potential impacts to visual quality from wilderness areas and ACECs see Section 4.19, *Visual Resources*.

Six wilderness areas are located in the vicinity of the site: the Palen-McCoy Wilderness, Big Maria Mountains Wilderness, Rice Valley Wilderness, Little Chuckwalla Mountains Wilderness, Palo Verde Mountains Wilderness, and Riverside Mountains Wilderness. The Palen-McCoy Wilderness is the closest to the Project site at approximately 1.8 miles to the east. Recreational users could be affected by construction, operation, maintenance, and decommissioning activities that would generate noise and dust. However, according to the CDPA §103(d), "The Congress does not intend for the designation of wilderness areas in §102 of this title to lead to the creation of protective perimeters or buffer zones around any such wilderness area. The fact that nonwilderness activities or uses can be seen or heard from areas within a wilderness area shall not, of itself, preclude such activities or uses up to the boundary of the wilderness area."

However, as discussed in Section 4.12, *Noise*, the loudest noise associated with the Project would be encountered during Phase 2 of Project construction. Ambient noise levels measured at a residence located approximately 2.7 miles south of the southern Project boundary in June 2009 found average daytime noise levels to be 45 dBA L_{eq} and average nighttime noise levels to be 36 dBA L_{eq}. The maximum noise levels from construction activities that could occur at the solar plant site would be approximately 33 dBA at the closest identified residence located 2.6 miles away. Considering that the nearest special designation where recreational use would occur is approximately 2 miles to the east of the Project boundary, noise would attenuate such that the sound would be barely audible to recreational users. Therefore, impacts to recreational users of wilderness areas would be minimal. However, impacts to recreational users of lands with wilderness characteristics within approximately 2 miles of the northeastern fence line would be affected temporarily during construction activities. As discussed above, campers, hikers, and backpackers could compensate by utilizing other desert lands in the vicinity of the Project for their recreational experiences and benefits.

As discussed in Section 4.2, *Air Resources*, construction, operation, maintenance, and decommissioning activities could generate dust in the form of PM10 and PM2.5. However, the worst-case PM2.5 and PM10 impacts would occur at the fence line and drop off quickly with distance. Therefore, there would be no impacts to recreational users within special designation areas and minor temporary impacts to recreational users of lands with wilderness characteristics within close proximity to the Project fence line.

Long Term Visitor Areas. The Midland LTVA is located about 4.6 miles northeast of the Project site. Visitors camping at this LTVA are seeking opportunities for socialization with similar users in a semi-primitive environment. Due to the distance from the Project site there would be no impact to recreational users from noise and/or dust created by construction, operation, maintenance, and decommissioning activities. It is anticipated that some construction workers could reside in RV campers at the Mule Mountain and Midland LTVAs in California and the La Posa LTVA south of Quartzsite in Arizona, or possibly camp on public lands in the vicinity of the Project site during the construction phase of the Project. Although the BLM offers developed campgrounds within commuting distance of the Project, only the LTVAs allow long-term camping. The Midland and Mule Mountains LTVAs allow camping up to 7 months (September 14 to April 16) with a special use permit. Outside of these dates, the camping limit is 14 days. Depending on the number of authorized workers using the LTVA, use could affect the social setting or the physical infrastructure of the LTVAs. However, the LTVAs are designed with minimal facilities given that campers must use self-contained RVs and there are no assigned or designated sites, except for the Wiley’s Well and Coon Hollow Campgrounds within the Mule Mountain LTVA. Midland LTVA is 135 acres and averages 41 permits per year. Mule Mountain LTVA is 2,805 acres with an average of 135 permits per year. Except for the designated campsites at Wiley’s Well and Coon Hollow, each LTVA can accommodate several hundred RV units with a minimum distance of 15 feet between units, which is well in excess of current use.

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

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

The temporary increase in demand for accommodations during construction that might be caused by an influx of workers and the resulting potential impact on LTVAs and other nearby recreation areas would be reduced by Mitigation Measure REC-4, which encourages workers to utilize local housing opportunities or private RV parks in Blythe and other nearby communities instead of public lands.

Regional and Local Recreation Resources. Because the regional and local recreational facilities described in Section 3.14 consist primarily of long-term camping facilities and supporting recreational uses, impacts to these resources would be similar to impacts to LTVAs described above. Depending on the number of authorized workers using the long-term camping facilities, use could affect the social setting or the physical infrastructure of these sites and/or the availability of short-term recreational uses due to increased demand.

4.14.4 Alternative 2: Reduced Acreage

4.14.4.1 Direct and Indirect Impacts

Alternative 2 would cause the same types of recreation-related impacts as the Proposed Action, and would have the same direct effect on designated OHV routes. However, the solar plant site would be smaller for Alternative 2 than for the Proposed Action, making only 1,782 acres of public lands inaccessible within the solar plant boundary for recreational use beginning with construction and ending after decommissioning is complete. Additionally, during construction and decommissioning, Alternative 2 would have the same indirect effect on existing recreational resources, but during operation and maintenance this effect would be slightly reduced due to its fewer (13) long-term employees.

4.14.5 Alternative 3: Reconfigured Gen-tie/Access Road Routes

4.14.5.1 Central Route

Direct and Indirect Impacts

Because the Central Route would result in temporary closures of the same routes, and the workforces for all phases of this Alternative would be the same as the Proposed Action, the Central Route would have the same direct and indirect impacts on recreation and public access as the Proposed Action.

4.14.5.2 Western Route

Direct and Indirect Impacts

Because the Western Route would result in temporary closures of the same routes, and the workforces for all phases of this Alternative would be the same as the Proposed Action, the Western Route would have the same direct and indirect impacts on recreation and public access as the Proposed Action.

4.14.6 Alternative 4: No Action Alternative

The No Action Alternative would result in no recreation-related or public access impacts because the Project would not be implemented, and therefore, there would be no change to the existing use.

4.14.7 Cumulative Impacts

4.14.7.1 Recreational Use of Local and Regional Facilities

The geographic scope of the cumulative effects analysis for general recreation at local and regional facilities includes the local and regional recreational facilities described in Section 3.14.1.2. The temporal scope includes all phases of the Project, beginning with construction of the Unit 1 fence and ending after decommissioning. As described above, the Project's authorized workers could use the long-term camping facilities and their associated recreational amenities primarily during construction and decommissioning. The other projects in the cumulative scenario, and in particular the other renewable energy projects listed in Tables 4.1-3 and 4.1-4, could result in similar demand for and use of long-term camping and other recreational facilities. In combination, the increased use of these resources due to the presence of authorized workers for the Project and cumulative projects could affect the social setting or the physical infrastructure of these sites. Additionally, increased demand for other types of recreation resources and the displacement of dispersed recreation from the Project site and other projects' development footprints could reduce the availability of short-term recreational uses for other visitors to the area. However, the effects related to displacing dispersed recreation would be minor due to the low observed recreation on the Project site and at other projects' locations (e.g., BLM, 2010a, 2011).

4.14.7.2 Recreational Use of Public Lands

The geographic scope of the cumulative effects analysis for general recreation on public lands includes CDCA Plan area lands designated Class L in eastern Riverside County. This geographic scope was established based on the boundaries of the affected resource. The temporal scope includes all phases of the Project, beginning with construction of the Unit 1 fence and ending after decommissioning. As described in Section 3.10, *Lands and Realty*, there are 550,087 acres of Class L lands in eastern Riverside County. During this period, from start of construction to the completion of decommissioning activities, the existence of the Project would preclude the use of the site for recreation and, thereby, affect the amount of Class L lands within the CDCA Plan area available for recreational use. The Desert Southwest Transmission Line Project; enXco McCoy, BSPP, Palo Verde 2, and Rio Mesa renewable energy projects; and the Eagle Mountain Landfill Project would also be located on Class L lands. The Project would remove approximately 4,019 acres, and Alternative 2 would remove 1,782 acres plus 59 acres (if paired with the Eastern Route) or slightly less (if paired with the Central Route) of Class L lands from availability for recreational use.

The projects listed above and described in Table 4.1-4 would occupy over 40,000 acres of Class L lands in eastern Riverside County, for a total of approximately 44,000 and 42,000 acres including the Project's or Alternative 2's contribution. Of the total Class L lands in eastern Riverside County, the Project represents less than 1 percent with a total cumulative effect of approximately 8 percent. Alternative 2 represents less than 0.5 percent with a total cumulative effect of less than 8 percent. The contributions of the Alternative 3 gen-tie and access road routes would be negligible, with a difference of fewer than 10 acres compared to the proposed gen-tie line and access road route.

Over 500,000 acres of Class L lands in eastern Riverside County would remain available for recreational use, other classes of lands can also support some of the same recreational uses that are allowed on Class L lands, and upon completion of decommissioning these lands would be available for recreational use. Additionally, most of the projects in the cumulative scenario are located in areas with low recreation use, much like the Project site.

4.14.7.3 Lands with Wilderness Characteristics

The geographic scope of the cumulative effects analysis for effects on lands with wilderness characteristics would be an area of approximately 30,200 acres within the McCoy Wash that has been identified as lands with wilderness characteristics (Figure 4.1-1). Effects would occur throughout the life of the Project and beyond. As described in Section 4.16, *Special Designations*, the Project would convert approximately 1,089 acres of lands with wilderness characteristics to use as a solar plant. Implementation of the enXco McCoy Project, just north of the Project, could affect up to 7,150 acres of lands with wilderness characteristics. Therefore, a total of 8,240 acres or approximately 27 percent of the area identified as lands with wilderness characteristics would be unavailable for recreational use. The Project's incremental contribution to this cumulative impact would be approximately 13 percent of the total impact. Implementation of Mitigation Measure LWC-1 described in Section 4.16 could offset impacts specific to the Proposed Action through enhancement of off-site lands, providing a net benefit to a designated wilderness area that provides opportunities for recreational use.

4.14.7.4 Long-Term Visitor Areas

As described above, it is anticipated that some construction workers could reside in RV campers at the Mule Mountain and Midland LTVAs in California and the La Posa LTVA south of Quartzsite in Arizona; these LTVAs make up the geographic scope of this analysis. Each LTVA can accommodate several hundred RV units, and current use is much lower than capacity. Other Projects in the cumulative scenario would also result in an influx of construction workers who may choose to reside in LTVAs during the permitted season. Impacts to LTVAs from maximum authorized use by construction workers would be to the social and recreation experience of winter users, as well as to the potential need for increased law enforcement patrols, reducing the available patrols for other public lands. Implementation of mitigation measures REC-4 and REC-6 would reduce the Project's contribution to these impacts.

4.14.7.5 OHVs

The energy-related development projects identified in Table 4.1-1 would also result in the closure of OHV open routes in the California Desert. The closures would have an adverse effect on the viewscape that would result in some users seeking out, legally or illegally, other areas of the desert for their activities and experiences. Specifically, the closure of portions of major designated open route No. 661085 as a result of the BSPP to the south and enXco McCoy to the north of the Project site, in combination with closure of a segment of the same route on the Project site, would result in a total closure of approximately 6.5 miles. Other routes affected by the combined projects would result in the additional closure of approximately 6 miles of OHV open routes.

The effect of the overall cumulative past, present, and reasonably foreseeable projects in eastern Riverside County, in combination with the closure of OHV routes by the Proposed Action, would adversely affect OHV open routes through closures, rerouting, and use restrictions. However, decommissioning activities would ultimately restore OHV opportunities.

The Project's incremental contribution to temporary, construction-related impacts to OHV routes would be reduced through implementation of Mitigation Measure REC-3, which requires coordination of temporary closure of OHV routes during construction with the BLM. The Project's incremental contribution to cumulative operational impacts on OHV use from closure of route No. 661085 would be reduced through implementation of Mitigation Measure REC-5, which requires reestablishment of the north/south OHV connectivity to areas in the vicinity of the Palen-McCoy and Big Maria Wilderness areas. Additionally, through that project's Mitigation Measure BLM-OHV-2, BLM also required the BSPP applicant to reestablish this connectivity (BLM, 2010b). It is therefore reasonably foreseeable that the enXco McCoy project would be required to implement such a measure as well. These mitigation measures in combination would reestablish connectivity to the areas currently accessible by this route

4.14.8 Mitigation Measures

The following mitigation measures would be imposed by the BLM to avoid or reduce impacts on recreation and public access:

REC-1: The Applicant shall prepare and distribute interpretive materials, including a construction schedule and safety information regarding trucks and other heavy equipment on local roads, to users of the Midland, Mule Mountains, and La Posa LTVAs, Wiley's Well and Coon Hollow Campgrounds, and BLM kiosks announcing the development of the solar facilities at the Project site and the permanent closure of the affected public land to recreational use. The

Applicant shall prepare a one-page fact sheet about the Project and submit it to the PSSCFO for review. The BLM AO shall approve the draft materials prior to distribution.

REC-2: No less than 15 days prior to construction, the Applicant shall coordinate construction activities and the Project construction schedule with the AO for any recreation areas impacted. The Applicant shall schedule construction activities to avoid heavy recreational use periods, or special events in coordination with and at the discretion of the AO. The Applicant shall maintain open route access and avoid temporary preclusion of recreation in accordance with the recommendation of the AO. The Applicant shall document its coordination efforts with the AO prior to construction.

REC-3: No less than 60 days prior to construction, the Applicant shall coordinate with the AO administering any NECO Plan-designated open routes to establish temporary closure of the routes to avoid construction area hazards, if the route is deemed unsafe to use during construction. The Applicant shall post a public notice of the temporary route closure and penalties for any off-route OHV activities. The Applicant shall document its coordination efforts with the AO and submit this documentation to the BLM and other agencies affected at least 30 days prior to construction.

REC-4: The Applicant shall encourage Project workers to utilize local housing or private RV parks in Blythe and/or nearby communities.

REC-5: The BLM may require the Applicant to reestablish north/south OHV connectivity to the west side of the Big Maria Wilderness Area and to the northeast side of the Palen-McCoy Wilderness Area.[1] The Applicant may choose to allow continuous public access along the previously designed open route (Black Rock Road) while providing for separate site security to the solar facilities.

4.14.9 Residual Impacts after Mitigation Incorporated

Following implementation of mitigation measures provided in Section 4.14.8, all adverse impacts on recreation and OHV access resulting from construction, O&M, and decommissioning of the Project and alternatives would be avoided or substantially reduced.

[1] Implementation of a new route would require additional NEPA analysis as well as biological and cultural resources surveys as an agreed upon route has not been surveyed during this PA/EIS process.

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4.15 Social and Economic Effects

4.15.1 Methodology for Analysis

The CEQ's *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (40 CFR Parts 1500-1508; reprinted in CEQ, 2005) provides guidelines for addressing social and economic effects in preparing an environmental impact statement. Section 1508.14 of these regulations states that

> "Human environment" shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment. . . . This means that economic or social effects are not intended by themselves to require preparation of an environmental impact statement. When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment.

In §1508.8(b), the regulations state that indirect effects of an action "may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems."

Consistent with these regulations, the analysis of socioeconomic impacts will examine impacts of the Project and alternatives with respect to the following issues:

1. Housing availability and the character of local communities that may result from employment of workers for the construction, operation, and decommissioning;
2. Employment and economy of Riverside County from spending and employment; and
3. Revenues of the County government which would provide local public services.

The analysis of potential socioeconomic effects of the Proposed Action and alternatives takes place in the context of physical effects related to population and housing. An input-output model (IMPLAN) was used to estimate the indirect and induced economic impacts from construction operation, maintenance, and decommissioning of the MSEP.

4.15.2 Applicant Proposed Measures

There are no APMs to address potential social and economic effects.

4.15.3 Alternative 1: Proposed Action

4.15.3.1 Direct and Indirect Impacts

Construction

Housing and Community

Construction employment and spending for the Project is the primary mechanism by which the MSEP would cause a socioeconomic impact. Construction would be temporary and is expected to last for 46 months. Given the absence of existing significant economic uses of the site, Project construction would not displace any current economic activity. As discussed in Section 3.15, *Social and Economic Setting*, the location of construction workers is a key factor determining the extent of potential impacts to the local economy and communities. Income from employment primarily would benefit the communities in which the construction workers and their families reside because this is where most household expenditures occur. Also, the distance between workers' residences and the MSEP site would affect the choice of transportation and decision on whether to engage in "weekly commuting" or other forms of temporary relocation while working on the Project.

The number of construction workers on-site would range from 43 to 600 workers, with an average workforce of 341 workers. The estimated construction schedule shows that peak employment may occur in Year 3, Months 6 through 8, estimated to be August to October 2015. For purposes of this environmental analysis, a peak monthly employment of 750 workers is assumed, rather than 600.

Most construction workers are expected to come from western Riverside County, where, along with San Bernardino County, a substantial number of workers in relevant occupations reside (over 109,000 workers; Table 3.15-6). It is possible, however, that some workers will come from the Blythe area or La Paz County, Arizona.

With the exception of eastern Coachella Valley, most of western Riverside County is 2 hours or more travel time away from the Project site (see Figure 3.17-1). Since construction is a temporary assignment, it is not expected that workers from outside the Blythe area would relocate to Blythe permanently in order to work at the Project site. Data reviewed in Section 3.15.1 also indicate that some workers may engage in "weekly commuting," in which they find temporary or transient housing closer to the jobsite during the workweek. It is expected that such workers would seek temporary housing in the Blythe area, where both rental housing as well as a large number of hotel or motel rooms would be available.

According to the 2010 Census, there were 248 housing units for rent in the City of Blythe and an additional 81 units in the surrounding Blythe CCD (Palo Verde Valley and Mesa). There were also 47 units in the community of Ehrenberg and 78 in Quartzsite for a total of 454 rental units (Table 3.15-2). There were also 100 units for sale in the City of Blythe and 22 units in Ehrenberg. As indicated in Section 3.15, in 2008 a total of 296 vacant hotel and motel rooms were available for rent in the local study area. In addition, there are in Blythe and surrounding areas numerous RV facilities, mobile home sites, and campgrounds, which could provide alternative forms of temporary housing. Thus, there would be a sufficient supply of temporary housing options to accommodate workers who may seek temporary housing near the jobsite.

Regional Employment and Economy

With unemployment rates of 13.9 percent in Riverside County and 10.5 percent in La Paz County (averages for January to October 2011), employment of workers for Project construction would have a beneficial effect in helping to reduce unemployment.

Employment and resulting labor income also would have beneficial effects in Riverside County as a whole. These are estimated using a regional input-output model of Riverside County's economy (MIG, 2011). Starting with expenditures or employment for a given project, also called the *direct* impact, an input-output model represents major inter-industry (i.e., business-to-business) transactions in the region of interest, as well as transactions with households, government, and import/export with economies outside the region. Multipliers derived from the model can be used to estimate *indirect* impacts (business-to-business, or supplier, transactions following expenditures by a project) and *induced* impacts (expenditures by households of workers employed by the Project and by the chain of suppliers to the Project). The sum of direct, indirect, and induced impacts represents the total economic or employment impact to the region. For purposes of this analysis, Riverside County is the region of interest, since almost all workers are expected to come from the County.

Construction cost estimates for the MSEP have been developed based on the average construction workforce of 341 workers for the purpose of projecting impacts on regional employment, worker income, and the output of construction companies, excluding costs of materials and supplies that are installed during construction. These estimates are shown in Table 4.15-1.

TABLE 4.15-1
REGIONAL EMPLOYMENT AND INCOME IMPACTS FROM PROJECT CONSTRUCTION

Construction	Employment (Jobs)	Labor Income ($ Million)	Output ($ Million)
Direct Effect	324	$19.3	$45.0
Indirect Effect	57	4.1	11.1
Induced Effect	122	5.1	15.2
Total Effect	503	$28.5	$71.4

NOTE: Sector modeled is 36 Construction of Other New Nonresidential Structures.
Region is Riverside County. Income and output are in 2011 dollars.
Figures may not add to totals as shown due to rounding.

SOURCE: MIG, 2011

Of the average workforce of 341 workers, 95 percent, or 324 workers, would be anticipated to come from Riverside County. Their estimated combined income would be $19.3 million, and total output of the construction phase, excluding materials and supplies, is estimated to be $45.0 million. Including direct, indirect, and induced effects, total employment impact is estimated to be 503 workers in Riverside County; total income, $28.5 million; and total output, $71.4 million. These are annual effects during the 3.8 years of Project construction.

Riverside County Tax Revenues

The economic benefits of increased income and employment would result in indirect and induced revenue, and potential expenditures in the surrounding three counties; however, the precise distribution of labor force among these counties is not known. Because Riverside County would provide most of the local government services to the Project, such as police and fire protection, this analysis focuses on Riverside County.

During construction, the primary revenue source for the County would be the sales and use taxes levied on construction materials and supplies. The current sales tax rate applicable to unincorporated Riverside County is 7.75 percent, of which the County directly receives 1.5 percent, with 0.5 percent for the Riverside County Transportation Commission, 0.25 percent for county transportation funds, and 0.75 percent for county operations (California State Board of Equalization (BOE), 2011b). In addition, 0.5 percent is collected by the state for the Local Public Safety Fund to support local criminal justice activities.

Sales and use taxes are levied on materials and supplies used for construction in the jurisdiction where the jobsite is located (BOE, 2011d). For the Project, the principal materials subject to these taxes would be components of the solar energy generating system, including PV modules or panels, mounting and tracking systems, inverters, and other materials. Based on data collected by National Renewable Energy Laboratory (NREL, 2011), these components are estimated to cost $3.04 per watt (DC). Assuming an average efficiency of 85 percent for conversion to AC power, the effective price is $3.57 per watt (AC).

The NREL cost estimate includes $1.95 per watt (DC) for solar PV modules, the most expensive component of the energy generating system. A recent report (*The Washington Post*, 2011) indicates that some imported PV modules are selling at $1 per watt or less. Assuming that prices of components other than PV modules have not changed much since NREL's report, average material cost may currently (December 2011) be in the neighborhood of $2.09 per watt (DC), or $2.46 per watt (AC), indicating a total material cost of around $1.84 billion for a 750 MW facility. Sales tax revenues allocated to the County (1.5 percent), excluding the Local Public Safety Fund, then would be $27.6 million.

The BOE generally distributes sales and use tax revenues from construction materials and supplies to local governments through a countywide pool, unless a special procedure is used to allocate all such revenues to the jurisdiction of the jobsite. Under the Countywide pool, the unincorporated County would receive a percentage of the revenues, which varies by quarter according to sales and use taxes collected. In the third quarter of 2011, the County received 10.9 percent of the countywide pool (BOE, 2011c). Under such an allocation, the County would receive about $3.0 million in sales tax revenues from construction materials.

Operation and Maintenance

Housing and Community

Permanent operating staff for the Project would number approximately 20 workers. In contrast to construction employment, it is expected that these workers would be either hired locally or, if hired from outside the Blythe area, would relocate to the area. Due to the numbers of vacant homes for sale (100 units in the City of Blythe) or for rent (248 units in the city), there would be minimal impact to the local housing supply or the community, even if all permanent workers were to relocate to the Blythe area.

Regional Employment and Economy

The employment of 20 workers for operation and maintenance would not adversely affect the regional labor market with current (January through October 2011) unemployment rates of 13.9 percent in Riverside County and 10.5 percent in La Paz County, but instead would have a beneficial effect, particularly for Riverside County.

For input-output analysis, it is assumed that the 20-person operating staff would consist of workers in the following industries: 2 workers in electric power generation and transmission; 16 workers in electronic and precision equipment maintenance; and 2 security staff. Table 4.15-2 shows that total employment impact in the County, including direct, indirect, and induced impacts, would be 34 workers, with total income impact of $1.9 million, and output impact of $5.3 million per year.

TABLE 4.15-2
REGIONAL EMPLOYMENT AND INCOME IMPACTS FROM PROJECT OPERATION

Operation	Employment	Labor Income ($ Million)	Output ($ Million)
Direct Effect	20	$1.3	$3.6
Indirect Effect	6	0.2	0.6
Induced Effect	9	0.3	1.0
Total Effect	34	$1.9	$5.3

NOTE: Sectors modeled are 31 Electric Power Generation, Transmission, and Distribution; 416 Electronic and Precision Equipment Repair and Maintenance; and 387 Investigation and Security Services.
Region is Riverside County. Income and output are in 2011 dollars.
Figures may not add to totals as shown due to rounding.

SOURCE: MIG, 2011

Riverside County Tax Revenues

Pursuant to Riverside County Board of Supervisors Policy B-29, the solar plant site would be taxable at $450 per acre per year. The estimated tax revenue to the County would be $2 million per year, though this amount could be reduced through incentives and credits to a minimum of just under $1 million per year.

During Project operation and maintenance, another revenue source for the County would be property tax revenues. However, California Revenue and Taxation Code §73 exempts a newly constructed active solar energy system from property taxation. An "active solar energy system" includes the solar energy generation system, including PV modules, mounting and tracking systems, inverters, and electrical equipment "up to, but not including, the stage of transmission or use of the electricity" (BOE, 2004).

The largest improvement of the Project that would be subject to property taxation is the gen-tie line. Even when constructed on tax-exempt BLM land, private improvements such as the gen-tie line are taxable as possessory interest. The estimated length of this line, including both inside and outside the Project site boundaries, is 14.7 miles. The Applicant has not provided a cost estimate for the gen-tie line. However, an economic study of a similar solar PV energy project in Imperial County (Imperial County, 2011) estimated that construction of a 5-mile gen-tie line over BLM land would cost $12.4 million, or approximately $2.48 million per mile. Based on this example, it is estimated that the taxable value of the proposed gen-tie line, excluding land, would be $36.46 million.

The average rate of property taxation in the County in fiscal year (FY) 2009-10 was 1.089 percent, generating total taxes of approximately $2.3 billion (BOE, 2011a). This was distributed to the County, cities, schools, special districts, and other agencies. According to the Riverside County Assessor-County Clerk-Recorder's (ACR) office, property taxes distributed to local agencies in FY 2010-11 totaled $2.0 billion, of which 6.3 percent went to cities, 11.5 percent to the County, and the remainder to other agencies (Riverside County, 2011).

In unincorporated areas, the County's share of the 1 percent property tax is higher than the average for the County as a whole. For purposes of this analysis, it is assumed that the County would receive 17.8 percent of the 1 percent tax collected from the Project site. Estimated property tax revenue to the County from the gen-tie line thus would be approximately $64,900 per year. Although it is likely that the Project would generate additional property tax revenues from a new switchyard to be constructed near the SCE substation, as well as onsite improvements not directly related to solar energy generation, no cost estimates are available for these improvements.

Decommissioning

After 30 years of operation, the Project would be decommissioned, with all equipment and improvements dismantled and removed from the site, and the site would be restored to an undeveloped condition. Decommissioning would be completed by a workforce of 300 over a 24-month period.

Housing and Community

As in the case of Project construction, the temporary decommissioning workforce would likely come mostly from western Riverside County and a smaller number from the Blythe area and La Paz County. Many workers would likely commute to the Project site. For workers who choose to commute weekly and temporarily relocate to the Blythe area during the workweek, it is expected that sufficient numbers of rental properties and hotel and motel accommodations would be available in the area.

Regional Employment and Economy

It is difficult to forecast employment conditions for 30 years into the future. Even if unemployment rates in Riverside and La Paz counties decline to lower levels, such as those experienced in 2005 to 2007 (see Table 3.15-5), demand for 300 workers for decommissioning of the Project would not have an adverse impact on the regional or local labor market. Expenditures for decommissioning, including payments to workers, would have a beneficial effect on the regional economy. However, the linear input-output model of 2010 cannot be applied to the decommissioning work, since the regional economy undoubtedly will experience substantial changes in the intervening years.

Riverside County Tax Revenues

No substantial sales or property tax revenues would be generated during or after decommissioning.

4.15.4 Alternative 2: Reduced Acreage

4.15.4.1 Direct and Indirect Impacts

Construction

The construction workforce for Alternative 2 is expected to be the same as for the Proposed Action; therefore, there would be a sufficient supply of temporary housing options to accommodate workers who may seek temporary housing near the jobsite. Additionally, estimated impacts on regional employment, worker income, and the output of construction companies are the same as those shown in Table 4.15-1. However, the annual economic effects described would occur only during Alternative 2 construction, which could be up to 24 months shorter than the Proposed Action.

The total material cost of Alternative 2 materials and supplies would be around $613 million for the 250 MW facility. The 1.5 percent sales tax revenues allocated to the County (excluding the Local Public Safety Fund) therefore would be $9.2 million. Based on an allocation to the County of 10.9 percent of the countywide pool, the County would receive about $1.0 million in sales tax revenues from construction materials. This economic benefit would be approximately one third that of the Proposed Action.

Operation and Maintenance

Because of its reduced size, Alternative 2 would be expected to generate just over $1 million per year of operation under Riverside County Board of Supervisors Policy B-29.

Permanent operation and maintenance staff for Alternative 2 would require approximately 13 workers, who would be expected either to be hired locally or to relocate to the area. This would be a reduced number of staff compared to the Proposed Action. Nonetheless, there would be no substantial difference in impact to the local housing supply or the community between Alternative 2 and the Proposed Action.

The analysis of employment and income impacts of Alternative 2 is based on the analysis prepared for the Proposed Action, and it is assumed that the impacts would be proportional to those of the Proposed Action (i.e., 13/20, or 65 percent). Table 4.15-3 shows that the total employment impact in the County, including direct, indirect, and induced impacts, would be 23 workers, with total income impact of $1.2 million, and output impact of $3.5 million per year. This would be a reduced benefit compared to the Proposed Action.

TABLE 4.15-3
REGIONAL EMPLOYMENT AND INCOME IMPACTS FROM PROJECT OPERATION

Operation	Employment	Labor Income ($ Million)	Output ($ Million)
Direct Effect	13	$0.9	$2.3
Indirect Effect	4	0.1	0.4
Induced Effect	6	0.2	0.7
Total Effect	23	$1.2	$3.5

NOTE: numbers were generated by applying a 65% reduction to the numbers in Table 4.15-2; Region is Riverside County. Income and output are in 2011 dollars.
Figures may not add to totals as shown due to rounding.

Decommissioning

The decommissioning workforce is anticipated to be the same as for the Proposed Action; therefore, there would be a sufficient supply of temporary housing options to accommodate workers who may seek temporary housing near the jobsite. Additionally, estimated impacts on regional employment and economics are the same as for the Proposed Action, except that the decommissioning phase, and therefore the period in which benefits would occur, could be shorter.

4.15.5 Alternative 3: Reconfigured Gen-tie/Access Road Routes

4.15.5.1 Central Route

Direct and Indirect Impacts

The Central Route would be shorter than the proposed gen-tie line and access road route. Nonetheless, the construction, operation, maintenance, and decommissioning workforce associated with the Central Route would be the same as that required for the Proposed Action. Consequently, there would be no substantial difference between the Central Route and the Proposed Action with respect to workforce-related effects.

During operation and maintenance, the Central Route would be taxable as possessory interest. Based on the assumptions used for the Proposed Action, it is estimated that the taxable value of the Central Route would be $5.5 million less than that of the Proposed Action. Based on this value, the County would receive approximately $9,700 less per year in property taxes for the Central Route than for Proposed Action.

4.15.5.2 Western Route

Direct and Indirect Impacts

The Western Route would be slightly longer than the proposed gen-tie line and access road route. Nonetheless, the construction, operation, maintenance, and decommissioning workforce associated with the Western Route would be the same as for the Proposed Action. Consequently, there would be no substantial difference between the Western Route and the Proposed Action with respect to workforce-related effects.

During operation and maintenance, it is estimated that the taxable value of the Western Route would be $2 million more than that of the Proposed Action. The County would receive approximately $3,500 more per year in property taxes for the Western Route than for Proposed Action.

4.15.6 Alternative 4: No Action Alternative

The baseline conditions associated with socioeconomics would continue under Alternative 4. Under this Alternative, no jobs, population growth, or economic effects would be created. Therefore, Alternative 4 would have no adverse impact with respect to social and economic effects and would not generate the beneficial impacts that would result from the Proposed Action.

4.15.7 Cumulative Impacts

The potential for cumulative socioeconomic impacts exists where there are multiple projects proposed in an area that have overlapping construction schedules and/or project operations that could affect similar resources. Projects with overlapping construction schedules and/or operations could collectively result in a demand for labor that cannot be met by the region's labor pool, which could lead to an influx of non-local workers and possibly their dependents. This population increase could impact social and economic resources if there are insufficient housing resources and/or infrastructure and public services to accommodate the new residents' needs.

Section 4.1.5 identifies current solar and non-solar projects that have been or could be developed in the foreseeable future within eastern Riverside County. While a large number of projects may be planned, and so considered to be possible for future development, not all of them are expected to actually be built due to construction funding constraints, schedule, and/or delays. Given the uncertain and challenging economic circumstances facing federal and state economies as well as private developers, it is far from assured that future funding and other necessary support will be sufficiently available for all of the proposed projects to be realized within the projected schedules.

As shown in Table 4.1-1, currently more than a dozen BLM renewable energy projects are identified in the cumulative project scenario for the social and economic analysis. In addition, seven other projects are also identified that could require workers with similar skills to the Project, including non-BLM renewable energy projects, transmission lines, and electrical substations. The geographic scope of the cumulative impacts analysis includes populated areas within a 2-hour commute distance of any of these projects, which would extend as far west as

Moreno Valley, given the locations of the cumulative projects. Although the 2-hour commute distance would also extend into Arizona, the low population in western Arizona would contribute minimally to the available labor pool in the geographic scope (242 total construction workers in La Paz County). Therefore, the analysis for employment focuses on the California portion of this area. The communities within the geographic scope have a combined population of 533,107, approximately 24 percent of Riverside County as a whole (U.S. Census Bureau, 2012).[1]

There are 17 solar projects proposed or under construction along the I-10 corridor predominantly between Desert Center and Blythe. Based on the currently available data for these various projects (information obtained from Plans of Development and other project documents), and assuming all projects move forward, these projects would be constructed in the same general timeframe as the proposed action (i.e. between 2013 and 2016).

The cumulative analysis conservatively assumes that the construction of all of the proposed solar projects would be under construction within the 46-month cumulative timeframe for construction-related impacts of the Project. This cumulative impacts discussion is based on available data with respect to both construction schedules and the projects' labor requirements. If construction and operating labor requirements are not known for some projects, average work force levels of other comparable projects and professional judgments have been used to develop conservative estimates of expected cumulative labor requirements for these projects.

4.15.7.1 Economic

Construction

Cumulative Construction Labor Needs

Table 4.15-4 shows the currently available data about project construction workforces for several of the projects in the cumulative scenario and this Project. These numbers were used to estimate the average and peak construction workforces per MW of solar projects, which were then used as workforce estimates for those projects in the cumulative scenario for which no workforce data is available.

If all of the 14 BLM-administered and three County-administered solar projects identified in eastern Riverside County are constructed (including the Project), a total of 6,590 MW of new solar power would be developed. The average solar power project would be approximately 390 MW in size and may be expected to require an average of approximately 420 full-time equivalent (FTE) construction workers and a peak of 800 workers to be built.[2] Because the precise construction schedules for each project are currently unknown, this analysis assumes that the peak construction periods of the solar projects in the cumulative scenario would be of a similar

[1] The geographic scope includes: Blythe CCD, Chuckwalla Valley CCD, Coachella Valley CCD, Desert Hot Springs CCD, Cathedral City-Palm Desert CCD, Palm Springs CCD, and San Gorgonio Pass CCD.

[2] This is based on an estimated average construction labor need of approximately 1.08 construction workers (FTE) per MW of solar power production capacity on average and 2.05 workers per MW during peak construction, see Table 4.15-4.

**TABLE 4.15-4
AVERAGE AND PEAK CONSTRUCTION EMPLOYMENT FOR
CUMULATIVE SCENARIO SOLAR PROJECTS**

Project	MW	Average Workers	Peak Workers
McCoy	750	341	750
Palen	500	566	1,145
Genesis	250	646	1,085
BSPP	1,000	604	1,004
Desert Sunlight	250	450	570
Rice	150	280	438
Rio Mesa	750	1,050	2,500
Column Total	3,650	3,937	7,492
Average for all Projects (per MW)		1.08	2.05

SOURCE: BLM, 2005, 2010a, 2010b, 2011a, 2011b; BrightSource, 2011;CEC, 2010; CPUC, 2006, 2011.

length to the Project (3 months). Project developers would likely seek to minimize the construction occurring during the hottest summer months and may therefore stagger their construction periods accordingly. Consequently, some seasonality may be expected to occur as developers favor more construction during the region's cooler winter months. It is assumed that peak construction needs for each of the solar projects would be approximately evenly spread throughout the 46-month period for cumulative construction-related impacts. If all of the projects experienced their peak construction during the 46-month cumulative temporal scope, the regional labor need for a realistic "worst case condition" would be for four projects to have peak labor needs during the same winter season. Therefore, the equivalent of 4.25 average (390 MW) solar projects could experience peak construction at one time. This gives an average cumulative solar workforce of approximately 8,800 workers.[3] Under the extremely improbable circumstance that peak construction of all 17 planned solar projects happens concurrently, they would require a maximum of 13,600 construction workers at one time.

In addition to the solar projects described, additional projects that could require similar types of construction labor would include the DPV2 Transmission Line, Desert Southwest Transmission Line, and CRS Expansion projects. The DPV2 project is estimated to require 211 construction workers for the segment in the geographic scope (CPUC, 2006). The CRS Expansion project is estimated to require up to 40 construction workers (CPUC, 2011). The Desert Southwest Transmission Line project is estimated to require an average of 71 construction workers (BLM, 2005). Adding these workforces to the average solar construction workforce derived above yields a total of approximately 9,100 workers.

[3] Final cumulative workforce estimates are rounded to reflect the uncertainty that results from making assumptions about projects for which data is not currently available.

Because not all of the cumulative projects would be under construction for the entire 46-month Project construction period, the actual cumulative construction workforce may be lower. However, it is reasonable to assume that other future projects that are not yet known for this Project's cumulative scenario may begin construction later in this time period. For this reason, a rounded winter-season peak of approximately 9,000 construction workers is used in this analysis.

The Project's maximum potential contribution to this cumulative effect would be approximately 8.3 percent during its own peak construction period. The Project's average contribution to the cumulative impact would be approximately 3.8 percent during its non-peak construction.

Regional Labor Force Supply

As discussed previously, the total work force of skilled construction workers currently living in Riverside County is estimated to be approximately 35,600 (Table 3.15-3). Assuming that these workers are evenly distributed throughout Riverside County, the total construction work force within the geographic scope would be approximately 24 percent of this, or 8,550 workers. Future demand for 9,000 construction workers would exceed the capacity of the current skilled labor force. Although the population of skilled construction workers in the Riverside-San Bernardino-Ontario MSA is expect to increase by approximately 5 percent by 2018 (Table 3.15-6), even if this level of growth occurred in the geographic scope, the cumulative labor force demand would still represent more than the region's currently forecasted future skilled construction labor force.

The current unemployment rate in Riverside County is estimated to be 13.9 percent (see Table 3.15-5). Applying this rate to the skilled construction workers in the geographic scope yields an estimate of approximately 1,190 unemployed construction workers. The cumulative construction worker demand would represent nearly eight times this number. Although many of the region's currently unemployed residents may lack transferable skills or have the physical aptitude to acquire the necessary skills required to serve the cumulative labor demand, many residents could be trained to be employable by these projects. Further, some of the construction work would be more entry-level positions which may be suitable for less skilled workers.

Some of the regional workforce currently employed in other sectors also could have the capabilities to qualify for Project construction work. In such cases, some job transferring may occur, particularly because the construction jobs may be expected to be relatively well-paid and attractive for many local residents. The less skilled or desirable jobs vacated by individuals transferring to construction work could be filled by other less skilled unemployed residents.

Housing and Lodging Impacts within the Local Study Area

Notwithstanding the potential for employed and unemployed non-construction workers to qualify for the construction jobs of the cumulative scenario, there would be a demand for construction workers that would exceed the available labor supply within the geographic scope. It is assumed that those job positions would be filled by workers relocating into the region from elsewhere.

Given the numerous variables discussed above, it is difficult to project the extent of future weekly commuting or other in-migration that would be necessary to meet the future cumulative labor needs within the region. However, as a conservative assumption, it is assumed that up to 7,500 construction workers could require temporary housing in the local or regional area.

The skilled construction labor force within the areas of Riverside County outside of the geographic scope is estimated to be approximately 27,050. This suggests that there is likely to be a considerable additional potential labor force available willing to commute weekly or to relocate temporarily to the area. Consequently, from a broader geographic and labor force perspective, no significant shortages of adequately skilled construction workers is foreseen, provide that adequate suitable housing is available for relocating near the work sites.

The cumulative influx in construction labor to the area could create demand for temporary housing that is greater than the existing supply of temporary lodging. As discussed in the previous construction impact analysis, private and public RV/campgrounds are not expected to be suitable or attractive lodging options for most construction workers seeking local accommodations. There are expected to be approximately 450 vacant rental units and 296 vacant hotel and motel rooms available in the local area. Assuming that about half of the construction workers might be willing to share accommodations to save on their lodging costs, the existing local rental units, hotels, and motels could be able to house up to 1,125 construction workers seeking local temporary housing. If these workers were willing to commute up to 2 hours to the site daily, the supply of vacant rental units and hotel and motel rooms increases to an estimated 5,084 rooms, which would house up to 7,600 construction workers. This would be sufficient to temporarily house the approximately 7,500 construction workers that could move into the area as a result of the cumulative projects; however, any unforeseen increase in worker demand or decrease in availability of lodging could exceed the capacity of the communities within the geographic scope to adequately house these workers.

Irrespective of the availability of temporary housing, it may be expected that, even under future cumulative conditions, a relatively small proportion of construction workers would choose to relocate permanently to the local communities where they would be employed during construction. This is because many construction workers could choose to commute relatively long distances to their work sites and may expect to seek work within the more populated areas of Riverside and San Bernardino Counties in the future.

Furthermore, during the same time period with the greatest potential for adverse impacts resulting from the cumulative demand for construction worker housing, there also would be a major positive economic stimulus to the Blythe area and eastern Riverside County economies associated with the solar development. This economic infusion could result in the construction or availability of additional rental units and so could offset a portion of the housing need-related impact.

In summary, there is potential for short-term adverse cumulative social and economic impacts in the Blythe area associated with the demand for skilled construction labor for the cumulative projects proposed for future development within eastern Riverside County. Analysis suggests that future construction labor demand would exceed the existing local work force within eastern Riverside County. Therefore, there may be increased demand for temporary local housing from construction workers seeking to commute weekly to the local area. Given the estimated availability of lodging and possible rental housing, it is expected that there could be a shortage of adequate and suitable housing to meet all future construction worker temporary housing demand. Therefore, some adverse social or economic impacts could result if the demand for housing increased the price for local residents seeking housing, and/or if hotel and motel vacancy rates fell such that rooms were not available for potential visitors to the area who would otherwise generate economic stimulus from vacation-related spending. However, much of this lost economic income would be offset by the income that would result from these projects.

Operations

If all of the cumulative projects are constructed, a total of 6,590 MW of new solar power would be developed. As shown in Table 4.15-5, the average solar project is estimated to require approximately 0.18 operational employees for each MW of solar power production. Consequently, if full build-out of the planned solar development occurs, the future cumulative operational employment in the region would be approximately 1,180. The Project's 20 operational jobs represents an approximately 1.7 percent contribution to the cumulative operation- and maintenance-related need. Because the other cumulative project for social and economic effects include an expanded electrical substation and transmission lines, it is not anticipated that these would add noticeably to the cumulative operational employment demand.

TABLE 4.15-5
OPERATIONAL EMPLOYMENT FOR CUMULATIVE SCENARIO SOLAR PROJECTS

Project	MW	Employees
McCoy	750	20
Palen	500	134
Genesis	250	65
BSPP	1,000	221
Desert Sunlight	250	15
Rice	150	47
Rio Mesa	750	150
Column Total	3,650	652
Average for all Projects (per MW)		0.18

SOURCES: BLM, 2005, 2010a, 2010b, 2011a, 2011b; BrightSource, 2011; CEC, 2010; CPUC, 2006, 2011.

As shown in Table 3.15-3, there are 19,500 workers in the "Transportation, Warehousing & Utilities" industry group in Riverside County, for a total of approximately 4,860 workers within the geographic scope. Although not all workers in this category may possess the skills required for solar power plant operation and maintenance, the transferability of other skills, on-the-job and local community college training opportunities, and the lower skilled qualification requirements for some of the jobs suggest that there would be many others outside this category who would be able to meet the cumulative operational labor needs. Therefore, in the absence of more precise data on available skills, this industry group is used as the available labor pool for this analysis.

Based on current unemployment rates, it is assumed that approximately 675 of these workers would be available to meet operational labor needs (this number is rounded to 700 to account for the low level of precision inherent in the preceding assumptions).

Therefore, there could be an in-migration of up to 480 operational workers to meet the cumulative labor need. As described in Section 3.15, there are 682 vacant housing units for sale or rent in the Blythe, Ehrenberg, and Quartzsite areas, which would be sufficient to accommodate the housing needs of these workers and their families. Additionally, as shown in Table 4.1-4, there are a number of residential developments proposed in Blythe that could be expected to be built by the start of the solar power plants' operation. Furthermore, the relatively limited number of new residents would not be expected to result in any noticeable change to the local communities' social composition or character. The future operations of the solar projects would also generate significant annual economic benefits in local employment, direct and indirect spending at local businesses, and positive sales and other tax benefits for the local area. Consequently, the cumulative social and economic effect of the future operations of the solar projects would be minor and primarily beneficial, although the increased demand for housing and subsequent decrease in supply could increase housing prices in the local area, a potentially adverse effect for current residents or others seeking to move into the area.

Decommissioning

Evaluating the Project's cumulative impacts when future facility decommissioning occurs is highly speculative. Decommissioning is expected to occur after 30 years of operation. It is not possible to project with confidence the likely future social and economic conditions of the local and regional study area. Similarly, the extent to which the projects in the cumulative scenario would undergo decommissioning concurrently is unknown.

Nonetheless, Project decommissioning is expected to require a workforce similar to the construction phase, and the Project is expected to be one of many similar solar projects within eastern Riverside County. As such, its contribution to cumulative social and economic effects would be proportional to: (a) its size relative to the other development projects in the region; and (b) the collective size of projects undergoing decommissioning or construction at that time. Although the cumulative effects of construction were found to be potentially adverse based on a shortage of temporary housing, decommissioning would not likely overlap with as many projects as construction, and in over 30 years' time, based on regional population growth trends, it is likely that there would be more local workers and more temporary housing options available to accommodate decommissioning needs.

4.15.7.2 Social

Construction

The cumulative impact of the many proposed future solar and non-solar development projects in eastern Riverside County would result in considerable short-term construction activity at many locations throughout the region. As described previously, future cumulative demand for construction workers for these projects could exceed the available supply of skilled construction workers living in the region. In this case, construction workers from elsewhere could be attracted to the area by the construction employment opportunities.

The ongoing construction activity in the region, influx of construction workers both commuting daily to the site and those who could choose to temporarily live in the local area could noticeably alter the social character and environment within Blythe and the other local communities. An in-migration of 7,500 construction workers would be equivalent to nearly 28 percent of the total population of the Blythe, Ehrenberg, and Quartzsite communities and, consequently, would likely be very noticeable.

The potential influx of construction workers to the local area would be accompanied by an increase in economic activity from their spending in local business establishments. In addition, the planned new development projects would also make purchases from local businesses for construction materials and supplies and various kinds of services.

The effects of the increased activity on local attitudes and quality of life may vary among residents. While some residents may be displeased by increased traffic, new visitors and temporary residents (particularly those employed or otherwise benefiting economically from the construction) could welcome the development.

However, an influx of new workers also could increase the demand for certain kinds of government services and infrastructure (e.g., police and fire services and medical facilities and services). There have been other past instances of rapid growth in rural areas as a result of energy-related development, most notably the energy boom in the 1970s in states such as Wyoming. A number of communities, such as Rock Springs and Gillette, Wyoming, became known as “boomtowns,” and the local economic benefits from the new energy development in the region were accompanied by some social changes that were not seen as positive by many existing residents. These included changes such as growth in number of bars, higher crime rates, and perceived (by some) aesthetic degradation due to rapid growth occurring to accommodate the sudden increase in population.

The presence of existing larger communities (such as Indio and Coachella) that are within possible commuting range for construction workers could suggest that circumstances may differ substantially from those facing the more isolated Wyoming boomtown communities in the past. However, there would remain a potential for temporary social impacts in the Blythe, Ehrenberg, and Quartzsite areas.

Operation and Maintenance

As discussed in the corresponding economic cumulative analysis, Project operation and maintenance would be expected to have a minor and beneficial effect on the local and eastern Riverside County economy. In the cumulative scenario, there would be an in-migration population of only 420 solar plant operation and maintenance workers. There is likely to be more than sufficient available local housing to accommodate the housing needs of these workers and their families. Furthermore, the relatively limited number of new residents would not be expected to result in any noticeable change to the local communities’ social composition or character. The existence and operation of the solar projects themselves could result in changes to the character and culture of the area by converting open space, one of the primary land uses in eastern Riverside County, to solar plants. The PVVAP (Riverside County, 2008) notes that "The character of the area is reflected by the prominence of the Open Space-Rural and Agriculture land use designations here." A reduction in the amount of open space in eastern Riverside County due to solar plant development could result in cultural changes to the area, such as reduced use of desert recreational opportunities and an altered sense of the character of the area relative to that described in the PVVAP. The future operations of the solar projects also would generate significant annual economic benefits in local employment, direct and indirect spending at local businesses, and positive sales and other tax benefits for the local area. The cumulative social and economic effect of the future operations of the solar projects would be minor and beneficial.

Decommissioning

As discussed in the corresponding economic cumulative analysis, there is insufficient information to reliably project the conditions when decommissioning of the proposed facilities would occur in 35 or more years into the future. Consequently, it would be speculative to try to characterize the future situation and circumstances under which facility decommissioning would occur. Similar to the economic cumulative analysis, it is anticipated that the effects from decommissioning could be of the same type and nature as those from construction, but would not likely be of the same magnitude.

4.15.7.3 Alternatives

Alternative 2: Reduced Acreage

The construction spending and time frame for Alternative 2 would be reduced compared to that of the Proposed Action; however, the construction and decommissioning workforces are anticipated to be the same. Consequently, this alternative's contribution to a cumulative impact during construction and decommissioning would be the same as for the Proposed Action, but would occur over a shorter time period. The operational workforce would be 13 employees, which is fewer than the Proposed Action. Therefore, this alternative's contribution to a cumulative impact during operation would be reduced compared to the Proposed Action. Nonetheless, there would be no substantial difference between Alternative 2 and the Proposed Action.

Alternative 3: Reconfigured Gen-tie/Access Road Routes

Central Route

The Central Route would have a slightly smaller contribution to cumulative economic benefits from taxes due to its shorter length. The construction, operation, maintenance, and decommissioning workforces and time frames would be the same as for the Proposed Action.

Western Route

The Western Route would have a slightly larger contribution to cumulative economic benefits from taxes due to its longer length. The construction, operation and maintenance, and decommissioning workforces and time frames would be the same as for the Proposed Action.

Alternative 4: No Action Alternative

Because no solar power plant would be constructed at the Project site, no impact would occur.

4.15.8 Mitigation Measures

None recommended.

4.15.9 Residual Impacts after Mitigation Incorporated

Not applicable.

4.16 Special Designations and Lands with Wilderness Characteristics

4.16.1 Methodology for Analysis

This analysis of potential effects of the Project and Alternatives related to Special Designations focuses on whether construction, operation, maintenance, and decommissioning of the Project would conflict with the status or management goals of the specially designated areas in the vicinity of the Project. These designations include six National Wilderness Areas, four ACECs, and a National Back Country Byway. In addition to the formally designated areas, lands with wilderness characteristics are adjacent to and within the boundaries of the Project site.

The analysis reviews the Project in relationship to the specific legislation and guidance which are required in the designation and management of Special Designations. These are: FLPMA, CDCA, NECO, the Wilderness Act of 1964, and the National Back Country Byways Program. Additional discussion related to impacts within special designation areas is found in Sections 4.3, *Biological Resources – Vegetation*; 4.4, *Biological Resources – Wildlife*; 4.10, *Lands and Realty,* and 4.14, *Recreation and Public Access (Off-Highway Vehicles).*

4.16.2 Applicant Proposed Measures

There are no APMs to address potential effects to special designations.

4.16.3 Alternative 1: Proposed Action

4.16.3.1 Direct and Indirect Impacts

The Proposed Action would have no effect on existing special designations, specifically the six National Wilderness Areas, four ACECs, and a National Back Country Byway, since the Project site is not subject to any such special designation. Indirect effects could include the generation of noise and dust during all phases of the Project. However, as discussed in Section 4.12, *Noise*, the loudest noise associated with the Project (during the construction phase) would attenuate such that the sound would be barely audible to users of the nearest wilderness area, Palen-McCoy Wilderness. Additionally, as discussed in Section 4.2, *Air Resources*, all phases of the Project could generate dust in the form of PM10 and PM2.5, but these emissions would occur within the Project fence line and drop off quickly with distance, with no effect on special designations.

The Proposed Action would have a direct impact on the 1,089 acres within Unit 2 of the Project which have been identified as lands with wilderness characteristics. The identification of these lands did not specify which characteristics were present on these 1,089 acres. Construction, operation, maintenance, and decommissioning of the Project would prevent this acreage from future consideration as wilderness by Congress. This is primarily because the 1,089 acres occupied by the Project no longer would meet the criteria of being in a “natural condition.” Implementation of Mitigation Measure LWC-1 requires the Applicant prepare and implement, if approved, a proposal to mitigate for the loss of these lands with wilderness characteristics through enhancements in the Big Maria Mountains and Palen-McCoy Wilderness Areas, which are the closest designated wilderness areas to the Project.

The Project also could result in indirect impacts such as noise and air quality impacts to lands with wilderness characteristics outside of the Project fence line. There are 5,812 acres of lands with wilderness characteristics within approximately 2 miles of the Project fence line, and recreational users of these lands could experience construction-related noise above ambient noise levels, as well as minor air quality impacts within close proximity to the Project. The effects of Project-related noise and dust on these users are described in Section 4.14, *Recreation and Public Access (Off-Highway Vehicles)*. Impacts would be minor and temporary.

The Project would not result in direct or indirect effects on the natural condition of lands with wilderness characteristics outside of the Project area. As discussed in Sections 4.3, *Biological Resources – Vegetation*, and 4.4, *Biological Resources – Wildlife*, indirect effects to vegetation and wildlife could occur as a result of the spread of invasive species outside of the Project Area due to the presence of construction and maintenance vehicles, as a result of altered hydrology, and/or as a result of the loss of wildlife habitat connectivity. The Project does not propose to construct or use off-site roads within the lands with wilderness characteristics outside of the Project fence line, and would not result in the potential for the introduction of invasive species within these lands. Additionally, the Project would be located downstream of these lands with wilderness characteristics, so no Project-related changes in off-site hydrology could occur within these lands. Although the Project would create a movement barrier for large wildlife due to the exclusion fencing, within off-site lands with wilderness characteristics, the Project would have no effect on wildlife habitat connectivity. The Project would not indirectly affect the natural condition of these lands with wilderness characteristics.

4.16.4 Alternative 2: Reduced Acreage

4.16.4.1 Direct and Indirect Impacts

The Reduced Acreage Alternative would have no effects on existing special designations including lands with wilderness characteristics. Unit 1 is not subject to any such special designation, and no new designations or amendments to existing designations are proposed that would incorporate Unit 1. Therefore, the Reduced Acreage Alternative would have a reduced effect compared to the Proposed Action.

4.16.5 Alternative 3: Reconfigured Gen-tie/Access Road Routes

4.16.5.1 Central Route

Direct and Indirect Impacts

The Central Route would have no effect on existing special designations including lands with wilderness characteristics. The Central Route is not subject to any such special designation, and no new designations or amendments to existing designations are proposed that would incorporate the Central Route. Because the proposed Eastern Route is included in Unit 1 of the Proposed Action and because no lands in Unit 1 have been identified as having wilderness characteristics, the Central Route would have the same effect (no impact) as the gen-tie line and access road route proposed as part of the Project.

4.16.5.2 Western Route

Direct and Indirect Impacts

The Western Route would have no effect on existing special designations, including lands with wilderness characteristics. The Western Route is not subject to any such special designation, and no new designations or amendments to existing designations are proposed that would incorporate the Western Route. Because the proposed Eastern Route is included in Unit 1 of the Proposed Action and because no lands in Unit 1 have been identified as having wilderness characteristics, the Western Route would have the same effect (no impact) as the gen-tie line and access road route proposed as part of the Project.

4.16.6 Alternative 4: No Action Alternative

The No Action Alternative would have no effect on special designations because no action or project would be implemented. The lands identified as having wilderness characteristics would not be affected and could be managed to protect those characteristics in the future.

4.16.7 Cumulative Impacts

The Proposed Action, Reduced Acreage Alternative, and Reconfigured Gen-tie/Access Road Routes would have no impacts on special designations such as National Wilderness Areas, ACECs, and a National Back Country Byway; therefore, they would not cause or contribute to any cumulative impact in this regard.

However, the Proposed Action would affect lands with wilderness characteristics. Therefore, the geographic scope of the cumulative effects analysis for this effect would be an area of approximately 30,200 acres within the McCoy Wash that has been identified as lands with wilderness characteristics (Figure 4.1-1). Effects would occur throughout the life of the Project and beyond. The Proposed Action, specifically implementation of Unit 2, would affect approximately 1,089 acres of lands with wilderness characteristics. Implementation of the enXco

McCoy Project, just north of the Project, could affect up to 7,150 of lands with wilderness characteristics. Therefore, a total of 8,240 acres or approximately 27 percent of the area identified as lands with wilderness characteristics could be affected by being prevented from future consideration as wilderness. Implementation of Mitigation Measure LWC-1 could offset impacts specific to the Proposed Action through enhancement of off-site lands. The enXco McCoy Project would likely be required to implement similar measures. Implementation of off-site measures would not avoid the cumulative effect to up to 8,240 acres of lands with wilderness characteristics within the McCoy Wash, but would be a net benefit to nearby designated wilderness areas.

4.16.8 Mitigation Measures

LWC-1: Wilderness Characteristics Mitigation Plan. Prior to issuance of a Notice to Proceed in those areas of in Unit 2 of the MSEP having wilderness characteristics, the Applicant shall prepare a proposal to mitigate for the loss of approximately 1,089 acres of lands with wilderness characteristics that would result from the construction of Unit 2. On-site mitigation is infeasible. Therefore, the mitigation plan shall be focused in the Big Maria Mountains and Palen-McCoy Wilderness Areas, which are the closest designated wilderness areas to the project. Mitigation may be implemented in either of these areas or a combination of them and may include:

1. Removal and restoration of approximately 15 miles of unauthorized vehicle routes;
2. Conversion of approximately 3 miles of vehicle route into a hiking trail;
3. Installation of vehicle barriers and signing along publicly accessible portions of the wilderness boundaries; and/or
4. Development of a visitor education and information program aimed at reducing illegal vehicle access into the areas.[1]

4.16.9 Residual Impacts after Mitigation Incorporated

The implementation of Mitigation Measure LWC-1 not avoid impacts related to lands with wilderness characteristics on the Project site, but would offset impacts to wilderness areas near the Project by restoring and/or enhancing routes, trails, and other resources within designated wilderness areas in proximity to the project site.

[1] Implementation of restoration measures may require additional NEPA analysis as well as biological and cultural resources surveys as locations for such work has not been agreed upon or surveyed during this PA/EIS process.

4.17 Transportation and Traffic

This section describes conditions related to transportation and traffic during Project construction and post-construction periods. Discussed are the potential impacts associated with construction, operation, maintenance, and decommissioning of the Project; and mitigation measures to reduce or avoid adverse transportation and traffic effects.

4.17.1 Methodology for Analysis

This analysis focuses on potential impacts related to the construction, operation, maintenance, and decommissioning of the Project on the surrounding transportation systems and roadways using information in the Transportation Impact Analysis prepared for the Applicant (Tetra Tech EC, Inc., 2011) that has been independently reviewed on behalf of the BLM by its environmental consultant. Impacts to local transportation systems were evaluated based on LOS determinations, which is a generally accepted measure used by traffic engineers, planners, and decision-makers to describe and quantify the congestion level on a particular roadway or intersection based on specific characteristics of traffic flow on designated sections of roadway during a typical day. For mainline freeway and roadway segments, these characteristics include overall traffic volume, speed, and density.

In addition, the analysis used methodology contained in the 2000 *Highway Capacity Manual* (Transportation Research Board, 2000) to determine potential impacts to roadways from operation of the Proposed Action. Several physical and operational characteristics of the roadway, such as lane configuration and flow speed (typical speed along a roadway segment) are used to determine the vehicular capacity of the roadway segment. When these two sets of data are compared, a volume-to-capacity (v/c) ratio is calculated. The v/c ratio then is assigned a corresponding letter grade to represent the overall condition of the roadway or level of service. These grades range from LOS A (best operating conditions characterized by free-flow traffic, low volumes, and little or no restrictions on maneuverability) to LOS F (worst operating conditions characterized by forced traffic flow with high traffic densities, slow travel speeds, and often stop-and-go conditions).

The assessment of transportation-related impacts is based on evaluations and technical analyses designed to compare the pre-Project conditions to conditions with Project implementation.

4.17.2 Applicant Proposed Measures

The Applicant has proposed the following APM to minimize impacts on Transportation and Traffic from the Project. The impact analysis assumes that the applicable APM would be implemented as part of the Project to address the impacts discussed below:

> **TRANS-1:** To minimize the potential for any peak a.m. or p.m. work day delays associated with the Mesa Drive, Black Rock Road, and Hobson Way intersections: The Applicant would reduce the number of vehicles on these approaches by splitting construction crews with staggered start times to reduce peak arrivals by about half; encouraging carpooling by

workers; and scheduling Project deliveries and truck trips for off-peak hours in order to avoid interference with the peak on-site worker a.m. and p.m. commute.

4.17.3 Alternative 1: Proposed Action

4.17.3.1 Direct and Indirect Impacts

Construction

Project construction is anticipated to occur over 46 consecutive months, beginning with pre-construction activities in March 2013. Construction of the Project would occur over sequential stages, as construction of Unit 1 and the linear facilities would occur first, requiring about 24 months, followed by construction of Unit 2, which is expected to take approximately 22 months. The estimated completion date for the Project is December 2016. Construction generally would occur between 7:00 a.m. and 7:00 p.m., Monday through Friday; however, additional hours may be necessary to make up schedule deficiencies or to complete critical construction activities. During the startup phase of the Project (Months 22 through 25, and 44 through 46), equipment and system testing and similar activities could continue 24 hours per day, 7 days per week.

An approximately 15-acre temporary lay down area would be located within the boundaries of Unit 1 solar plant site to support office trailers, parking for the construction workers, and space for vehicle turn-around and maneuvering. The Unit 2 solar plant site temporary lay down area would be approximately 13 acres and support the same types of activities as Unit 1. Lay down areas would provide adequate parking areas to accommodate all construction-related vehicles requiring parking on site.

Construction activities primarily would occur on-site, within the boundaries of the Project; however, construction and installation of the proposed gen-tie line would require construction vehicles to access the tower sites along adjacent roadways. No construction activity would occur within the public right-of-way. Furthermore, in order to access work sites that would not be accessible via existing roads, up to 125 new spur roads would be constructed. Construction of new access roads would require clearing, grubbing, and light grading, prior to the installation of rock road base and asphalt paving. Construction of access roadways would take a period of up to 18 alternating months and a peak of 24 on-site personnel.

Construction Traffic

Worker Vehicle Trips. Table 2-9 in Section 2.4.10, *Construction Schedule, Equipment, and Workforce*, presents the construction activities scheduled per month, per year; and provides the number of estimated workers associated with each construction activity. The total number of construction workforce is expected to range between 43 and 600 workers, with the peak workforce (approximately 600 workers) on-site during August through October of 2015. The average on-site construction workforce would consist of approximately 341 construction, supervisory, support, and construction management personnel. To ensure that vehicle trip generation is not underestimated for the analysis of potential impacts, it is assumed that all workers would travel to and from the Project site in their own vehicles on a daily basis. Therefore, it is expected that up to 600 workers would commute inbound to the Project site during the morning peak period, and those workers would commute outbound during the evening peak period.

Haul Truck Trips. Approximately 10 to 20 deliveries would occur per day (each 50 miles round-trip) during construction, with an expected peak of approximately 25 to 30 deliveries per day during the months of July 2015 through November 2016 for delivery of the modules, trackers, and cabling. All truck deliveries would be scheduled outside normal peak commute periods and would not interfere with the peak on-site worker commute time frame.

Vehicle Trip Distribution. The majority of the construction workforce for the Project would be drawn from the surrounding local and regional areas, including the Blythe and Indio areas (e.g., Coachella, Thermal, and Mecca), areas south of the Project site, and the Arizona areas of Quartzite and Ehrenberg. This analysis considers the possibility that workers could come from as far away as Brawley and El Centro in California or Cibola and Phoenix in Arizona even though travel to and from the site would require more than two hours in each direction. A small number of workers also are expected to travel from the greater Los Angeles Basin. Due to the length of the daily commute to the Project site from the out-lying areas, it is expected that the construction workers would be temporarily housed in either the Blythe or Indio areas, both of which have access to I-10. Based on the origin-location of construction workers commuting to and from the Project site, approximately 60 percent of construction workforce traffic (360 of the peak daily workforce) would originate east of the Project site (Blythe and Arizona towns), and would travel west on I-10 to access the Project site, and approximately 40 percent of workforce traffic (240 of the peak daily workforce) would originate west of the Project site (Indio, Palm Springs, etc.), and would travel east on I-10 to access the Project site. A small number of workers from Blythe are expected to use Hobson Way and travel west directly to Black Rock Road.

Construction Impacts

As stated above, a maximum of 600 daily round trips (1,200 one-way trips) would be generated by worker commuting during Project construction. Although the construction work hours would be 7:00 a.m. to 7:00 p.m., meaning construction workers would commute to and from the Project site outside of the typical peak commute periods (7:00 to 9:00 a.m., and 4:00 to 6:00 p.m.); the analysis conservatively assumes all construction workers would commute during the aforementioned peak traffic periods. It is expected that Project-generated truck trips, delivering materials and equipment, would be scheduled to occur during off-peak traffic hours, and the maximum number of truck trips would by 30 round trips (60 one-way trips) per day. Haul trucks would use dedicated truck routes within each jurisdiction, and would comply with all Caltrans permitting requirements when any truck loads are oversize. As described in Section 3.17.3, *Applicable Regulations Plans, and Standards*, Caltrans has the discretionary authority to issue special permits for the movement of vehicles and/or loads exceeding statutory limitations on the size, weight, and loading of vehicles contained in the California Vehicle Code. The California Highway Patrol is notified about transportation of oversize and/or overweight loads.

Assessment of the short-term effect that Project construction traffic could have on local and regional roads includes review of existing traffic volumes and consideration of both the increase that Project-generated construction traffic would contribute to existing traffic levels of service and the capacity of the road to handle the additional traffic. Although construction-related traffic would fluctuate throughout the entire construction period, due to scheduling of tasks and shifting workforce per Project component, the analysis focuses on the maximum Project-generated increase in traffic on the surrounding transportation network. Traffic conditions were examined under Year 2015 conditions in order to evaluate the extent to which the peak number of workforce traffic (expected to occur during months August through October of 2015) would affect the surrounding transportation network. In order to determine Year 2015 traffic conditions along I-10, projected traffic conditions were derived based on traffic volumes collected by Caltrans between 2004 and 2008 on I-10. An average annual growth rate of 1.3 percent per year was applied to the existing 2010 p.m. peak-hour traffic volumes; a.m. peak-hour traffic volumes were not increased.[1]

As shown in Table 4.17-1, the increase in traffic associated with the construction activities at the Project site would not change the Year 2015 LOS during the peak traffic periods along I-10, and these freeway segments would continue to operate at an acceptable LOS.

TABLE 4.17-1
YEAR 2015 AND YEAR 2015 PLUS PROJECT PEAK-HOUR TRAFFIC VOLUMES AND LEVEL OF SERVICE

Roadway/Segment	Travel Lanes	Capacity[a]	Year 2015 Conditions[b]		Year 2015 plus Project Conditions[c]	
			Volume	LOS	Volume	LOS
I-10 West of Mesa Drive	4	8,000	2,880	A	3,120	A
I-10 East of Mesa Drive	4	8,000	2,600	A	2,960	A

NOTES:
[a] Approximate two-way capacity in vehicles per hour (2,000 vehicles per hour per travel lane).
[b] Year 2015 traffic volumes without the added construction-related Project-related traffic.
[c] Year 2015 traffic volumes with the added construction-related Project-related traffic.

SOURCES: Caltrans, 2011; ESA, 2011.

Although construction traffic would be more noticeable on local roads (e.g., Mesa Drive and Black Rock Road), the increased traffic volumes would remain at levels less than the carrying capacity of those two-lane roads (which is about 10,000 to 15,000 vehicles per day). Because increases in traffic associated with the Project construction activities would not be substantial relative to Year 2015 conditions, the Project would not affect traffic conditions over the course of a workday.

Furthermore, as discussed above, I-10 has sufficient capacity to accommodate Project construction-related traffic while maintaining acceptable LOS during the peak-hour periods.

[1] Caltrans traffic counts indicate fluctuations in a.m. peak-hour traffic volumes on I-10 in the Project area, but that volumes in 2004 were approximately the same in 2008 (the last year that a traffic count was conducted, accordingly to Caltrans' web site at the time this analysis was prepared).

However, during these peak periods, the arrival of approximately 600 construction workers during a single hour could cause delays for workers at the stop-sign-controlled I-10 ramp / Mesa Drive intersection that could cause vehicles to queue back down the off-ramps onto the right lane of I-10. Because I-10 is a relatively low-volume interstate that operates at acceptable service levels (LOS A) and has two lanes in each direction, there would be adequate capacity in the I-10 left lane to allow vehicles to safely pass by any such potential back-up. In addition, the Applicant would require the staggering of worker arrival/departure times to reduce any conflicts with peak commute traffic; therefore, construction activities associated with the Project would not result in any potential adverse queuing effects on the I-10 off-ramps.

Construction of most of the planned facilities would not require closure of any travel lanes and therefore would not reduce the roadway capacity on roads that provide access to the work sites; however, installation of the gen-tie line, conductor stringing, installation of new poles, and construction of spur roads would require construction adjacent to existing roadways and possibly within existing roads on BLM-administered lands in the Project area. Although activities associated with construction of the gen-tie line would occur over a short period in each location as construction progresses along the alignment, roadways along or adjacent to the planned alignment may require temporary closures of travel lanes and reduce roadway capacities during installation. As a result, temporary lane closures due to the aforementioned activities would adversely affect traffic conditions along surrounding roadways.

With respect to construction effects on existing bus transit services, the short-term traffic increases that would primarily occur on I-10 and Mesa Drive (and possibly Hobson Way) during construction would not substantially disrupt transit service provided by PVVTA. There are no bicycle or pedestrian facilities that would be affected by Project construction activities, and the temporary increase in traffic would not reduce, disrupt, or eliminate access to existing bicycle and pedestrian facilities.

Operation and Maintenance

The Project would generate minimal traffic during the operation and maintenance period. Operation and maintenance activities would require approximately 20 permanent, full-time personnel who would be on-site during daytime work hours, Monday through Friday. It is expected that some personnel may be required to be present on-site 7 days a week in order to provide additional monitoring and support on an as-needed basis. During seasonal periods when panel washing would be required, temporary personnel would also be employed. Panel washing for each of the two operating units would occur up to two times per year; a total of up to four panel washing events per year. It is anticipated that each unit washing would require approximately 35 days to complete, or approximately 140 days per year in order to complete panel washing of the entire Project facility.

Operational personnel are anticipated to originate from the Blythe area (located east of the site) or areas closer to the Project (such as Mesa Verde and Nicholls Warm Springs) due to proximity, travel length, and travel time for a typical permanent employee traveling to and from the site. Furthermore, the analysis did not consider full-time workers to be commuting from areas farther than Blythe (e.g., Indio areas), as travel times would be 1 to 1.5 hours, on average. Therefore, all 20 operational and maintenance employees are expected to commute daily from east of the site.

Truck traffic during O&M activities would include delivery of materials and supplies as well as off-site shipments of wastes for disposal. Project operation and maintenance is expected to generate sanitary wastewater, non-hazardous wastes, and small quantities of hazardous wastes to be recycled off-site. Truck travel, as well as other non-employee site visits, would be minimal, as an estimated four trucks (eight one-way trips) would travel to and from the site per day. Furthermore, truck trips to and from the Project site during operational and maintenance activities are anticipated to occur during non-peak commute periods.

Operation and Maintenance Impacts

During operation and maintenance, the Project would require full-time employees to perform equipment inspection, testing, and repairs as well as other daily maintenance activities as necessary. Other maintenance activities would include sporadic, intermittent visits from other personnel and non-employees, including panel washing and on-site inspection during all energized electrical maintenance activities. Approximately 20 full-time staff would be required for daily O&M activities, which would generate up to 20 round trips (40 one-way trips) per day. Permanent staff would be expected to arrive and depart the Project during typical peak commute periods. Furthermore, the Project would generate a very small number of truck traffic during operation and maintenance activities, as described above.

Complete commercial operation of the Project and its components is anticipated to occur by 2016. Therefore, traffic conditions were examined under Year 2016 conditions in order to evaluate the extent to which peak operational traffic would affect the surrounding transportation network. Consistent with the assessment of Year 2015 conditions, described above, the same average annual growth rates were applied to existing volumes along I-10 in order to determine Year 2016 traffic volumes.

As shown in Table 4.17-2, the increase in traffic associated with the O&M activities at the Project site would not change the Year 2016 LOS during the peak traffic periods along I-10, and these freeway segments would continue to operate at an acceptable level of service. The increased traffic volumes along I-10 would remain at levels less than the carrying capacity and would not deteriorate peak-hour LOS conditions along the freeway. Furthermore, the minimal amount of traffic generated by the Project during O&M activities would not result in any adverse queuing effects along the I-10 off-ramps during the morning and afternoon peak commute period.

Because increases in traffic associated with the Project O&M activities would not be substantial relative to Year 2016 conditions, the Project would not adversely affect traffic conditions over the course of a workday. In addition, O&M activities associated with the Project would not result in the temporary or permanent closure of roads or travel lanes; therefore, there would be no reduction in roadway capacities during this period of activity. Lastly, the minimal amount of traffic generated by the Project would not interrupt, interfere, nor limit access to any transit, bicycle, and pedestrian facilities in proximity to the site.

TABLE 4.17-2
YEAR 2016 AND YEAR 2016 PLUS PROJECT PEAK-HOUR TRAFFIC VOLUMES AND LEVEL OF SERVICE

Roadway/Segment	Travel Lanes	Capacity[a]	Year 2016 Conditions[b]		Year 2016 plus Project Conditions[c,d]	
			Volume	LOS	Volume	LOS
I-10 West of Mesa Drive	4	8,000	2,920	A	2,940	A
I-10 East of Mesa Drive	4	8,000	2,600	A	2,600	A

NOTES:
[a] Approximate two-way capacity in vehicles per hour (2,000 vehicles per hour per travel lane).
[b] Year 2016 traffic volumes without the added operation-related Project traffic.
[c] Year 2016 traffic volumes with the added operation-related Project traffic; truck trips are not included.
[d] Analysis assumes all full-time personnel would originate east of the site and would travel west of the site along I-10.

SOURCES: Caltrans, 2011; ESA, 2011.

Decommissioning

As stated in Section 2.7, *Decommissioning and Reclamation*, the Project is anticipated to be operational during a 30-year period; if no permit is extended beyond the 30-year period, the Project would cease operation. All Project components would be decommissioned, and the site would be restored to pre-Project conditions. Decommissioning would require approximately 6,000 truck trips, a workforce of approximately 300 workers, and approximately 24 months to complete. Based on these estimates, the workforce traffic during decommissioning activities would generate up to 300 roundtrips (600 one-way trips) per day and approximately eight truck trips per day, spread throughout the course of the day and scheduled outside typical peak-hour commute periods.

Furthermore, decommissioning activities would include dismantling the gen-tie line, telecommunications lines, switchyard, and distribution lines; these activities would be phased and would require approximately 3 weeks to complete.

Decommissioning Impacts

Because the number of workers and trucks required during decommissioning activities of the Project and its components would be less than during the peak construction period in 2015 (described above), the increased traffic during decommissioning would have less of an effect on traffic conditions than during peak construction; traffic flow along I-10 would operate at acceptable conditions during decommissioning. Furthermore, the increase in vehicle trips by the workforce during decommissioning activities (half of the peak number of workers during construction activities) would not result in any adverse queuing effects along the I-10 off-ramps during the morning and afternoon peak commute periods.

Similar to construction activities of the Project, as described above, decommissioning of most of the Project facilities would not require closure of any travel lanes and therefore would not reduce the roadway capacity on roads that provide access to the work sites; however, decommissioning of the gen-tie line and removal of spur roads would require activities within or adjacent to existing roadways. Although various decommissioning activities would occur over a short period in each location as decommissioning progresses along the alignment; roadways along or adjacent to Project facilities may require temporary closures of travel lanes and reduce roadway capacities during installation. As a result, temporary lane closures due to the aforementioned activities would adversely affect traffic conditions along surrounding roadways.

The short-term traffic increases during Project decommissioning activities, which would occur primarily on I-10, Mesa Drive, and portions of Hobson Way, would not substantially disrupt transit service provided by PVVTA. The increase in traffic and potential travel lane closures due to temporary activities would not reduce, disrupt, or eliminate access to existing bicycle and pedestrian facilities, and decommissioning of the Project therefore would not interfere with bicycle and pedestrian activities.

4.17.4 Alternative 2: Reduced Acreage

4.17.4.1 Direct and Indirect Impacts

Because the Alternative 2 construction workforce would be the same as the Proposed Action, and daily haul trips estimated for the Proposed Action are based on a phased construction schedule in which Units 1 and 2 would not overlap, daily worker commute and haul truck trip volumes are anticipated to be the same for Alternative 2 as for the Proposed Action, and therefore would have the same effect on the LOS of roadways in the study area. Such trips would occur for up to 24 fewer months; however, during the construction period, this Alternative would have the same effects with respect to transportation and traffic as the Proposed Action.

Alternative 2’s operation and maintenance staff would consist of approximately 13 full-time personnel, which is fewer than the Proposed Action; therefore, it would result in fewer daily commute trips. Additionally, although trips related to panel washing would occur on approximately 70 days per year, daily trip distribution would be the same as the Proposed Action. Although Alternative 2 operation and maintenance traffic would be slightly reduced compared to the Proposed Action, there would be no substantial difference between the impacts of Alternative 2 and those of the Proposed Action.

Because Alternative 2’s decommissioning workforce and daily haul trips to remove decommissioned equipment and materials would be the same as the Proposed Action, daily worker commute and haul truck trip volumes are anticipated to be the same for Alternative 2 as for the Proposed Action. Therefore, Alternative 2 would have the same effect on the LOS of roadways in the study area. Such trips would occur over a shorter decommissioning period under Alternative 2; however, during the decommissioning period, this Alternative would have the same effects with respect to transportation and traffic as the Proposed Action.

4.17.5 Alternative 3: Reconfigured Gen-tie/Access Road Routes

4.17.5.1 Central Route

During construction, operation, maintenance, and decommissioning, the Central Route would result in the same number of workers traveling to and from the site from the same locations as would be necessary for the Eastern Route proposed as part of the Project. Therefore, commute-related traffic generated during each phase of this Alternative would have the same impacts as the Proposed Action.

The Central Route would be slightly shorter than the proposed gen-tie line and access road route. Consequently, materials hauling associated with construction and decommissioning of this Alternative would result in a slightly reduced number of total truck trips. However, the daily distribution of truck trips would be the same as the Proposed Action, although these trips may occur over a slightly shorter time period. Therefore, there would be no substantial difference between the Central Route and the gen-tie line and access road proposed for the Project.

4.17.5.2 Western Route

During construction, operation, maintenance, and decommissioning, the Western Route would result in approximately the same number of workers traveling to and from the site from the same locations as would be necessary for the gen-tie line and access road route included in the Proposed Action. Therefore, commute-related traffic generated during each phase of this Alternative would have the same impacts as the Proposed Action.

The Western Route would be slightly longer than the proposed gen-tie line, and would not require a separate access road. Consequently, materials hauling associated with construction and decommissioning of the Western Route would result in a slightly increased number of total truck trips. However, the daily distribution of truck trips would be the same as the Proposed Action, although these trips may occur over a slightly longer time period. Therefore, there would be no substantial difference between the Western Route and the Proposed Action.

4.17.6 Alternative 4: No Action Alternative

If Alternative 4 were implemented, no changes to existing transportation and traffic conditions would occur, and the existing environmental setting would be maintained.

4.17.7 Cumulative Impacts

4.17.7.1 Geographic Extent/Context

For the purposes of the cumulative analysis of transportation and traffic impacts, only other projects that make or would make a substantial contribution to traffic at the same roadway segments as the Proposed Action (e.g., within the I-10 corridor) are considered. Because the volume of traffic generated during construction and decommissioning would not be particularly large and would be substantially less during operation and maintenance activities, only segments of I-10 in proximity to the Project site would experience any appreciable increase in traffic. Therefore, the geographic scope for cumulative impacts consists of the immediate vicinity of the proposed Project site where other projects might contribute traffic to the same segments of I-10.

4.17.7.2 Temporal Scope

The temporal scope for cumulative traffic impacts includes the construction, operation, maintenance, and decommissioning phases of the Project, because each phase would contribute traffic to roadways within the geographic scope.

4.17.7.3 Analysis of Cumulative Effects

Past development near the Project area includes those projects listed in Table 4.1-3. All of the projects listed in Table 4.1-3 have been implemented and so would contribute ongoing operational traffic to area roadways during the Project's construction, operation, maintenance, and decommissioning phases. Traffic associated with these past projects already contributes to existing traffic on the road network and, therefore, is accounted for as part of baseline conditions for the Project evaluated in Section 4.17.3.1, *Direct and Indirect Impacts*. The West-wide §368 Energy Corridors (project 6 in Table 4.1-3) consist of a number of designated energy corridors, of which three are located in the immediate Project vicinity. The corridors themselves would not directly generate any traffic, though future energy projects that would use these corridors could add traffic to roads in the Project area if those projects were sited and constructed within the Project area. The Kaiser Mine (project 9 in Table 4.1-3) was closed in 1983 and therefore is outside of the temporal scope of the cumulative effects analysis. Therefore, these projects have not resulted in cumulatively adverse conditions because they do not conflict with established standards of performance of the vehicle circulation system in the area because the system is currently operating at acceptable LOS. In addition, past development has not been located such that or contained features that would adversely affect air travel.

Furthermore, the traffic analysis already accounted for traffic generated by these existing projects in the study's baseline data (Year 2015 to evaluate construction-related impacts and Year 2016 to evaluate operational-related impacts, respectively). The results of the traffic analysis demonstrate that the vehicular circulation would continue to operate acceptably and would not conflict with established standards of performance. Table 4.1-4 provides a list of reasonably foreseeable projects, including other proposed or approved renewable energy projects, various BLM-authorized actions/activities, proposed or approved projects within the County's jurisdiction, and other actions/activities that the Lead Agencies consider reasonably foreseeable. Table 4.1-4 lists foreseeable projects in the Project area, which is the I-10 corridor in eastern Riverside County. Projects D, I, M, N, X, and Y (see Figure 4.1-1) have the potential to affect the local road network. Additionally, all the projects listed in Table 4.1-4 would generate traffic along the I-10 corridor.

Construction

Cumulative impacts would be greatest if the peak construction period of all of these projects overlapped. Although this worst-case scenario is unlikely, even if it were to occur, it is unlikely that the LOS of the affected freeway segments would degrade to unacceptable service levels of LOS D or worse, which is the allowable limit in the Riverside County General Plan (Riverside County, 2009) because segments of I-10 near the Project site currently operate at LOS A. Additionally, as stated, Project-generated traffic during any phase would not be substantial enough to degrade freeway LOS to unacceptable conditions.

Cumulative impacts to segments of I-10 have been considered because it is likely that construction vehicle trips from foreseeable future projects and Project would have the greatest potential to combine cumulatively on I-10. It is likely that a portion of construction traffic, including worker and haul trucks, for all projects shown on Figure 4.1-1 would traverse the same portion of I-10 as Project construction-related traffic. Although the construction period, workforce, and schedule for the majority of foreseeable future projects are generally unknown, in a worst-case scenario where construction peak periods overlapped for all projects proposed in the Project area, the LOS of I-10 could be temporarily degraded, but likely would not be degraded below the acceptable LOS C, and would not result in any permanent LOS degradation. Levels of congestion (delay) at on- and off-ramps along I-10 could be adversely affected due to the temporary influx of construction-related traffic; however, even a worst-case scenario would not likely exceed the capacity of I-10, which in this area has two lanes in both directions to accommodate the anticipated increase in traffic while maintaining adequate traffic flow along the freeway mainline.

APM TRANS-1 would reduce the Project’s construction-related contribution to cumulative traffic impacts. Based on the short-term nature of construction, any increase in vehicle trips and transportation-related impacts would be temporary. However, even with implementation of the APMs during construction of the Project, implementation of a coordinated transportation management plan is recommended to reduce the Project’s contribution to any potential traffic impacts to the surrounding network. Implementation of Mitigation Measure TRN-2 would reduce potential cumulative traffic impacts.

Operation and Maintenance

Project operation and maintenance is estimated to generate a total of about 40 daily trips, with 20 trips during the a.m. peak hour and 20 trips during the p.m. peak hour. However, because operation and maintenance of the Project would generate substantially less traffic than construction or decommissioning activities, and because the construction phase of the Project would cause no adverse traffic impacts (as stated above), no adverse impacts would occur due to the traffic generated during the operation and maintenance phase of the Project.

Decommissioning

During the closure and decommissioning of the Project, it is unknown what would be the potential cumulative contribution of the Project to transportation and traffic impacts, as the number and proximity of cumulative projects in 30 years (expected life of the Project) is unknown. It is assumed that the analysis of cumulative construction impacts discussed above could occur during decommissioning, and that the mitigation measures implemented during construction activities also would be applicable to decommissioning activities.

4.17.8 Mitigation Measures

TRN-1: The Applicant and/or its contractor shall prepare and implement a traffic control plan to reduce construction- and decommissioning-related traffic impacts on the roadways at, and near the work site, as well as to reduce potential traffic safety hazards and ensure adequate access for emergency responders. The Applicant and/or its contractor shall coordinate development and implementation of this plan with the BLM and other jurisdictional agencies (e.g., Riverside County, City of Blythe, and Caltrans), as appropriate. To the extent applicable, the traffic control plan shall conform to Part 6 (Temporary Traffic Control) of the *California Manual on Uniform Traffic Control Devices* (Caltrans, 2010), and shall include, but not be limited to, the following elements:

1. Implementing circulation and detour plans to minimize impacts on local road circulation during temporary lane closures. Flaggers and/or signage shall be used to guide vehicles through and/or around the work zone.

2. Identifying truck routes designated by Riverside County and local jurisdictions. Haul routes that minimize truck traffic on local roadways shall be utilized to the extent possible.

3. Providing sufficient-sized staging areas for trucks accessing work zones to minimize disruption of access to adjacent public right-of-ways.

4. Controlling and monitoring worker vehicle movement through the enforcement of standard construction specifications by on-site inspectors.

5. Scheduling truck trips outside the peak morning and evening commute hours to the extent possible.

6. Limiting the duration of lane closures to the extent possible.

7. Storing all equipment and materials in designated contractor staging areas on or adjacent to the worksite, such that traffic obstruction is minimized.

8. Implementing roadside safety protocols. Advance “Road Work Ahead” warning and speed control signs (including those informing drivers of state-legislated double fines for speed infractions in a work zone) shall be posted to reduce speeds and provide safe traffic flow through the work zone.

9. Providing advance notification to administrators of police and fire stations (including fire protection agencies), ambulance service providers, and recreational facility managers of the timing, location, and duration of construction and decommissioning activities and the locations of detours and lane closures, where applicable. Maintain access for emergency vehicles within, and/or adjacent to, roadways affected by construction and decommissioning activities at all times.

10. Repairing and restoring adversely affected roadway pavements to their pre-construction condition.

TRN-2: Prior to construction, the Applicant shall develop a Coordinated Transportation Management Plan and work with the BLM and Riverside County to prepare and implement a transportation management plan for roadways adjacent to and directly affected by the planned

Project facilities, and to address the transportation impact of the multiple overlapping construction projects within the vicinity of the Project in the region. The transportation management plan shall include, but not be limited to, the following requirements:

1. Coordination of individual traffic control plans for Project and nearby projects.
2. Coordination between the contractor and Riverside County in developing circulation and detour plans that include safety features (e.g., signage and flaggers). The circulation and detour plans shall address:
    a. Full and partial roadways closures;
    b. Circulation and detour plans to include the use of signage and flagging to guide vehicles through and/or around the construction zone, as well as any temporary traffic control devices;
    c. Bicycle detour plans, where applicable;
    d. Parking along arterial and local roadways; and
    e. Haul routes for construction trucks and staging areas for instances when multiple trucks arrive at the work sites.
3. Protocols for updating the transportation management plan to account for delays or changes in the schedules of individual projects.

4.17.9 Residual Impacts after Mitigation Incorporated

Following the implementation of mitigation measures identified in Section 4.17.8, the amount of Project-generated traffic within the study area would not exceed thresholds and would not cause or contribute to adverse cumulative conditions.

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4.18 Utilities and Service Systems

4.18.1 Methodology for Analysis

Waste Handling

Projected wastes were evaluated in terms of landfill capacity and compliance with applicable laws, ordinances, regulations, and policies, for both solid wastes and wastewater. The state and local environmental requirements listed in Section 3.18, *Utilities and Service Systems*, have been established to ensure the safe and proper management of applicable wastes in order to protect human health and the environment.

Water Supply

To evaluate water availability, a water supply assessment was completed in support of the Project (AECOM, 2011). Water demands of the Project are discussed in Chapter 2, *Proposed Action and Alternatives*, with additional detail in Section 4.20, *Water Resources*. The Project's water demands were evaluated in comparison with the available water supply and historic regional water consumption levels.

Other Utilities and Services

Other utilities and services, including wastewater treatment, electricity, stormwater, and cell phone towers, were considered as discussed in Section 3.18, *Utilities and Service Systems*.

4.18.2 Applicant Proposed Measures

There are no APMs to address potential effects to utilities and service systems.

4.18.3 Alternative 1: Proposed Action

4.18.3.1 Direct and Indirect Impacts

Construction, Operation, and Maintenance

Construction, operation, and maintenance of the Project would result in the installation and operation of water supply, water treatment, wastewater treatment, and stormwater management facilities on site. These facilities would directly support the Project, and would not rely on, nor would they require, additional capacity or other support from off-site water supply, water treatment, or wastewater treatment facilities, including municipal or other regional facilities. Stormwater from the Project site would drain through drainage canals maintained by PVID. However, the Project would result in only very minor changes in stormwater flows emanating from the site. Therefore, the Project would not affect the operation or function of existing water supply, water treatment, wastewater treatment, or stormwater management facilities, and would not require the expansion or modification of such facilities. Additionally, these facilities would be installed and operated so as to maintain compliance with all applicable regulations, such that no regulatory conflict would occur with respect to the installation and use of these facilities.

Water Supply and Water Availability

Total construction period water demand is anticipated to be 750 AF over 46 months. Total operation period water demand is anticipated to be 16 to 23 AFY for Unit 1 and 15 to 22 AFY for Unit 2. Over the proposed 30-year operational period, total water demand would be between 930 and 1,350 AF. This amounts to a combined water demand of approximately 1,680 to 2,100 AF for construction and operation.

The most practical water supply option for the Project is groundwater pumped from the underlying aquifer. There is no industrial water purveyor in the area, no public water system with capacity to serve the Project, nor are there other water sources such as reclaimed water or surface waters that would not require entitlement. Furthermore, groundwater underlying the Project is not adjudicated.[1] Therefore, the Project's water needs would be met by on-site groundwater wells. The water system would be designed and constructed to meet just the needs of the Project, and would be classified by the CDPH as a non-community, non-transient water system because the Project's water system would provide water for use by on-site employees and to support solar plant operation and maintenance.

As discussed in Section 3.20, *Water Resources*, the PVMGB directly underlies the Project site and is hydrologically continuous with the PVVGB. Therefore, both basins are considered together in support of the water supply assessment, for the purposes of evaluating potential water supply availability. The two basins are collectively referred to as the Palo Verde Groundwater Basin (PVGB) throughout the remainder of this section. Additional information with respect to the composition of aquifers and depth to groundwater, as well as other parameters relevant to groundwater and aquifer physical properties, are discussed in Section 3.20, *Water Resources* and the water supply assessment (AECOM, 2011).

An overdraft assessment was completed in support of the water supply assessment. As indicated therein, the California DWR estimates that the total groundwater storage capacity in the PVGB is approximately 6,840,000 AF. Natural recharge in the PVMGB is estimated to be 800 AFY, with recharge by underflow from Chuckwalla Valley estimated to be about 400 AFY (DWR, 2004).

Basin groundwater balance was also evaluated in support of the water supply assessment. The water balance was developed for the PVGB (AECOM, 2011) based on numerous sources of information including: stream flow data from the Colorado River, PVID diversion and return data, and groundwater pumping estimates.

The water balance for the PVGB is documented in detail in Section 3.20, *Water Resources*. The water balance provided reflects the relative stability of the groundwater levels since the mid- to late 1980's. The observed stability reflects management of the diverted water from the Colorado River in support of irrigation, plus return of groundwater through PVID drains. Water levels have fluctuated only a few feet in response to irrigation, indicating a balance between inflow and outflow of groundwater within the PVGB. Overall, a water balance of 426,600 AF is estimated from a balance of recharge and discharge elements. Key elements of the groundwater balance for recharge include agricultural return and canal seepage. Together, these elements make up about

[1] In adjudicated groundwater basins, the groundwater rights of all overliers and appropriators are court-determined.

97 percent of the total recharge to the PVGB. The discharge or outflow of groundwater largely consists of the measured discharge from the drains, the unmeasured return or groundwater discharge to the river, and evapotranspiration loss from non-native vegetation along the river within the groundwater basin. These elements make up 97 percent of the total outflow, of which 84 percent discharges from the drains (AECOM, 2011).

The water supply assessment also included an evaluation of potential cumulative water supply impacts in order to evaluate the effects of groundwater withdrawal by multiple proposed renewable energy projects within the Palo Verde Valley. In addition to the Project, seven other renewable energy projects were identified in the Palo Verde Valley with a combined annual operational water requirement of about 4,200 AF (AECOM, 2011). The Project represents about 0.7 percent of the total combined annual operational water use (AECOM, 2011). Inclusive of both construction and operational water requirements through the end of Project O&M, the combined cumulative total water use from these projects is estimated to be about 131,000 AF. This represents about 2 percent of the 6,840,000 AF of estimated groundwater storage in the PVGB. The results of the research showing the proposed water use and pumping schedule for each of the projects are summarized in Section 4.20, *Water Resources*.

Project construction and operation would require a total of approximately 1,680 to 2,100 AF of water over the construction period plus the 30-year operation period. This volume of water represents about 0.02 percent of the total groundwater storage (6.84 million AF) reported by DWR for the PVGB. Therefore, potential effects on groundwater would be minimal over the life of the facility (AECOM, 2011).

Solid Waste

The Project would generate solid waste during construction, operation, and maintenance. All handling and processing of construction, demolition, and inert debris would be in accordance with applicable regulatory requirements as described in Section 2.3.1.3.10. Solid waste would include recyclable materials such as metals and plastics, as well as various construction materials and worker generated waste that would include a combination of recyclable and non-recyclable materials. Recyclable materials would be recycled as described in Tables 2-4, Summary of Construction Waste Streams and Management Methods and 2-5, Summary of Operation Waste Streams and Management Methods. Non-recyclable, non-hazardous solid waste materials would be landfilled in accordance with state and local regulations. All solid waste generated on site would be required to be removed at least once per week by the approved franchise hauler.

As discussed in Section 3.18, *Utilities and Service Systems*, landfills in Riverside County have a combined capacity available that is sufficient to support disposal for at least the next 15 years. The Blythe landfill, which is located closest to the Project, has sufficient capacity to continue to provide solid waste disposal through 2047. Therefore, sufficient capacity is anticipated to be available for waste disposal. Hazardous wastes are treated separately. Please refer to Section 4.9, *Hazards and Hazardous Materials* for additional discussion of hazardous wastes.

Electricity

Operation of the Project would result in the generation of electricity. Transmission of generated electricity would be facilitated by connection to a new 500 kV transmission line, DPV2. The transmission line has been approved but not yet constructed. However, it is anticipated that this transmission line would be sufficient to convey power from the Project, even in combination with other anticipated solar power projects along the I-10 corridor.

Decommissioning

Decommissioning of the Project would involve removal and/or abandonment in place of the water supply, water treatment, wastewater treatment, and stormwater facilities that are proposed. The removal of these facilities would not affect the operation or function of other water supply, water treatment, wastewater treatment, or stormwater management facilities that are located in the vicinity of the Project site. Decommissioning would result in the generation of additional solid waste. Anticipated solid waste flows include concrete, metal, plastics, and photovoltaic panels. Recyclable materials would be removed from the waste stream and recycled prior to disposal of solid waste in an approved landfill. Solar PV panels would be reused if possible and then recycled at the end of their useful life. Based on the CIWMP for Riverside County, it is anticipated that at least 15 years of capacity would be available in landfills, countywide, at the time of decommissioning. Also, based on current estimates, the Blythe Landfill would still have at least 10 years of remaining capacity available at the time of decommissioning. Therefore, sufficient capacity is anticipated to be available to support decommissioning.

4.18.4 Alternative 2: Reduced Acreage

4.18.4.1 Direct and Indirect Impacts

Construction, Operation and Maintenance

Construction, operation, and maintenance of Alternative 2 would result in the installation of similar water supply, water treatment, wastewater treatment, and stormwater management facilities on site, except that these facilities would be sized appropriately for Alternative 2. Similar to the Proposed Action, Alternative 2 would not result in or require alteration of off-site facilities in support of these functions. Similarly, water requirements for Alternative 2 would reflect reduced demand, in proportion to the reduced footprint area of Alternative 2 in comparison to the Proposed Action. Therefore, potential effects on water supply would be minor. The total volume of solid waste generated during construction, operation, and maintenance of Alternative 2 would be of similar composition to that discussed for the Proposed Action, but reduced in total volume, and therefore would have a reduced effect on available landfill capacity. Similar to the Proposed Action, waste disposal would comply with applicable laws. Finally, Alternative 2 would also be served by the anticipated 500 kV DPV2 transmission line, which would be sufficient to convey power from this Alternative.

Decommissioning

Decommissioning of Alternative 2 would be similar to that described for the Proposed Action, except that activities would be reduced in intensity, in proportion to the reduced size of Alternative 2. Alternative 2 would involve removal and/or abandonment in place of the water supply, water treatment, wastewater treatment, and stormwater facilities that are proposed, and would not affect the operation or function of other nearby facilities. Decommissioning would result in the generation of additional solid waste, but in reduced volumes in comparison to the Proposed Action. Recyclable materials would be removed prior to disposal in an approved landfill, and similar to the Proposed Action, it is anticipated that sufficient landfill capacity would be available at the time of decommissioning, and decommissioning-related effects would be minimal.

4.18.5 Alternative 3: Reconfigured Gen-tie/Access Road Routes

4.18.5.1 Central Route

The Central Route would cause the same types of impacts related to utilities and service systems as the Proposed Action. The Central Route would be slightly shorter than the proposed gen-tie line and access road route. Consequently, water consumption and solid waste generation associated with construction, operation, maintenance, and decommissioning of this Alternative would be slightly reduced compared to the Proposed Action. Nonetheless, there would be no substantial difference between the Central Route and the Proposed Action.

4.18.5.2 Western Route

The Western Route would cause the same types of impacts related to utilities and service systems as the Proposed Action. The Western Route would be slightly longer than the proposed gen-tie line and access road route. Consequently, water consumption and solid waste generation associated with construction, operation, maintenance, and decommissioning of this Alternative would be slightly increased compared to the Proposed Action. Nonetheless, there would be no substantial difference between the Western Route and the Proposed Action.

4.18.6 Alternative 4: No Action Alternative

Because the No Action Alternative would not result in increased water consumption, generate wastewater, or generate solid waste, it would have no impact on the capacity of utilities and service systems to serve demand.

4.18.7 Cumulative Impacts

The geographic scope of the cumulative impacts analysis for utilities and service systems includes the PVGB, the areas draining into PVID stormwater infrastructure, and the areas served by the Blythe Landfill. The temporal scope includes the construction, operation and maintenance, and decommissioning periods.

The cumulative analysis provided here considers implementation of the Project in combination with other past, present, and reasonably foreseeable future projects. Tables 4.1-3 and 4.1-4 provides a list of such projects along the I-10 corridor, which were considered in support of this analysis.

The Project would result in an impact with respect to stormwater drainage facilities. Similar situations are anticipated for the other projects considered because many of them drain into desert sinks. Where other projects could potentially affect downstream drainage facilities, it is anticipated that mitigation would be applied on a case-by-case basis, in order to avoid adverse effects.

With respect to water supply, as discussed previously, the Project would have a minor effect on groundwater storage in the PVGB. According to the water supply assessment prepared for in support of the Project, when considered in combination with other projects, given the fractional contribution of the Project to the total water use in the PVGB, the Project would not represent a noticeable contribution to the water resource impacts on the basin. Some of the projects considered in the cumulative analysis are located in other groundwater basins, for instance, within the Chuckwalla Valley Groundwater Basin. Because the Project is located downgradient of the Chuckwalla Valley Groundwater Basin, pumping in support of the Project is not anticipated to result in a noticeable contribution to changes in groundwater level in that basin.

Regarding landfill capacity, as discussed previously in this section and in Chapter 2, *Proposed Action and Alternatives*, it is anticipated that much of the solid waste generated from the Project would be recycled, including during decommissioning. It is presumed that other proposed projects would implement similar measures for waste reduction. In particular, similar to the Project, decommissioning wastes for other solar projects are anticipated to be largely recyclable, and recycling this waste would minimize impacts on landfills. Additionally, Riverside County landfills, including the Blythe Landfill, are anticipated to have sufficient capacity available through the foreseeable future. Therefore, while all of the projects, when considered together, would generate a larger volume of solid waste than the Project alone, the total volume of waste that would be landfilled is not expected to exceed the permitted capacity of available landfills.

Finally, with respect to operation of the existing electric utility transmission lines, the proposed 500 kV DPV2 transmission line has been designed so as to provide power transmission capacity to support the reasonably foreseeable projects within the I-10 corridor, including the Project.

4.18.8 Mitigation Measures

Implementation of the following mitigation measure would address potential impacts associated with utilities and service systems.

UTILITIES-1: In order to ensure that the selected reverse osmosis brine disposal method would not conflict with Colorado River RWQCB requirements or policies, the Applicant shall not use brine as a land-applied dust suppressant or apply brine to the ground for any other purpose.

4.18.9 Residual Impacts after Mitigation Incorporated

Residual impacts with respect to utilities and services include increased disposal volumes for solid waste during the lifetime of the Project, in comparison to the baseline, although such increases in solid waste disposal are anticipated to be manageable within available landfill capacities. Total water supply available in the PVGB would be reduced slightly as a result of Project implementation; however, it is likely that such reductions would not be noticeable at a distance of over 1 to 2 miles from the Project site. Finally, drainage conditions could be altered slightly as a result of Project implementation, such as slightly altered concentration times or flow regimes. However, as discussed previously, it is anticipated that existing infrastructure is sized sufficiently so as to be able to handle any anticipated variability in stormwater hydrology.

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4.19 Visual Resources

This section discusses effects on visual resources that would occur with implementation of the Proposed Action and alternatives, cumulative effects, and mitigation measures to reduce visual contrast. Overall, the MSEP would result in long-term visual alteration to approximately 4,496 acres of land, nearly all of which has been classified as B-Quality[1] scenery. One exception is approximately 5 miles of off-site linear facilities, south of I-10, which would be within land classified as C-Quality scenery. The land altered by the MSEP solar units is considered to have a moderate visual sensitivity, whereas off-site linear facilities located south of the southern border of the approved BSPP would occur on land classified as having a high visual sensitivity.

4.19.1 Methodology for Analysis

There are two forms of visual analysis associated with the Proposed Action. The first visual analysis is to determine administrative compliance of the proposed action or alternatives with the Interim VRM Classes. The second analysis is to determine the extent of visual impact or change from the existing condition that will result from the proposed action or alternatives.

Both analyses are achieved using the BLM Visual Resource Contrast Rating System (H-8431) which provides a method for systematically evaluating the visual contrast between a Proposed Action or alternatives and the existing landscape plus an assessment of ten human and environmental factors (distance, angle of observation, length of viewing time, size & scale, season of use, lighting conditions, recovery time, spatial relationships, atmospheric conditions, and motion). The results of the Visual Contrast Rating analysis provide a means for determining the cause of visual contrast that exceeds what is administratively allowable and information to describe how the land modification will change the existing visual landscape.

Visual contrast is a measure of divergence in the classic design elements of form, line, color, and texture, and applied to landscapes in accordance with the BLM's Handbook H-8431. Administrative compliance is found when the Proposed Action or an alternative meets or exceeds the allowable level of visual contrast set by the Interim VRM Class objectives. If the Proposed Action or alternatives are nonconforming, then mitigation measures sufficient to bring the design into compliance would need to be identified and implemented. If a project cannot be mitigated to meet the VRM Class objectives, then the application may be denied, or the proposal redesigned or relocated to meet the objective.

The assessment of visual contrast is distinct from conclusions of *visual impact* presented in this section. A measure of visual impact is evaluated in terms of changes to scenic quality, sensitivity levels, and visibility that would occur on the ground as a result of the development of the Proposed Action or alternatives.

1 Scenic quality is rated in three categories from A (most scenic) to C (least scenic). See Section 3.19 for a discussion of scenic quality ratings.

The MSEP is evaluated for conformance with the following VRM objectives:

> **VRM Class III:** The objective of this class is to ***partially retain*** the existing character of the landscape. The level of change to characteristic landscape should be ***moderate***. Management activities may attract attention but ***should not dominate the view of the casual observer***. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
>
> **VRM Class II (applies only to the gen-tie line corridor north of I-10 and south of the approved BSPP):** The objective of this class is to ***retain*** the existing character of the landscape. The level of change to characteristic landscape should be ***low***. Management activities may be seen, but ***must not attract the attention of the casual observer***. Any change must repeat the basic elements of form, line color and texture found in the predominant natural features of the characteristic landscape.

Since the overall VRM goal is to minimize visual impacts, mitigation measures are recommended for all adverse contrasts that could be reduced, even if the MSEP or alternatives meet VRM objectives (mitigation measures are listed in Section 4.19.8). In addition to permanent visual contrast created in the landscape, the MSEP is analyzed for adverse effects of lighting and glare, as well as temporary construction disturbances.

4.19.1.1 Visual Contrast Rating Process

The degree to which the MSEP adversely affects the visual quality of a landscape relates directly to the amount of visual contrast between it and the existing landscape character. The degree of contrast is measured by separating the landscape into major features (land, water, vegetation, structures) then assessing the contrast introduced by the Project in terms of the basic design elements of form,[2] line,[3] color, and texture. The contrast of the MSEP with landscape elements then is rated as none, weak, moderate, or strong, as defined in Table 4.19-1. The purpose of this method is to reveal elements and features that cause the greatest visual impact, and to guide efforts to reduce the visual impact of a proposed action or activity. This process is described in detail in Handbook H-8431-1, Visual Resource Contrast Rating (BLM, 1986), and documented using BLM Form 8400-4 (see Appendix F).

The criteria for visual contrast are aligned with the management objectives for each Interim VRM Class. For example, if a project results in a weak visual contrast, it is likely to be in conformance with Interim VRM Class II, whereas a project that results in a moderate contrast would likely be in conformance with VRM Class III objectives but would not conform to VRM Class II objectives.

[2] Contrast in form results from changes in the shape and mass of landforms or structures. The degree of change depends on how dissimilar the introduced forms are to those continuing to exist in the landscape.
[3] Contrasts in line results from changes in edge types and interruption or introduction of edges, bands, and silhouette lines. New lines may differ in their sub-elements (boldness, complexity, and orientation) from existing lines.

TABLE 4.19-1
VISUAL CONTRAST RATINGS

Degree of Contrast	Criteria	Consistent with…
None	The element contrast is not visible or perceived.	VRM Class I - IV
Weak	The element contrast can be seen but does not attract attention.	VRM Class II - IV
Moderate	The element contrast begins to attract attention and begins to dominate the characteristic landscape.	VRM Class III - IV
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape.	VRM Class IV only

SOURCE: BLM, 1986

4.19.1.2 Selection of Key Observation Points

The contrast rating is completed from the most critical viewpoints, or Key Observation Points (KOPs). The intent of establishing KOPs is to visualize the contrast created by the Proposed Action from locations most representative of how the public perceives the affected landscape. The "public" may include highway travelers, travelers on local roads, residents in surrounding interspersed private lands, OHV users, dispersed recreational users in surrounding wilderness areas, or users of BLM facilities, such as long-term visitor areas. The sensitivity of these diverse user groups to changes in the landscape are influenced by a number of factors, including how prominent the view of the Proposed Action is (in terms of scale, distance, and angle of observation), the frequency and duration that viewers are exposed to the view, and whether the viewer groups are aware of their surroundings (BLM, 1986). According to the BLM Rangers from the PSSCFO, OHV use in and around the MSEP site is minimal with not more than, conservatively, a few hundred visits in a year during the cool months (September through May). In addition, the Outdoor Recreation Planner for the PSSCFO has observed that visitation to the surrounding designated wilderness is generally very low, with visitation to the Big Maria Mountains Wilderness somewhat higher than in the Palen-McCoy Wilderness, due to its proximity to the more populated Colorado River Valley to the east, and the City of Blythe, to the south. In general, sightseeing and day use touring by locals is the predominant use pattern on the affected routes.

Based on the above factors and in consultation with BLM staff, seven KOPs (see Figure 3.19-2) were selected to evaluate the change of visual contrast between MSEP site's existing conditions and proposed altered conditions. No KOPs were selected in the surrounding BLM wilderness areas because accessibility is limited, the level of use is low, and the MSEP would be visible from only a small fraction of the wilderness lands (see Figure 3.19-2). However, KOP 3 is included to approximate the elevated angle of view that could be experienced by low numbers of dispersed recreational users accessing the Big Maria Mountains. The location and characteristics of each KOP are summarized in Table 4.19-2.

TABLE 4.19-2
KOP LOCATION AND CHARACTERISTICS

ID	Name	View of	View distance & direction	User type	Use and visual exposure description
KOP 1	Fairway Villas and Mesa Golf Community	Solar Plant Site and Gen-Tie Line	6 miles west	Local Motorists, Some Residences	Brief views by local motorists accessing housing, potentially long-duration views from several residences, low view angle, partially obscured
KOP 2	Midland LTVA	Solar Plant Site and Gen-Tie Line	5.6 miles southwest	Day-use Visitors/ Campers	Use of LTVA by day users, RVs, and campers from September through May. Long-duration views, low to slightly elevated view angle, mostly unobstructed but occasionally filtered by vegetation
KOP 3	Foot of the Big Maria Mountains	Solar Plant Site and Gen-Tie Line	8.2 miles southwest	Dispersed Backcountry Users, OHV Users	Very low amount of use by backcountry OHV users accessing Big Maria Mountains Wilderness, access is difficult, and requires hiking from OHV route, unobstructed and elevated view angle
KOP 4	BLM Kiosk at Midland and Arlington Mine Road	Solar Plant Site	8.4 miles south	Local Motorists, OHV Users	Low amount of use by OHVs, occasional truck traffic, slightly elevated view angle, partially obstructed by topography
KOP 5	Open OHV Route No. 661085	Solar Plant Site	3.6 miles south-southwest	OHV Users	Low amount of use by OHVs, slightly elevated view angle, partially obstructed by topography
KOP 6	Eastbound I-10	Gen-Tie Line	2.2 miles southeast	Motorists	Numerous travelers exposed to view for brief periods
KOP 7	Westbound I-10	Gen-Tie Line	1 mile southwest	Motorists	Numerous travelers exposed to view for brief periods

These KOPs were chosen to represent a mix of user types and viewer experiences. The visual contrast created by the MSEP is rated using simulations from each of these KOPs, and is used to represent the visual change experienced from different locations and viewer types.

4.19.1.3 Visual Simulations

KOP photos were taken using a Nikon D90, 52mm lens, with a resulting horizontal field of view ranging from approximately 50 to 80 degrees. Computer modeling and rendering techniques were performed by TetraTech Inc. to produce the simulated images of the views of the site as they would appear from each KOP after the completion of construction of both solar units under the Proposed Action. Existing topographic and engineering (ArcGIS and AutoCAD) data were utilized to construct 3D digital and photographic images at eye level height (5.5 feet) of the generation and linear facilities. These images were combined with the digital photography from each KOP to produce a complete computer-aided image of the energy generating facility and portions of the gen-tie line. The model typically then is blended into the photograph by overprinting lighting conditions and atmospheric haze. However, due to KOP distance and moderately hazy conditions, this step would have made the MSEP indistinguishable within many of the simulations. Therefore, the simulations presented in this section do not blend the model of the MSEP model into the photograph so as to approximate the view on a clear, haze-free day.

4.19.2 Applicant Proposed Measures

There are no APMs to address potential effects to visual resources.

4.19.3 Alternative 1: Proposed Action

The Proposed Action would convert approximately 4,496 acres of naturally appearing desert plain to an industrial facility characterized by complex geometric forms and lines and industrial surfaces that are dissimilar to the surrounding natural landscape character. Most of the developed area would be covered with solar PV panels. Solar PV employs glass panels that are designed to maximize absorption and minimize reflection to increase electricity production efficiency. To limit reflection, solar PV panels are constructed of dark, light-absorbing materials and covered with an anti-reflective coating. Today's panels reflect as little as 2 percent of the incoming sunlight depending on the angle of the sun and assuming use of anti-reflective coatings (FAA, 2010). An example of a solar PV development adjacent to Palo Verde College in the Project vicinity is shown in Figure 3.19-1b. This facility is much smaller in scale than the proposed MSEP, but it provides a scaled-down example of a solar PV field as it might appear in a foreground view.

The MSEP solar field would occupy most of the disturbed area (4,227 acres, or 94 percent of the total disturbed area), whereas electrical substations and transmission facilities, a switchyard, an O&M building, a water treatment area, and access roads would take up the rest of the disturbed area. Most of the facility, including the solar field, would be low-profile, and would not exceed 10 feet in height. Some of the ancillary facilities, located primarily on the southeast section of the solar field, would have greater heights. The proposed gen-tie line leading away from the main generation facility would be approximately 70 to 145 feet tall, depending on the location and local terrain, with final heights to be determined during detailed design. Approximate dimensions of proposed facilities are provided below:

Solar Field

a. *Solar field*: Linear arrays of PV modules 6 to 10 feet above grade, at a maximum

b. *Solar inverters*: Overhead shade would be 10 to 12 feet tall and the equipment enclosure, if used, would be up to approximately 35 feet long by 10 feet wide by 10 feet tall.

c. *Security fence*: Chain-link fence around the perimeter, 8 feet tall, with 3-strand barbed wire.

d. *Weather station*: One or more meteorological towers (aluminum lattice) up to approximately 30 feet tall.

Operations and Maintenance Area

a. *Operations and Maintenance Building*: A pre-engineered metal building approximately 17 feet high at its peak with a neutral-colored metal siding and roof.

b. *Lighting*: During construction, temporary service poles would be 18 feet tall. During operations, lighting would be affixed to O&M areas and security gates.

c. *Water Treatment*: A free-standing water treatment facility would be a pre-fabricated steel building on a concrete foundation with a maximum height of 17 feet.

d. *Water Storage*: Three cylindrical on-site water tanks ranging in height from 10 to 20 feet, and ranging from 9 to 26 feet in diameter.

Off-site Structures

a. *Gen-Tie Line*: Monopoles and/or H-frames approximately 70 to 145 feet tall and approximately 800 to 1,000 feet apart; transmission and telecommunication wires.

b. *Distribution Line*: Wooden poles approximately 50 feet high and approximately 150 feet apart; distribution wires.

Lighting requirements are discussed in detail in Chapter 2. During construction, lighting would be located in the construction trailer staging area, parking area, and around site security facilities and would be mounted on temporary service poles approximately 18 feet high. Lighting in other areas is not planned for construction activities; however, if required, it would be limited to the locations and amounts needed to ensure safety and would be focused downward, shielded, and directed toward the interior of the site. During operation and maintenance, lighting would be provided at the O&M building, Unit 1 and Unit 2 substations, site entrance, and switchyard. Exterior security lighting would be installed to provide for safe access to Project facilities as well as visual surveillance. All lighting would be kept to the minimum required for safety and security; sensors, motion detectors, and switches would be used to keep lighting turned off when not required, and all lights would be hooded and directed to minimize backscatter and off-site light.

4.19.3.1 Direct and Indirect Impacts

As discussed in Section 3.19, *Visual Resources,* the MSEP has been proposed in a topographically favorable location for at least two reasons. First, the MSEP would be constructed at a somewhat higher elevation relative to I-10, the Blythe Airport, and the northwestern fringes of the City of Blythe. This would result in a greater potential for intervening topography to diminish or shield views of the Project, and means that the MSEP solar field would not be visible at all from the Palo Verde Valley. Second, there are two subtle knolls along a southwest-trending line on to the south and east of the MSEP site. It is likely that these two subtle topographic rises would aid significantly in shielding the size and scale of the MSEP for areas to the south and southeast. The entire solar field is mostly shielded from view from the most highly traveled areas to the south, such as I-10 and Hobson Way; the only paved public roadway whose viewshed is exposed to unobstructed views of the MSEP solar field for a relatively long period of time is Midland Road. The MSEP solar array and portions of the gen-tie line would be visible in westerly views from Midland Road for a period of approximately 12 minutes, assuming a vehicle travel speed of 50 miles per hour.

As discussed above, the primary tool used to analyze visual impacts of the MSEP is BLM's visual contrast rating system, which was used to analyze the visual impacts of the project from seven KOPs. Figures 4.19-1 through 4.19-7 present both the existing (figures numbers followed by "a") and simulated (figures numbers followed by "b") conditions at each of the seven KOPs. Documentation of the visual contrast ratings (BLM Form 8400-4, Visual Contrast Rating Worksheet) is included in Appendix F, and summarized below in Table 4.19-3.

Overall, the proposed solar field would cause the greatest visual contrast in the character elements of line and color. From common public viewpoints, the facilities would be so distant that the form

**TABLE 4.19-3
VISUAL CONTRAST RATING SUMMARY**

ID	Name	Form	Line	Color	Texture	Contrast Summary
KOP 1	Fairway Villas Golf Community	None	Weak	Weak	None	Due to distance and screening elements, much of the visual contrast would be difficult to perceive. The gen-tie line would be visible, but so diminished in the scene that it would not attract attention. Background mountains and foreground elements would remain dominant in the scene. Hazy conditions would further mute the facility contrast.
KOP 2	Midland LTVA	None	Moderate	Moderate	Weak	A slightly superior angle of view would cause the solar field and some ancillary facilities to become visible as a narrow wedge. Color contrasts and sharp edge lines would have the greatest influence on the visual contrast of the facility. For LTVA users, the MSEP would begin to attract attention, but would not dominate the character of the landscape. Hazy conditions would further mute the facility contrast.
KOP 3	Foot of the Big Maria Mountains	Weak	Moderate	Moderate	Moderate	From the elevated vantage point of KOP 3, views of the valley floor would be large and less narrowly confined. From this distance, facility heights would still be insufficient to create an appreciable contrast in form with the flatness of the valley floor, but the shape and texture of the solar field would become more apparent relative to KOP 2. The entire site extent would be visible, and the visual change would possibly attract the attention of observers who are attuned to changes in the landscape, such as backcountry hikers seeking solitude and unconfined recreation. However, due to the distance, dark color, and narrow shape, the MSEP would not dominate the character of the landscape as the main focus is closer views of the valley floor, and the elongated, pyramidal mountainous backdrop. Hazy conditions would further mute the facility contrast.
KOP 4	BLM Kiosk at Midland and Arlington Mine Road	None	Moderate	Moderate	Weak	From this vantage point, the MSEP solar field would be partially visible, with the remainder being partially blocked by a subtle gain in foreground topography. For viewers travelling on the unpaved Arlington Mine Road, the visual contrast would be similar to that seen from KOP 2 for the same reasons. For OHV users and the occasional truck traffic on the road, the MSEP site would begin to attract attention, but would not dominate the character of the landscape. Hazy conditions would further mute the facility contrast.
KOP 5	Open OHV Route No. 661085	None	Weak	Weak	Weak	While this KOP is closest to the MSEP site, foreground topography would largely screen it from view due to the subtly undulating topography of the alluvial fans emanating from the McCoy Mountains. The MSEP solar site would be intermittently visible and large in apparent scale relative to the other KOPs due to shortened distance. Due to screening elements, much of the visual contrast would be difficult to perceive. Background mountains and foreground elements would remain dominant in the scene. Hazy conditions would further mute the facility contrast.

**TABLE 4.19-3 (Continued)
VISUAL CONTRAST RATING SUMMARY**

ID	Name	Form	Line	Color	Texture	Contrast Summary
KOP 6	Eastbound I-10	Weak	Weak	Weak	None	From eastbound I-10, travelers would be able to see the gen-tie line in southerly views as it parallels the highway in the distance. The presence of other transmission lines in the middleground would diminish slightly the contrast of the structures in the scene. For eastbound travelers, the increasing proximity of the McCoy Mountains in northerly views draws visual attention. Due to distance, the presence of other transmission facilities and a prominent visual feature in a different view direction, the MSEP gen-tie line would be seen but would not likely attract attention.
KOP 7	Westbound I-10	Weak	Weak	Weak	None	From westbound I-10, travelers would approach the MSEP gen-tie line crossing. Due to screening elements that include highway signs, woodland scrub trees and shrubs bordering the highway, travelers would likely notice the gen-tie crossing only briefly (i.e., less than a minute). The general presence of other transmission lines in the vicinity would diminish the contrast of the MSEP gen-tie line within the visual context of the highway corridor. While the gen tie line would be seen, it would not attract attention because other transmission lines cross the highway in other locations and foreground views of the poles and wire strings would be experienced very briefly.

and texture contrasts would be highly muted or unapparent. However, the large scale of the facility means that even from relatively distant viewpoints, such as KOPs 1, 2, 3, and 4, the MSEP solar field would create a visual contrast in color relative to the surrounding landscape, and the facility would create sharp edge contrasts that are straight and geometric, and uncharacteristic of the surrounding landscape. This is particularly true as the observer gains elevation relative to the MSEP site. For KOPs at the same or similar elevations, the low angle of view would greatly diminish the dominance and scale of the MSEP. This is due to perspective foreshortening, which reduces the apparent size of surfaces of areas or objects, when seen obliquely or at low viewing angles. The line contrasts from such viewpoints are less apparent because they are often coincident with the flat horizon line of the valley floor, although a moderate color contrast may still remain. As discussed in Section 4.19.1.3, the visual simulations (as well as the visual contrast ratings) were created assuming optimal atmospheric conditions.

During much of the year, the visual contrast of the facility would be further reduced because of diminished visibility caused by haze and dust, and (less frequently) by rain and clouds.

As documented in Appendix F, the MSEP would meet visual resource management objectives from all KOPs. For KOPs viewing landscapes rated VRM Class III, the degree of visual contrast would not exceed moderate, in keeping with the management objective. The visual impact of the facility from several of the KOPs would be noticed, and would possibly attract the attention of a casual observer, but would not be so severe as to dominate the visual character of the landscape. The only portion of the MSEP site that must meet a VRM Class II objective is the gen-tie line north of I-10 and south of the southern edge of the approved BSPP solar plant site. The visual contrast rating from KOP 7 (which views a small part of the gen-tie alignment north of I-10) demonstrates that the project would meet a VRM Class II management objective.

However, as travelers continue west on I-10, the presence of the gen-tie line may briefly result in nonconformance with VRM Class II management objectives. As gen-tie line monopoles and wire strings come into the foreground, and assuming that a 100-foot corridor would be cleared of vegetation to accommodate the gen-tie line, the degree of visual contrast in northerly or northwesterly views may briefly be moderate because the development could attract visual attention. In the westbound direction, the southern tip of the McCoy Mountains begins to come into middleground views. In the context of the flat Chuckwalla Valley, it is a visually prominent feature. As the southern tip of the mountain approaches, its colors, textures, and form become visible in greater detail, and vehicle passengers observing the landscape are likely to focus on the northwesterly view. These observers may be briefly distracted (i.e., a period of seconds) by the visual contrast created in foreground views of the gen-tie line corridor. VRM Class II allows for only weak visual contrasts in the landscape, therefore visual contrast caused by the gen-tie line and the cleared corridor from I-10 would briefly violate the applicable VRM objective.

Despite the size and scale of the MSEP as a whole, the presence of topographic screening, the relative distance of paved public roadways, and because the public mostly would experience views of the MSEP from low viewing angles, the degree of visual contrast within the landscape would generally be moderate or less. There are no KOPs from which the MSEP site would visually dominate the landscape character (i.e., have a strong visual contrast). As discussed above, the purpose of BLM’s visual contrast rating system is to reveal elements and features that cause the greatest visual impact, and to guide efforts to reduce the visual impact of a Proposed Action or activity. Even though the MSEP would meet visual resource management objectives from all KOPs, it would still have a moderate visual contrast that must be reduced to the greatest extent possible. Further, the visual contrast that would be caused by the gen-tie line in close proximity to I-10 must be reduced in an effort to meet VRM Class II objective in the landscape north of the highway. As reflected in the contrast ratings, because the MSEP would create the greatest contrast with the landscape character elements of color and line, mitigation measures should prioritize the reduction of color and line contrasts (e.g., minimize reflective surfaces, use compatible colors in facility surface treatments, feather vegetation edges, and take advantage of natural gaps in vegetation, etc.). Mitigation measures targeted in such a way will be the most effective in reducing the overall level of contrast caused by the MSEP.

In order to reduce the visual contrast caused by the design and layout of the MSEP, as proposed, during its operating lifetime, Mitigation Measure VIS-1, Project Design, Building, and Structural Materials, shall be implemented. Mitigation Measure VIS-1 contains a number of methods to reduce the level of contrast of the MSEP within the landscape. Most are focused on reducing color and/or line contrasts of MSEP facilities, and in particular, the off-site linear facilities. The measures to reduce line contrasts (such as feathering the edges of graded or cleared ground) would be most effective in reducing the visual contrast of the MSEP from relatively close-range views of the off-site linear corridors, or from vantage points that are sufficiently elevated to allow a viewer to discern the shape or outline of the MSEP. The layout of the MSEP would be such that its western edge would follow to some degree natural landscape patterns, since the western edge of the solar field has been designed to avoid major drainages, in keeping with APM HYDRO-1 (Protection of Jurisdictional Washes). The preservation of washes also preserves the natural vegetation lines in the landscape created by desert wash woodland. Measures to reduce color contrasts (including glare), in combination, are likely to reduce the visual contrast of the MSEP to varying degrees from nearly all vantage points. In particular, color treating cleared ground or graveled surfaces, taking advantage of natural clearances, and feathering edges is likely to reduce the visual contrast of the gen-tie line north of I-10 to weak, thereby resulting in conformance with the VRM Class II objective.

The ability of the measures to reduce the severity of visual impacts from the various KOPs analyzed above would be limited by the apparent size and scale of the MSEP as viewed from a distance. For vantage points that are distant from the MSEP and are at similar elevations (such as KOPs 1, 2, 4, and 5), Mitigation Measure VIS-1 would reduce the visual contrast slightly, but not to such a degree as to change the visual contrast rating for any of the elements rated in Table 4.19-3. However, for low numbers of dispersed recreational users (i.e., OHV users and backcountry hikers seeking solitude and unconfined recreation) who would experience either close-range or high-angle views of Project facilities (such as KOP 3), Mitigation Measure VIS-1 would be sufficient to reduce both color and line contrasts such that one or both of the contrast ratings could decrease from moderate to weak depending on site-specific viewing conditions. Overall, very few of the identified impacts would be altogether eliminated through application of the proposed measures; however, the contrast in color and texture would be noticeably reduced from several of the KOPs, as well as for OHV users who would experience close-range views of the MSEP solar field, and backcountry recreationalists who would experience high-angle views of the site from surrounding mountains and BLM wilderness.

With mitigation, and accounting for viewer specific conditions (such as view duration, viewer expectations, visual contrast, and view exposure), the MSEP would have a moderate adverse visual impact for motorists on Midland Road, users of the Midland LTVA, and residential communities on the southern edge of the mesa. Users of OHV routes on the Palo Verde Mesa and dispersed users of the surrounding mountains seeking solitude and unconfined recreation could experience a moderate adverse visual impact due to their increased sensitivity and their ability to gain access to high-angle, relatively proximal, and unencumbered views of the MSEP. Due to the short amount of time the gen-tie line would be visible in the foreground on I-10, and the implementation of Mitigation Measure VIS-1, the MSEP would have a minor adverse impact for travelers on I-10.

The following analysis discusses the visual effects of the three phases of the MSEP that have not been otherwise addressed above, as well as additional mitigation measure proposed to reduce visual contrasts.

Construction

During the construction period, earth-moving activities and construction materials, equipment, trucks, and parked vehicles, all could be visible on the site and along the gen-tie line ROW. Construction would occur over 46 consecutive months, during which a number of activities would take place, including large-scale vegetation removal, earthwork, as well as foundation and equipment installation. These construction activities could result in a degree of visual contrast within the landscape that is greater than the operations and maintenance phase discussed above for each KOP. This is because the color of the underlying earth (light tan) stands in greater contrast within the landscape than the dark grey/black, non-reflective surfaces of the solar panels that would be installed. However, the overall degree of visual impact would be somewhat lessened because the area covered by any one phase of construction would be smaller compared to full build-out of the MSEP, and the visual effects would be temporary.

Visual effects of construction could also include the generation of large quantities of airborne dust as well as nighttime construction lighting. The affected viewers would be motorists on I-10 (for construction of the gen-tie line), a moderate number of residences at the Mesa Bluffs and Fairway Villas Golf Community, visitors of the LTVA, and dispersed recreational users. Although the construction period is estimated to be close to 4 years, construction would be phased, so that it would not occur in any one place for the entire period. Further, construction activities would be conducted in a manner that minimizes dust emissions, including visible dust, as described in APMs AIR-1 and AIR-2. These measures would include limiting the speed of vehicles, surfacing construction access roads, and controlling wind erosion on soil stockpiles and exposed earth. When nighttime construction activities take place, illumination would be provided that meets state and federal worker safety regulations.

To the extent possible, the nighttime construction lighting would be directed downward or toward the area to be illuminated and would incorporate fixture hooding/shielding, as described in Chapter 2. Task-specific lighting would be used to the extent practical while complying with worker safety regulations. Disturbed areas that would not be needed during operation and maintenance of the MSEP would be revegetated according to Mitigation Measure VIS-2. Finally, earthwork and vegetation manipulation strategies in Mitigation Measure VIS-1 and VIS-2 would assist in toning down the contrast created in earth-moving and vegetation clearing. Adverse visual effects associated with generation of large quantities of airborne dust as well as nighttime lighting during the construction period activities at both the solar field and along linear routes would be reduced with the implementation of Mitigation Measures AIR-1, AIR-2, VIS-1, and VIS-2. The general visual contrast created by vegetation stripping and the presence of construction materials, equipment and partially constructed facilities would contribute to the visual contrast apparent in the landscape, which is addressed in the previous section from the perspective of seven KOPs.

Operation and Maintenance

During the operation of the Project, visual effects would be caused by the visible elements of the MSEP, as described above. The discussion below focuses on the visual effects that are not captured by visual simulations (nighttime lighting and reflected sunlight/glare), or that are unique to the operation and maintenance phase. In addition, because visual design measures may degrade over time, and in some circumstances, would require monitoring and maintenance, Mitigation Measure VIS-3 is included to ensure the visual mitigation measures are maintained properly over the life of the Project.

Light and Glare (all KOPs)

While the potential for glint or glare and nighttime lighting is a component of visual contrast, these issues are treated separately because the simulations used in the visual contrast rating process model the daytime visual change, and do not consider the effect of temporary glare.

Operational Lighting. MSEP operations would require on-site nighttime lighting for safety and security as discussed previously and in Chapter 2. These light sources would be concentrated in a relatively small 10-acre area on the southeastern corner of the MSEP site, or approximately 0.25 percent of the MSEP solar field as a whole. Under normal circumstances, the MSEP solar field would not be illuminated. While the level of light generated by the MSEP is expected to be low, especially from the most common public viewpoints, the MSEP would nevertheless be in an area with very few existing structures, and the use of uncontrolled or excessive lighting could be noticed by nearby motorists on Midland Road, residents of the Mesa Bluffs and Fairway Villa Golf Communities, and could affect the nighttime experience for users of the Midland LTVA.

As described in Mitigation Measure VIS-1, a lighting plan will be prepared that documents how lighting will be designed and installed to minimize night-sky impacts during facility construction and operations. The lighting plan will include numerous measures to prevent unnecessary use of lights, minimize light intensity, and prevent light spillage and reflectance to off-site areas. The implementation of these measures would minimize the amount of lighting potentially visible off-site to the extent feasible. While these measures would not totally eliminate the light visible by surrounding user groups, facility lighting would be minimized and controlled such that it would not be a nuisance and would not detract from the ability for affected viewers to enjoy their surroundings or view the night sky. Existing light sources described in Section 3.19, *Visual Resources*, such as the Blythe Airport and areas to the south, would remain the dominant and most noticeable existing sources of light within the affected viewsheds.

Glint and Glare from the MSEP facilities. Unlike large fields of parabolic mirrors, which have been known to produce fairly intense glint[4] and glare[5] at various times of the day, the use of PV technology is generally regarded as causing minimal glint and glare impacts. As described above, solar PV employs glass panels that are designed to minimize reflection and reflect as little as 2 percent of the incoming sunlight (FAA, 2010). Nevertheless, some glare is possible from the surface of the PV panels and other MSEP components (especially metallic components) that reflect light depending on panel orientation, sun angle, viewing angle, viewing distance, and other factors. For example, Sullivan et al. (2010 as cited in DOI, 2010) observed glare from a slightly elevated viewpoint at a distance of approximately 2 miles from panels and ancillary components at a partially built PV facility in Nevada. Even though the panels to be used would be a uniform black color, from certain angles and times of day, the panels may appear grey or silvery white due to glare (Sullivan et al., 2010 as cited in DOI, 2010).

4 A flash of light, also known as a specular reflection, produced as a direct reflection of the sun in the parabolic mirror surface.
5 A continuous source of excessive brightness, relative to ambient lighting, also known as diffused reflections.

Potentially affected observers would be travelers on I-10 (for the gen-tie lines) and Midland Road (for the solar field), users of nearby OHV routes, and visitors to the McCoy or Big Maria Mountains or the Midland LTVA. It is possible that back reflected light or light not absorbed by MSEP facilities could produce minor glare, particularly when the viewer is positioned in line with the sun. This glare could occur in any one place for several hours (e.g., a sunny afternoon) but is unlikely to be visually distracting or nuisance causing. It is possible, however, that glare produced by the MSEP would be more intense than any other natural or cultural features in an observer's perspective. Glare produced by diffuse reflections would increase the color contrast of the MSEP in the landscape, but would not be sufficiently intense or distracting as to increase any of the contrast ratings in Table 4.19-3 to "strong."

Several measures are available that would reduce the potential for and frequency of glare from the solar fields. Mitigation Measure VIS-1 would require reflective surfaces be painted or treated so long as it would not impair proper function of the equipment or structure, and would require the use of nonspecular conductors and nonreflective coatings along the gen-tie line. Further, Mitigation Measure VIS-3 would ensure that surface treatments are maintained during operation and maintenance so as to prevent degradation of colored or treated surfaces. These mitigation measures would reduce the extent of reflective surfaces within the solar fields and gen-tie line, but would not prevent spread reflections off the face of the solar panels. Therefore, the color contrast of the solar panels during certain times of the day when the viewer is positioned in line with the sun would momentarily increase, but not to such an extent as to result in a change in the severity of the contrast rating in Table 4.19-3.

Decommissioning

Decommissioning would remove MSEP-related structures and infrastructure so that affected lands could naturalize. However, until vegetative restoration is achieved, adverse visual impacts would be similar to those described in the construction-phase impacts, because large areas would be devoid of desert scrub vegetation. Visual effects from the proposed gen-tie lines would be likely to remain, however, since it seems likely that, once in use, such lines would remain in use regardless of whether the energy they transfer is generated by the MSEP or another project. Implementation of VIS-1 and VIS-4 would aid greatly in reducing the visual effects of decommissioning. VIS-4 would require the Decommissioning and Site Reclamation Plan to include reclamation of the area of disturbed soils used for laydown, project construction, and siting of the other ancillary operation and support structures. Further, VIS-4 would reduce the amount of disturbed area and blend the disturbed areas into the characteristic landscape. It would require replacement of soil, brush, rocks, and natural debris over disturbed areas. Newly introduce plant species would be of a form, color, and texture that blends with the landscape. These measures would ensure the visual impacts of decommissioning are minor and short-term.

Impacts to Special Designations (Wilderness Areas)

Figures 3.19-2 and 3.16-1 show designated wilderness areas and areas of wilderness characteristics in the vicinity of the Proposed Action. While views of the MSEP would generally be from elevated viewpoints similar to KOP 3, the areas of the Big Maria Mountains Wilderness from which the MSEP could be seen would be located a greater distance away, somewhat diminishing the portion of views occupied by the MSEP.

The Palen-McCoy Wilderness is approximately 3 miles northwest of the MSEP site boundary. Approximately 1,698 acres or less that 1 percent of the Palen-McCoy Wilderness is within the MSEP viewshed. These areas are generally elevated with a favorable topographic orientation. Views from the Palen-McCoy Wilderness (and other locations on the eastern face of the McCoy Mountains) would be high-angle and relatively proximal to the Project and it is likely that the MSEP would result in a strong degree of contrast from these vantage points (i.e., it would demand attention, would not be overlooked, and would dominate the landscape). However, these vantage points are not appropriate as representative public viewpoints (KOPs) because as discussed in Section 4.19.1.2, visitorship to this wilderness area is very low and access to viewpoints are from scarcely traveled routes. In addition, the MSEP is unseen from the vast majority of wilderness land due to intervening mountain ranges (such as the McCoy and Little Maria Mountains). For these reasons, impacts would be moderate.

The Big Maria Mountains Wilderness and Rice Wilderness are located approximately 7 miles to the northeast, and 16 miles to the north of the MSEP site boundary, respectively. Approximately 5,556 acres or 12 percent of the Big Maria Mountains Wilderness and about 831 acres or 2 percent of the Rice Wilderness are within the MSEP viewshed. Users of these areas would be able to view the MSEP, but opportunities for solitude and unconfined recreation would not be greatly affected due to the small fraction of the wilderness area from which the MSEP could be seen and the distance of the MSEP from the wilderness area. Where visible, the MSEP area would constitute a small portion of the views, which would be open, unobstructed, and dominated by natural landscape features (e.g., mountain ranges, broad valleys, open sky). For these reasons, impacts would be minor.

The Little Chuckwalla Mountains Wilderness is located 14 miles to the southwest of the MSEP site boundary. Because of intervening topography, only the off-site linear facilities of the MSEP would be visible from the Little Chuckwalla Mountains Wilderness. At such great distances, the linear alignment would be barely noticeable and would only be visible from a small fraction of the total wilderness area. For these reasons, adverse effects would be minor.

4.19.4 Alternative 2: Reduced Acreage

4.19.4.1 Direct and Indirect Impacts

The direct and indirect impacts of the Reduced Acreage Alternative are similar or the same as the impacts of the Proposed Action, although the size of the facility and the duration of construction activities would be reduced. The area occupied by MSEP solar field would be reduced by approximately 50 percent, resulting in a reduction in the degree of visual change apparent from KOPs 1 through 5. The degree to which the visible extent of the MSEP under Alternative 2 would be reduced would depend on viewing relationships. Due to the low angle of view, a reduction in the disturbance area of Alternative 2 may be less perceptible from KOPs located east of the MSEP solar field (KOPs 1 and 2) than those located to the north and northeast (KOPs 3 through 5). Because the

MSEP solar field is viewed side-on from KOPs 1 and 2, eliminating its western half would have a minor effect on the extent of the horizon line occupied by the MSEP. On the other hand, the visible extent of the MSEP solar field would be noticeably reduced for viewpoints to the north (KOPs 4 and 5), and those that are sufficiently elevated to perceive the size and shape of the solar field (KOP 3). The visual contrast ratings presented in Table 4.19-3 would not change for KOPs 1 and 2, but would be reduced from moderate to weak for KOPs 3 and 4, and would be eliminated from KOP 5. For low numbers of dispersed recreational users in the surrounding mountains, the Alternative 2 would reduce the degree of visual contrast from strong to moderate levels because the apparent size of the facility would be cut in half. Because the location of the gen-tie line would not change, all impacts regarding views of the gen-tie line would be identical to those of the Proposed Action. In addition, because the size of the O&M area and the need for security lighting would remain the same under Alternative 2, impacts related to light and glare would be the same or similar compared to the Proposed Action. All mitigation measures identified for the Proposed Action would result in a similar degree of reduction in the apparent visual contrast caused by Alternative 2.

Construction

Because the construction duration under Alternative 2 would be reduced, the visual impacts that are unique to the construction phase (grading, fugitive dust, construction-related lighting, etc.) would be the same in type and intensity, but would be reduced in duration and geographic extent.

Operation and Maintenance

As discussed above, the visual impact of operation and maintenance would be reduced relative to Alternative 1, particularly from KOPs 3 through 5, and for dispersed recreational users in the surrounding wilderness.

Decommissioning

The visual impact of decommissioning activities for Alternative 2 would be similar or the same as the construction phase of this alternative.

4.19.5 Alternative 3: Reconfigured Gen-tie/Access Road Routes

4.19.5.1 Central Route

Direct and Indirect Impacts

The portion of the Central Route that deviates from the gen-tie line analyzed under Alternative 1 would be visible only from KOPs 1 and 2. In addition, the Central Route would cross I-10 in the same location as Alternative 1. Consequently, all other visual impacts discussed under Alternative 1 would be the same for Alternative 3. From KOPs 1 and 2, the gen-tie line would appear more distant and, therefore, would be even less noticeable. The visual contrast from KOPs 1 and 2 is predominantly caused by the MSEP solar field rather than the gen-tie route. Although it would be visible, it would be subordinate to other features in the view and have a minimal influence on the visual contrast of the Project compared to the solar field. Therefore, the visual impacts of construction, operation, maintenance, and decommissioning of Alternative 3 would be substantially the same as the impacts of Alternative 1.

4.19.5.2 Western Route

Direct and Indirect Impacts

The direct and indirect impacts for the Western Route would be the same as those of the Central Route, except that the Central Route would be located even further from KOPs 1 and 2, thereby reducing further the visibility of the gen-tie route. However, because MSEP solar field is the dominant factor in the visual contrast, the visual impacts of construction, operation, maintenance, and decommissioning of Alternative 3 would be substantially the same as Alternative 1.

4.19.6 Alternative 4: No Action Alternative

Under this Alternative, the visual appearance of the site would not change noticeably from existing conditions. The No Action Alternative would cause no change relative to baseline conditions and would not result in the visual impacts described for Alternative 1.

4.19.7 Cumulative Impacts

Impacts resulting from construction, operation, maintenance, and decommissioning of the MSEP could result in a cumulative effect on visual resources in combination with other past, present, or reasonably foreseeable future actions. The geographic scope of the cumulative effects analysis for visual resources consists of the viewshed of the I-10 corridor (where visual impacts could be synergistic), and locations from which a viewer could see the Proposed Action along with views of other projects (where visual impacts could be additive). Potential cumulative effects on visual resources could occur during the MSEP's proposed 46-month construction period (e.g., from cumulative construction disturbances), during the 30-year term of the authorizations and permits for the Proposed Action (e.g., project contrast with the landscape, glint and glare), or result from closure and decommissioning (e.g., until restoration efforts return the landscape to its original condition). Cumulative visual impacts could occur as long as the MSEP contributes to visual changes to the landscape that are visible or perceived by the public, either within the same viewpoints, or as a noticeable element in a cumulative viewing experience (i.e., an OHV travel route, a drive on I-10, or a local road).

Existing conditions within the area of cumulative effects analysis reflect a combination of the natural condition and the effects of past actions and are described in Chapter 3. Direct and indirect effects of the MSEP are analyzed above. Past, present, and reasonably foreseeable future actions making up the cumulative scenario are identified in Section 4.1. Among them, projects such as the Blythe, enXco McCoy, Gypsum, Genesis, Rice, Palen, and Desert Sunlight solar power projects, as well as numerous solar projects proposed on lands under County jurisdiction are expected to result in synergistic visual impacts for travelers along I-10, as well as additive visual impacts to dispersed recreational users on BLM lands on the Palo Verde Mesa and local roads, such as Midland Road. The analysis of the proposed Project generally found that the visual contrast of the MSEP would not exceed moderate levels from any of the representative public viewpoints. The degree of visual contrast caused by the MSEP solar field as experienced from Midland Road, OHV routes and a residential community on the Palo Verde Mesa ranged from “none” to “moderate.” The visual contrast from the eastern faces of the McCoy Mountains and a small fraction of the Palen-McCoy Wilderness would be “strong” but would have a moderate impact to the viewing public due to low visitorship and/or use. The visual contrast due to the gen-tie line experienced from I-10 would be briefly moderate at the gen-tie line crossing, and minor along other portions of I-10. Implementation of mitigation measures in Section 4.19.8 would bring the MSEP project into conformance with VRM objectives from all of the KOPs analyzed in Section 4.19.4.

The cumulative scenario for visual resource impacts, especially the viewshed impacts of utility-scale solar energy projects, has been evaluated in detail in the Final Solar PEIS issued in July 2012 (BLM and DOE, 2012). In that analysis, the specific solar technologies to be employed and the locations to be developed are not known precisely, but the visual impact analysis of the Riverside East Solar Energy Zone (SEZ) provides a useful approximation of the likely cumulative impact to be expected should all projects listed in Section 4.1 be developed. The projects in the cumulative scenario located on and adjacent to the Palo Verde Mesa as well as south of I-10 and west of Blythe are generally coincident with the SEZs analyzed in the Solar PEIS.

Because of the large size of the SEZ, the area’s topography, and the general lack of screening vegetation, the viewshed of the Riverside East SEZ is enormous. Within 25 miles of the SEZ, utility scale solar energy projects theoretically could be visible within an area of more than 2,100,000 acres (DOI, 2010). The viewshed includes large portions of the mountain ranges surrounding the Chuckwalla Valley and some neighboring valleys, including Ward and Rice Valleys, and the Pinto Basin. The affected lands that are common to both the MSEP and the Riverside East SEZ include I-10 and sensitive visual resource areas including the Palen-McCoy Wilderness, the Big Maria Mountains Wilderness, and the Rice Wilderness. The MSEP’s viewshed is wholly encompassed by the viewshed of the Riverside East SEZ. While no projects in the cumulative scenario would result in direct visual disturbance to landscapes within designated wilderness, due to their elevated position solar energy developments would be visible in part or in whole from significant areas of land within designated wilderness, as shown in Table 4.19-4.

TABLE 4.19-4
CUMULATIVE VIEWSHED IMPACTS ON DESIGNATED WILDERNESS AREAS

Designated Wilderness Area (WA)	MSEP viewshed within WA	Riverside East SEZ viewshed within WA (25-mile radius)	Percent of WA within SEZ viewshed	Percent of WA within MSEP viewshed
Big Maria Mountains (46,056 acres)	5,556 acres	8,873 acres	19 percent	12 percent
Palen-McCoy (224,414 acres)	1,698 acres	170,666 acres	76 percent	< 1 percent
Rice Valley (43,412 acres)	831 acres	35,773 acres	82 percent	2 percent

The main conclusion reached in the visual analysis of the SEZ is that visually complex, man-made industrial landscapes would contrast greatly with the surrounding generally naturally appearing lands. Large visual impacts on the SEZ and surrounding lands within the SEZ viewshed would be associated with solar energy development due to major modification of the character of the existing landscape. This conclusion indicates that the cumulative scenario would result in a visual impact that is inconsistent with the Interim VRM objectives that have been established in the MSEP area as described in Section 3.19.1.7 (VRM Class II and/or III). The analysis in the Solar PEIS also indicates that the most effective mitigation measures would be proper facility siting and layout, and that other mitigation measures addressing facility color and/or edge contrasts, due mostly to the size and scale of the foreseeable developments, would have a limited ability to appreciably reduce visual impacts from highly exposed areas.

In summary, the large-scale, closely spaced nature of projects in the cumulative scenario, in addition to the fact that some technologies, such as that proposed for the Rio Mesa Solar Project, would construct solar power towers approximately 760 feet tall, results in a cumulative scenario that would have major adverse impacts on the visual values in the visual resources cumulative geographic scope (BrightSource, 2011). Commonly employed visual mitigation measures, such as those proposed in this section, would slightly reduce the cumulative visual impacts, but not to such a degree as to avoid or substantially reduce the impacts to visual values of the region. The cumulative impact would be long-term, adverse and unavoidable. The following sections provides additional details on the type and severity of cumulative visual impacts that would be experienced from each of the KOPs, from I-10, and for dispersed recreational users in the surrounding wilderness.

4.19.7.1 Impacts on KOPs/Visual Contrast Ratings

In general, the addition of the cumulative projects to the visual simulations presented for KOPs 1 through 7 would increase the degree of visual contrast for affected viewers to moderate or strong levels. In the case of KOP 5, the KOP is located within the boundaries of a foreseeable project in the cumulative scenario; in other cases, the addition of foreseeable projects results in a doubling or tripling of the horizontal view extent taken up by renewable energy developments. From some KOPs, new developments in the cumulative scenario would not be contained within one view direction and would be visible from multiple directions. The estimated visual contrast created by the cumulative scenario from each of the KOPs discussed in Section 4.19.4 is shown in Table 4.19-5. In sum, the cumulative scenario would have adverse and unavoidable visual resource impacts from nearly all of the KOPs that could not be sufficiently mitigated with feasible mitigation measures.

4.19.7.2 Motorists on I-10

Visual changes as a result of other projects in the cumulative scenario, including the BSPP, the Blythe Airport Solar Project, Desert Quartzite, Palo Verde 2 (Sonoran West), Colorado River Substation Expansion, and a 21 MW PV facility proposed to the south of I-10 and the Blythe Airport (CUP03602); would be visible to travelers on I-10, who would also experience views of the MSEP gen-tie line. The combined effect of large-scale landscape alterations that would be visible along the length of I-10 within the CDCA Plan area could substantially degrade the visual character and the general scenic appeal of the landscape.

TABLE 4.19-5
ESTIMATED VISUAL CONTRAST OF CUMULATIVE SCENARIO

ID	Name	Visual Contrast of MSEP	Estimated Visual Contrast of the Cumulative Scenario	Contribution of the MSEP to the cumulative visual contrast
KOP 1	Fairway Villas Golf Community	None to weak	**Strong**: The Gypsum solar project and an unnamed county solar project would be located in the foreground to middleground and would dominate views of the valley floor. It would be difficult for a casual observer to overlook the visual changes because solar energy developments would be visible from multiple view directions. The extent of the horizon line occupied by more distant solar facilities (BSPP and EnXco) would approximately triple that taken up by the MSEP alone.	**Minor**: The strong visual contrast from KOP 1 would remain in the absence of the MSEP because other projects in the cumulative scenario are located in closer proximity and would contribute to the vast majority of the visual contrast.
KOP 2	Midland LTVA	None to moderate	**Strong**: The cumulative scenario would dominate the character of the landscape from this KOP for the same reasons described for KOP 1.	**Minor**: The MSEP's contribution to visual impacts would be minor for the same reasons described for KOP 1.
KOP 3	Foot of the Big Maria Mountains	Weak to moderate	**Strong**: From this elevated vantage point, nearly all solar energy developments proposed on the Palo Verde Mesa would be visible (roughly 33,500 acres). While foreground/proximal views of the valley floor would remain undisturbed from this perspective, solar energy developments in middleground and background views of the valley would dominate the visual character and could not be overlooked by a casual observer.	**Minor**: The strong visual contrast from KOP 3 would remain in spite of the presence of the MSEP. The MSEP would occupy approximately 12 percent of the land area (visible from this KOP) that would be developed by renewable energy.
KOP 4	BLM Kiosk at Midland and Arlington Mine Road	None to moderate	**Moderate**: From this KOP, foreground views would remain undisturbed, although substantially more Projects would be visible in distant views of the valley floor. Due to the position of the viewer relative to proposed developments, the visual changes would be restricted to distant views of the valley floor and appear as a narrow strip. The projects in the cumulative scenario together would attract the attention of a casual observer, but would not dominate the landscape character.	**Minor**: The MSEP's contribution to visual impacts would be minor for the same reasons described for KOP 1.
KOP 5	Open OHV Route No. 661085	None to weak	**Strong**: This viewpoint would be located within the proposed EnXco solar energy development. Middleground and background views of the valley floor would be fully removed due to view blockage. The EnXco would dominate the view from all directions	**Minor**: The MSEP's contribution to visual impacts would be minor because it is unlikely the viewer would see any other Project other than the EnXco Project (due to view blockage).
KOP 6	Eastbound I-10	None to weak	**Strong:** See section 4.19.7.2	**Minor**: see section 4.19.7.2
KOP 7	Westbound I-10	None to weak	**Strong:** See section 4.19.7.2	**Minor**: see section 4.19.7.2

Numerous existing cultural modifications are visible from the I-10 corridor, including transmission lines, pipelines, 4-wheel drive tracks, and widely scattered facilities and structures; however, the general character is of an unimpaired, isolated desert landscape. The cumulative scenario includes many large-scale solar plants whose scale, potential glare, and pervasiveness would adversely impact the continued existence of that general character. If all the cumulative projects included in Section 4.1 were to be implemented (which is considered unlikely), they would convert at least 70,438 acres within the I-10 corridor viewshed between roughly Desert Center and Blythe (approximately 50 miles) from an undeveloped desert viewshed to a more industrialized appearance (mostly with large solar array fields using both thermal and photovoltaic technologies).

In many cases, the apparent scale of the projects from motorists' perspective would be diminished greatly by favorable topographic relationships. The cumulative projects are at the same or similar elevation as the highway, and are reduced in prominence due to their distance from the highway and low angle of view. In many cases, the other projects in the cumulative scenario would blend in with the horizon line of the valley floor, and the rugged mountains would remain the dominant visual features in the landscape, although this is decreasingly the case further west toward Desert Center where I-10 is elevated relative to the proposed solar energy developments. Because the landscape is currently undeveloped and valued by visitors for its isolated and unspoiled condition, the addition of numerous new large-scale solar projects would substantially degrade the scenic experience for many travelers along I-10, due to the projects' industrial character and visual contrast. Mitigation measures are available that reduce the color contrast of structures, or the line contrast of vegetation clearing; but the measures reduce the contrast of certain features of the projects at various distances. Due to the size, extent and geographic dispersal of renewable energy projects in the cumulative scenario along I-10, mitigation measures would be insufficient to substantially reduce the visual impacts of the cumulative scenario. Travelers along I-10 between Desert Center and Blythe, assuming all projects in the cumulative scenario are approved and built, would have very few viewsheds offering an undisturbed desert landscape. For these reasons, the cumulative scenario would have a moderate to major (depending on visual sensitivity and visual exposure factors) adverse impact on the I-10 view corridor. Thus, the cumulative scenario would present an unavoidable and adverse impact for travelers along I-10 that could not be feasibly mitigated.

4.19.7.3 Dispersed Recreational Users in Surrounding Mountains

Dispersed recreational users in the Palen-McCoy and Big Maria Mountains Wilderness surrounding the MSEP—due to their elevated position and access to unencumbered, panoramic views of the valley below—could experience both additive and synergistic impacts in the cumulative scenario. The MSEP, along with other projects in the cumulative scenario, including the BSPP, Gypsum Solar, and enXco McCoy, would not result in direct visual alteration to BLM wilderness areas; but the scale and contrast created by numerous renewable energy projects would greatly alter views of the valley floor experienced by wilderness users (see Table 4.19-4). Unlike the impacts of the MSEP alone, which would occur within the context of an undisturbed desert landscape and would be somewhat diminished in importance relative to vast and expansive views, the extent of development on the valley floor under the cumulative scenario would be great enough that it would dominate the landscape character and would not be confined within a single view (i.e., new developments would be visible in multiple view direction). Existing cultural modifications on the valley floor are largely limited to linear alignments (e.g., roads and transmission lines), or other structures that are diminished in importance due to the considerable distance from which they are viewed. However, the cumulative scenario presents numerous large-scale renewable energy projects that would be readily apparent to most wilderness users. The MSEP, in combination with other projects, would make the valleys surrounding the Palen-McCoy, Big Maria Mountains, and Rice Wilderness appear increasingly industrialized, and could substantially diminish the remote and isolated character of the landscape and have a substantial adverse impact on the wilderness character. While use levels in the mountains and wilderness surrounding the MSEP are generally low, the remote and isolated character of the landscape is highly valued by its users, and could represent the primary attraction.

Available mitigation measures could not feasibly reduce the scale and contrast created by development of the cumulative projects, especially from elevated viewpoints. Even with mitigation, visitors to the higher elevation wilderness in the region would be exposed to large-scale renewable energy developments on valley floors from multiple locations and in several view directions, causing a substantial adverse impact on wilderness values. Thus, the cumulative scenario presents an unavoidable and adverse impact for dispersed recreational users in surrounding, higher-elevation wilderness.

4.19.8 Mitigation Measures

Project design elements proposed by the Applicant would avoid or reduce potential visual resource-related impacts that otherwise could result from the Project or any of the action alternatives (see Table 2-7 in Chapter 2, *Proposed Action and Alternatives*). For example, APM AIR-1 would address construction-generated air quality impacts (see Section 4.2, *Air Resources*), APM AIR-2 would address operation- and maintenance related air emissions (see Section 4.2, *Air Resources*), and APM HYDRO-1 would protect jurisdictional washes (see Section 4.20, *Water Resources*). These measures would be implemented like other elements of the Project, and are not “mitigation measures” as the term is used in the NEPA context.

In accordance with CEQ guidance and BLM NEPA Handbook §6.8.4, reasonable, relevant mitigation measures that could improve a proposed project can be applied to reduce or eliminate adverse impacts whether or not the impacts are “significant” as that term is defined by NEPA. Project impacts could be reduced by the implementation of Mitigation Measures VIS-1 through VIS-4, which are set forth below.

VIS-1: Project Design, Building and Structural Materials. Visual design elements shall be integrated into the construction plans, details, shop drawings and specifications; these shall include, but not be limited to, grubbing and clearing, vegetation thinning and clearing, grading, revegetation, drainage, and structural plans. Visual design elements within the plans shall be measureable and monitored while under construction, while operational, and when decommissioned. The plans shall include a monitoring and compliance plan that establishes the monitoring requirements and thresholds for acceptable performance. A careful study of the site shall be performed to identify appropriate colors and textures for materials; both summer and winter appearance shall be considered as well as seasons of peak visitor use (September 15 to April 15). Visual design elements to be integrated into construction plans, details, shop drawings and specifications must at a minimum include:

1. Vegetation and ground disturbance associated with access road construction, gen-tie and distribution line installations, and the perimeter access road shall be minimized and take advantage of existing clearings wherever feasible.

2. Along all off-site access roads, all off-site gen-tie and distribution line corridors, and all internal access roads 16 feet or wider, graveled surfaces, areas to be permanently cleared of vegetation, and (if applicable) cut slopes shall be treated with rock stains or other color treatment appropriate with the surrounding landscape.

3. Openings in vegetation for facilities, structures, roads, and gen-tie line monopoles (and/or H-frames), shall be feathered and shaped to repeat the size, shape, and characteristics of naturally occurring openings.

4. The backs or non-energy gathering side of the solar panels shall be color-treated to reduce visual contrast with the landscape setting. Since not all of the panels are visible outside the project footprint, the exact number and location of panels that will require color treatment shall be determined prior to installation.

5. Security fencing shall be coated with black poly-vinyl or other visual contrast reducing color.

6. Materials, coatings, or paints having little or no reflectivity shall be used whenever possible.

7. Grouped structures, including the water tanks and prefabricated buildings, shall be painted the same color to reduce visual complexity and color contrast.

8. The gen-tie line and the distribution line shall utilize nonspecular conductors and nonreflective coatings on insulators.

9. The choice of color treatments shall be based on the appearance at typical viewing distances and consider the entire landscape around the proposed development as it would be viewed from publically accessible locations. Appropriate colors for smooth surfaces often need to be two to three shades darker than the background color to compensate for shadows that darken most textured natural surfaces. Choice of colors shall be made from the BLM Standard Environmental Color Chart CC-001 in consultation with a BLM landscape architect or other designated visual resource specialist.

10. A lighting plan shall be prepared that documents how lighting will be designed and installed to minimize night-sky impacts during facility construction and operations. Lighting for facilities should not exceed the minimum number of lights and brightness required for safety and security, and should not cause excessive reflected glare. Low-pressure sodium light sources should be used to reduce light pollution. Full cut-off luminaires should be used to minimize uplighting. Lights should be directed downward or toward the area to be illuminated. Light fixtures should not spill light beyond the project boundary. Lights in highly illuminated areas that are not occupied on a continuous basis should have switches, timer switches, or motion detectors so that the lights operate only

when the area is occupied. Where feasible, vehicle mounted lights should be used for night maintenance activities. Wherever feasible, consistent with safety and security, lighting should be kept off when not in use. The lighting plan should include a process for promptly addressing and mitigating complaints about potential lighting impacts.

VIS-2: Construction Phase Visual Mitigation. A pre-construction meeting with BLM landscape architects or other designated visual/scenic resource specialists shall be held before construction begins to coordinate on the VRM mitigation strategy and confirm the compliance-checking schedule and procedures. Final design and construction documents will be reviewed for completeness with regard to the visual mitigation elements, assuring that requirements and commitments are adequately addressed. The construction documents shall include, but not be limited to grading, drainage, revegetation, vegetation clearing, and feathering plans, and must demonstrate how VRM objectives will be met, monitored, and measured for conformance. Specific measures shall include the following:

1. The Applicant shall reduce visual impacts during construction by clearly delineating construction boundaries and minimizing areas of surface disturbance; preserving existing, native vegetation to the extent feasible; utilizing undulating surface-disturbance edges; stripping, salvaging, and replacing topsoil; using contoured grading; controlling erosion; using dust suppression techniques; and restoring exposed soils to their original contour and vegetation.

2. Visual impact mitigation objectives and activities shall be discussed with equipment operators before construction activities begin.

3. Existing rocks, vegetation, and drainage patterns shall be preserved to the extent feasible.

4. Brush-beating or mowing or using protective surface matting rather than removing vegetation shall be employed where feasible.

5. Slash from vegetation removal shall be mulched and spread to cover fresh soil disturbances as part of the revegetation plan. Slash piles shall not be left in sensitive viewing areas.

6. The visual color contrast of graveled surfaces shall be reduced with approved color treatment practices.

7. No paint or permanent discoloring agents shall be applied to rocks or vegetation to indicate surveyor construction activity limits.

8. All stakes and flagging shall be removed from the construction area and disposed of in an approved facility.

VIS-3: Operation and Maintenance Phase Visual Mitigation. Terms and conditions for VRM mitigation compliance should be maintained and monitored for compliance with visual objectives, adaptive management adjustments, and modifications as necessary and approved by the BLM landscape architect or other designated visual/scenic resource specialist. Minimum measures are as follows:

1. The Applicant shall maintain revegetated surfaces until a self sustaining stand of vegetation is re-established and visually adapted to the undisturbed surrounding vegetation. No new

disturbance shall be created during operations without completion of a VRM analysis and approval by the AO.

2. Interim restoration shall be undertaken during the operating life of the Project as soon as possible after disturbances.

3. Painted facilities shall be kept in good repair and repainted when color fades or flakes.

4. Color-treated solar panel backs/supports shall be kept in good repair, and retreated when color fades and/or flakes.

VIS-4: Decommissioning and Site Reclamation Plan. A Decommissioning and Site Reclamation Plan, covering visual impact mitigation measures, shall be in place prior to construction, and reclamation activities should be undertaken as soon as possible after disturbances occur and be maintained throughout the life of the Project. The following decommissioning/reclamation activities/practices shall be implemented to partially mitigate visual impacts associated with solar energy development, where feasible:

1. Pre-development visual conditions, and the B-Quality scenery (north of I-10), and the C-Quality scenery (south of I-10), and integrity shall be reviewed, and the visual elements of form, line, color, and texture shall be restored to pre-development visual compatibility or to that of the surrounding landscape setting conditions, whichever achieves the better visual quality and most ecologically sound outcome.

2. A Decommissioning and Site Reclamation Plan shall be developed, approved by the BLM, and implemented. The plan shall require that all aboveground and near-ground structures be removed. Some structures shall be removed only to a level below the ground surface that will allow reclamation/restoration. Topsoil from all decommissioning activities shall be salvaged and reapplied during final reclamation. The plan shall include provisions for monitoring and determining compliance with the Project's visual mitigation and reclamation objectives.

3. Soil borrow areas, cut-and-fill slopes, berms, water bars, and other disturbed areas shall be contoured to approximate naturally occurring slopes, thereby avoiding form and line contrasts with the existing landscapes. The Applicant shall contour to a rough texture (i.e., use large rocks/boulders, grade uneven surfaces, and/or vegetation mulches/debris) in order to trap seed and to discourage off-road travel, thereby reducing associated visual impacts.

4. A combination of seeding, planting of nursery stock, transplanting of local vegetation within the proposed disturbance areas, and staging of decommissioning activities enabling direct transplanting shall be utilized. Where feasible, native vegetation shall be used for revegetating to establish a composition consistent with the form, line, color, and texture of the surrounding undisturbed landscape.

5. Stockpiled topsoil shall be reapplied to disturbed areas, and the areas shall be revegetated by using a mix of native species selected for visual compatibility with existing vegetation, where applicable, or by using a mix of native and non-native species if necessary to ensure successful revegetation. Gravel and other surface treatments shall be removed or buried.

6. Rocks, brush, and vegetal debris shall be restored whenever possible to approximate pre-existing visual conditions.

7. Edges of revegetated areas shall be feathered to reduce form and line contrasts with the existing landscapes.

8. A decommissioning VRM Monitoring and Compliance Plan shall be prepared by the Applicant and approved by the BLM that establishes the schedule and terms for monitoring and the conditions and methods of measurement for determining compliance.

4.19.9 Residual Impacts after Mitigation Incorporated

The implementation of Mitigation Measures VIS-1 through VIS-4 would reduce, but not eliminate, adverse cumulative impacts to KOPs, the I-10 corridor, and viewsheds of designated wilderness would remain. These residual impacts of the Project and alternatives would be unavoidable.

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4.20 Water Resources

4.20.1 Methodology for Analysis

This analysis of potential impacts of the Proposed Action and Alternatives on Water Resources, including hydrology and water quality, is based on the independent review by the BLM and its environmental consultant of technical studies including the following, which were provided by the Applicant:

1. AECOM, 2011a. *McCoy Solar Energy Project Pre/Post-Development Hydrology Report, McCoy Solar Energy Project, Riverside County, CA* (November, 2011).
2. AECOM, 2011b. Assessment of Proposed Groundwater Use – Results of Numerical Groundwater Modeling, McCoy Solar Energy Project, Palo Verde Mesa, Riverside County, CA.
3. Tetra Tech EC, Inc., 2011a. McCoy Solar Energy Project Jurisdictional Delineation Report for Regulated Waters of the State of California, Riverside County, California. (December 6, 2011).

4.20.2 Applicant Proposed Measures

The following APM was developed by the Applicant to address potential effects on water resources. The impact analysis assumes that the APM would be applied as part of the Project prior to implementing mitigation measures identified later in this section.

HYDRO-1: To address impacts to state jurisdictional washes:

a. The Project will be designed to ensure that post-development downstream hydrology will remain essentially the current downstream hydrology.

b. The final locations of poles and spur roads associated with the linear facilities will be designed to be flexible so that drainages that cross the linear corridor will be avoided to the extent feasible.

c. The Applicant proposes the following mitigation ratios to be used for the state jurisdictional waters that will be impacted by the Project:

SOLAR PLANT SITE

Vegetation Community/Land Cover	Permanent Impacts (acres)		Proposed Mitigation Ratio	Mitigation Acres		
	Unit 1	Unit 2		Unit 1	Unit 2	Total
Ephemeral “Riparian” Drainages						
Desert Dry Wash Woodland (Blue Palo Verde-Ironwood Woodland Alliance)	0	1.5	3:1	0	4.5	4.5
Mesquite Bosque	0	0	3:1	0	0	0
Vegetated Ephemeral Channels (Wash-dependent Vegetation with Sparsely Scattered Trees)	2.8	38.1	1.5:1	4.2	57.2	61.4

SOLAR PLANT SITE (Continued)

Vegetation Community/Land Cover	Permanent Impacts (acres)		Proposed Mitigation Ratio	Mitigation Acres		
	Unit 1	Unit 2		Unit 1	Unit 2	Total
Ephemeral “Riparian” Drainages (cont.)						
Vegetated Ephemeral Channels (Vegetated with No Trees)	47.3	50.4	1:1	47.3	50.4	97.7
Unvegetated (approximately less than or equal to 5% cover)	10.2	15.1	1:1	10.2	15.1	25.3
Subtotal Ephemeral “Riparian” Drainages	**60.3**	**105.1**	-	**61.7**	**127.2**	**188.9**
Upland Vegetation						
Sonoran Creosote Bush Scrub	2198.7	2072.9	1:1	2198.7	2072.9	4271.6
Stabilized and Partially Stabilized Desert Dunes (Sand Sheets and Dunes: Creosote Bush-White Burr Sage-Galleta Grass)	0	0	3:1	0	0	0
Subtotal Upland Vegetation	**2198.7**	**2072.9**		**2198.7**	**2072.9**	**4271.6**
Other Cover Types						
Agricultural Land (Crops, Ruderal Vegetation, or Bare Ground)	0	0	0	0	0	0
Developed (No Vegetation)	0	0	0	0	0	0
Subtotal Other Cover Types	**0**	**0**	-	0	0	0
Subtotals for Solar Plant Site	**2,259**	**2,178**	**-**	**2260.4**	**2200.1**	**4460.5**
	4,437					

LINEAR FACILITIES

Vegetation Community/ Land Cover	Gen-tie and Access Rd Impacts[1] (acres)		Distribution Line Impacts (acres)		Proposed Mitigation Ratio	Mitigation Acres
	Temporary	Permanent	Temporary	Permanent		
Ephemeral “Riparian” Drainages						
Desert Dry Wash Woodland (Blue Palo Verde-Ironwood Woodland Alliance)	0.5	0.7	0.1	0.8	3:1	6.3
Mesquite Bosque	0.2	0.2	0	0	3:1	1.2
Vegetated Ephemeral Channels (Wash-dependent Vegetation with Sparsely Scattered Trees)	0.0	0.0	0	0	1.5:1	0
Vegetated Ephemeral Channels (Vegetated with No Trees)	0.1	0.1	0	0	1:1	0.2
Unvegetated (approximately less than or equal to 5% cover)	0.2	0.1	0	0	1:1	0.3
Upland Vegetation						
Sonoran Creosote Bush Scrub	9.8	15.0	1.5	2.6	1:1	28.9

LINEAR FACILITIES (Continued)

Vegetation Community/ Land Cover	Gen-tie and Access Rd Impacts[1] (acres)		Distribution Line Impacts (acres)		Proposed Mitigation Ratio	Mitigation Acres
	Temporary	Permanent	Temporary	Permanent		
Upland Vegetation (cont.)						
Stabilized and Partially Stabilized Desert Dunes (Sand Sheets and Dunes: Creosote Bush-White Burr Sage-Galleta Grass)	19.0	19.0	0	0	3:1	114
Other Cover Types						
Agricultural Land (Crops, Ruderal Vegetation, or Bare Ground)	0	0	0.3	2	0	0
Developed (No Vegetation)	14.5	21.8	0	0	0	0
Subtotal for Linear Facilities	**44.3**	**56.9**	**1.9**	**5.4**	**-**	**150.9**
Grand Total (Solar Plant Site and Linear Facilities)	**4545.5**				**-**	**4611.4**
Grand Total without Developed Area[2]	**4509.2**				**-**	**4575.1**

1 Includes impacts associated with poles, spur roads, gen-tie maintenance road, pull sites, laydown yard, and the main access road.
2 The developed area refers to a portion of the main access road.

4.20.3 Alternative 1: Proposed Action

4.20.3.1 Direct and Indirect Impacts

Construction

Some impacts related to ground disturbance, such as those relating to surface water and drainage patterns and flood hazard areas, would begin during the construction phase and continue throughout the operation and maintenance phase, and are therefore described below under *Operation and Maintenance*. Where appropriate, a distinction is made between temporary impacts, which would occur during construction only, and long-term impacts, which would occur during both phases.

Groundwater Supply and Recharge

Groundwater withdrawals would occur during construction. A model was completed in order to evaluate the combined effects of pumping associated with construction and operation. Results indicated that the model-predicted drawdown outside of the solar field boundary would be less than 0.1 foot at the end of construction. Additionally, potential effects of construction withdrawals on PVID facilities were minimal, resulting in a minor change in PVID drain mass balance of about 0.09 AF. Because the model considered the construction and operation periods together, the results for both phases and described in more detail under *Operation and Maintenance.*

Water Quality

Construction of the MSEP would require the use of heavy machinery for vegetation grubbing, grading, and installation of roads, pipelines, generation facilities, transmission facilities, administration buildings, the solar field, and other facilities as discussed previously. Construction of these facilities would involve the use of bulldozers, graders, semi-trucks, and various other heavy machinery, and would involve changes to on-site topography. These activities would potentially loosen existing surface soils and sediments, increasing the potential for erosion during storm events. Additionally, the use of construction equipment may involve the accidental release of fuel, oils, brake dust, lubricants, antifreeze, and other potentially hazardous substances at the construction site. These water quality pollutants could become entrained in surface water during storm events, and/or be infiltrated into groundwater and the underlying aquifer, resulting in the degradation of water quality. According to preliminary discussions with the Colorado River RWQCB, Project construction is not anticipated to require acquisition of coverage under the NPDES General Permit for Construction Activities. Implementation of Mitigation Measure WATER-1, which requires implementation of a SWPPP, would reduce the potential water quality degradation of stormwater emanating from the MSEP site.

Flooding

In the event that a major storm event occurs during construction of the MSEP, unanticipated flooding could occur on site. Potential for damage to facilities due to on-site flooding would be exacerbated during the construction period. This is because a major flood event could occur at any time, including prior to the completion of the proposed stormwater management facilities on site. Therefore, unless construction practices and procedures are carefully managed, construction period flooding could result in damages to on site facilities, interference with the construction process, and potential exposure of employees to flood conditions. To minimize potential for construction period flooding to affect on site facilities, implementation of Mitigation Measure WATER-6 would be required.

Operation and Maintenance

Groundwater Supply and Recharge

The impact assessment for groundwater was performed based on the results of a numerical groundwater model (Palo Verde Groundwater Model) that was previously developed for the BSPP, which is located immediately south of the MSEP. The model encompasses the entirety of the Palo Verde Valley inclusive of both the PVMGB and the PVVGB; these basins considered together are hereafter referred to as the PVGB. The Palo Verde Groundwater Model was modified to accommodate the change in location of the proposed water supply wells. Model runs and associated documentation were completed by AECOM (2011a), in order to predict:

1. The effects from MSEP-only pumping during construction and operation, on groundwater supply wells on the Palo Verde Mesa, and how pumping might affect PVGB storage;

2. The cumulative effects of all proposed projects in the Palo Verde Valley on water levels and groundwater basin storage (results from this portion of the evaluation are considered under the subsequent discussion of cumulative impacts); and

3. To what extent the MSEP could cause a change in flux of surface water in PVID drains into underlying groundwater in the floodplain.

The Palo Verde Groundwater Model was constructed as a single-layer (two dimensional) numerical groundwater flow model in MODFLOW2000, with a domain that encompassed the entire Palo Verde Valley, inclusive of the mesa and floodplain. The base of the model was established at the bottom of the younger and older Colorado River alluvium, since these are the productive aquifers in the valley. A variety of boundary conditions were employed to simulate inflow and outflow of water from the model following the basin water balance. The model was calibrated to steady-state conditions and average measured water levels from wells on both the mesa and floodplain from 1980 to 2009. The model also used the average measured discharge data from the PVID drains as a measure of model calibration. Additional details regarding model design can be found in the Pre-/Post-Development Hydrology Report (AECOM, 2011a).

The Palo Verde Groundwater Model was updated to reflect the anticipated pumping scheme for the MSEP, and model grid spacing was updated accordingly. Two wells, a north well and a south well, were placed in the eastern half of the solar plant boundary and simulated to draw water from depths of approximately 400 to 500 feet bgs. The model assumed pumping volumes of a total of 750 AF over a 3-year construction period (160 gpm),[1] and 30 AFY (18 gpm)[2] over a period of 30 years during operation. Three pumping scenarios were modeled, each resulting in a different proportion of pumping from the northern and southern wells. The results of these scenarios are shown in Table 4.20-1.

TABLE 4.20-1
MODELED PUMPING SCENARIOS

Model Simulation	Construction Supply	Operational Supply
Scenario A	Northern well – 80 gpm Southern well – 80 gpm	Northern well – 18 gpm Southern well – off
Scenario B	Northern well – 160 gpm Southern well – off	Northern well – 18 gpm Southern well – off
Scenario C	Northern well – off Southern well – 160 gpm	Northern well – off Southern well – 160 gpm

SOURCE: AECOM, 2011a

Model results for MSEP pumping, during construction and operation are shown in Figures 4.20-1 to 4.20-3, for each of the scenarios shown in Table 4.20-2. As shown on the figures, regardless of the well configuration or associated pumping schedule, the influence from MSEP pumping would be minimal. The model predicted that drawdown outside of the solar plant boundary would be less

1 After modeling was completed, the anticipated construction period increased to 46 months (see Chapter 2), but the total anticipated water consumption did not change. A total of 750 AF pumped over 46 months results in a pumping rate of approximately 120 gpm. For consistency with the modeling result and to use a conservative estimate of construction-related water pumping volumes, this section uses the 160 gpm pumping rate.

2 After modeling was completed, the anticipated operation period water consumption increased to a maximum of 45 AFY, resulting in a pumping rate of approximately 28 gpm. This change is reflected in the impact analysis provided. As discussed in Chapter 2, operation period water use would be up to 1,350 AF over the lifetime of the MSEP (45 AFY x 30-year lifetime), for a total MSEP related water use of 2,100 AF.

than 0.1 foot, both at the end of construction and at the end of operational pumping. As would be anticipated, the construction pumping produced a larger drawdown at the pumping well and correspondingly larger radius of influence. In general, the predicted cones of depression were similar among the three scenarios.

In no scenario did the model predict that the drawdown would extend beyond the PVMGB boundary into the PVVGB. This is intuitive given the low pumping rates of 160 gpm for construction and 18 gpm for operation, and also indicates that water from pumping largely comes from a combination of storage on the mesa, recharge in the McCoy Wash, and possibly minor underflow from Parker Valley to the PVMGB via the northern tip of the PVVGB. The proposed pumping would result in drawdowns of less than 1 foot at the nearest water supply wells. This analysis acknowledges that the potential maximum water use rate would be up to approximately 450 AF greater than the modeled scenario over the lifetime of the MSEP. This represents an approximately 27 percent increase in total water use, beyond the modeled scenario. However, given the minimal anticipated effect of the proposed pumping, as shown in Figures 4.20-1 to 4.20-3, even a 27 percent increase in pumping intensity is expected to result in only minimal drawdown effects, with less than 1 foot of drawdown anticipated at the nearest water supply wells. The change in groundwater basin storage as a result of MSEP pumping is similarly minor. The proposed water supply (1,680 to 2,100 AF) represents approximately 0.02 to 0.03 percent of the estimated 6.84 million AF in storage in the PVGB. Therefore, the proposed pumping regimes are not anticipated to result in a significant drawdown of groundwater levels, or a significant reduction of total basin storage.

With respect to effects on PVID drains, model results indicate that there would be a very small change in the PVID drain mass balance between the non-pumping and pumping condition at the end of construction of 0.09 AF and a total change of about -128 AF at the end of the operation and maintenance period. The total change represents variance of -0.001 percent of the modeled throughput in the PVID drains over the 33 year combined construction, operation, and maintenance period (12.8 million AF) and about 8 percent of the total MSEP water use. The small percentage of the total amount of water being pumped for the Project (1,680 to 2,100 AF) indicates that most of the groundwater for pumping is coming from outside of the PVVGB, and thus outside the area where PVID facilities are located. It is important to note that this small of a change could not be reliably measured in the PVID drains and thus the model prediction cannot be verified. Further, it is also important to note that it is likely that this prediction is a function of the overall simplicity and limitations of the two-dimensional groundwater model and steady-state calibration, rather than a reflection of likely processes, given the very low proposed pumping volume. The change is very small in relationship to the overall PVID drain throughput in the model, and as such should be considered within the error of the model to reliably predict the change in mass flux from the drains.

Installation of new impervious surfaces can in some cases result in reductions in ground surface infiltration capacity, potentially causing reductions in net groundwater recharge. As discussed in greater detail below (see subsequent discussion of stormwater flows), the MSEP would result in the installation of up to approximately 46.9 acres of new impervious surfaces, including 7.9 acres associated with the proposed solar field, and up to 39 acres associated with the proposed gen-tie line access road and other related facilities. Infiltration of stormwater would be prevented from occurring within these areas. However, the sandy desert soils located on site have generally high infiltration capacity. Additionally, areas surrounding the MSEP site would not be affected, and would remain pervious. Therefore, the potential effects of the proposed impervious surfaces on site would be minimal in comparison to the overall infiltration capacity of the MSEP site and surrounding areas. Within the solar field, the proposed panels are not expected to interfere with stormwater infiltration: rainfall incident on the panels would fall to the ground, which would remain pervious, and be permitted to infiltrate.

Any potential off-site impacts to nearby wells (i.e., decline in water table elevation or water quality) deemed to have been caused or exacerbated by Project activities would be addressed by Mitigation Measure WATER-7.

Surface Water and Drainage Patterns

The MSEP would be installed in an area that presently is drained primarily by sheet flow and desert washes. Low-frequency, high-intensity monsoonal storms in the region can result in high volumes of stormwater flow within the vicinity of the MSEP site, which can cause high volumes of surface runoff to occur in the vicinity of the Project area. Although on-site grading would be minimized, and major features of existing on-site drainages would be preserved, the installation of proposed facilities, including roads, fencing, and solar arrays, could interfere with existing drainage patterns on-site. These changes could result in altered hydrology on site or downstream, thereby causing increases in erosion and sedimentation. The following discussion reviews potential changes that could result in increased erosion and sedimentation at the solar field and associated appurtenances, as well as the gen-tie line.

Solar Field. Potential changes in hydrology at the main MSEP site were evaluated using a series of modeled hydrology/flow scenarios. Expanding on a prior hydrologic modeling study completed by Tetra Tech (2011b, as cited in AECOM, 2011a), 2-foot contour interval LIDAR topographic data and updated precipitation information became available. AECOM (2011a) utilized these updated data sources to develop hydrologic and hydraulic models that provide refined estimates of pre- and post-development surface water drainage characteristics at the MSEP site and vicinity. AECOM developed a HEC-HMS hydrologic model to simulate precipitation-induced runoff from tributary drainage basins up-slope of the MSEP site, including a total land surface area of 3,120 acres within the HEC-HMS model domain. Results from the hydrologic model were used as inputs (inflow hydrographs) to a FLO-2D hydraulic model, developed to simulate pre/post-development drainage conditions at and down-slope of the MSEP site.

Upstream hydrology relevant to the MSEP site includes surface water flow from five tributary basins originating in the McCoy Mountains to the west of the site. These drainage basins were modeled individually for the 10- and 100-year (24-hour duration) hydrologic events using HEC-HMS. Outflow hydrographs resulting from both storm events were generated for each of the five tributary basins, and then used to define the inflow contributions along the western FLO-2D model boundary. The flow generated up-slope of the MSEP solar plant site would not change as a result of the proposed development; therefore, the same inflow hydrographs were used in all model scenarios (AECOM, 2011a).

To quantify potential changes in flow characteristics at the MSEP site and its vicinity, a separate FLO-2D hydraulic model was developed (AECOM, 2011a). The model used output from the HEC-HMS model as inputs. Drainage conditions were simulated for a 120-hour period for the 10- and 100-year (24-hour duration) hydrologic events. Pre-development site conditions were modeled based on estimates of existing ground surface characteristics, and were used as a basis for comparison with subsequent results from post-development model scenarios. Six flow analysis cross-sections (XS-1 through XS-6) were established within the FLO-2D model, to quantify flows along the downstream portions of the MSEP site. Figure 3.20-2 shows the model configurations utilized for the HEC-HMS and the FLO-2D models, including the location of cross-sections.

Model results indicate that pre-development flow patterns on the site generally trend from west to east with a slight crescent pattern across the site. The crescent is described by a minor change in flow direction from northeast at the western MSEP site boundary to southeast at the eastern MSEP solar plant site boundary. Post-development flow patterns on the MSEP solar plant site are generally similar to those shown for the pre-development conditions. Slight changes are noted at the perimeter locations where the proposed fencing and perimeter road would be located. Tables 4.20-2 and 4.20-3 provide a summary of peak flow rate and total outflow volume, respectively, at the six flow analysis cross-sections shown in Figure 3.20-2, for the 10- and 100-year storm events. These flow analysis cross-sections characterize flows exiting the MSEP solar plant site.

TABLE 4.20-2
MODELED PEAK FLOW RATE AT CROSS-SECTIONS, PRE-DEVELOPMENT, POST-DEVELOPMENT, AND NET CHANGE (CFS)

Cross-Section No.	10-Year Storm Event			100-Year Storm Event		
	Pre-Flow	Post-Flow	Change	Pre-Flow	Post-Flow	Change
XS-1	118	126	8	718	813	95
XS-2	103	112	9	594	679	85
XS-3	124	150	26	782	895	113
XS-4	292	361	69	1918	2155	237
XS-5	35	37	2	348	353	5
XS-6	121	139	18	1083	1082	-1

SOURCE: AECOM, 2011a

TABLE 4.20-3
MODELED OUTFLOW VOLUMES AT CROSS-SECTIONS, PRE-DEVELOPMENT, POST-DEVELOPMENT, AND NET CHANGE (AF)

Cross-Section No.	10-Year Storm Event			100-Year Storm Event		
	Pre-Vol.	Post-Vol.	Change	Pre-Vol.	Post-Vol.	Change
XS-1	271	287	16	803	831	28
XS-2	266	291	25	799	838	39
XS-3	329	368	39	1020	1079	59
XS-4	706	797	91	2196	2317	121
XS-5	58	59	1	297	299	2
XS-6	329	344	15	1113	1127	14

SOURCE: AECOM, 2011a

As shown in Tables 4.20-2 and 4.20-3, increased peak flow rates and outflow volumes from the southeast portion of the MSEP site are anticipated as a result of site development (XS-1 and XS-2). Increases to peak flow rate and total outflow volume resulting from MSEP site development are generally less than 10 percent. However, results indicate an increase in flow of 14 percent at XS-2 and XS-3 for a 100-year event. During a 10-year event, a modeled increase of 21 percent was observed for XS-3, and a 24 percent increase was observed for XS-4. These changes are primarily attributable to flow intercepted by the perimeter road and fencing along the western, northern, and southern site boundaries, which has the effect of diverting flow toward the southeast corner of the site. This phenomenon is also further evidenced by the lesser increase or reduction of outflow from XS-5 and XS-6. Reduction in surface roughness along the roads has the effect of decreasing the time of concentration, thus generally increasing the magnitude of the peak flow rate downstream. Additionally, use of chain link fences can result in the entrapment of debris, which can result in localized backup of floodwaters. Increases in peak flow rate and total outflow volume at certain cross-sections are generally balanced by decreases in these metrics at other cross-sections. This phenomenon is interpreted to be the result of rerouting of flow rather than changes to the overall cumulative value of these metrics.

Figures 4.20-4 and 4.20-5 provide maps of model output, showing net change in flow velocity due to MSEP implementation during 10-year and 100-year events, respectively. Figures 4.20-6 and 4.20-7 provide maps of model output showing net change in maximum flow depth as a result of MSEP implementation, during 10-year and 100-year events, respectively. As shown on these figures, both flow depth and velocity increase slightly across the site in response to MSEP implementation. Post-development flow conditions at and downstream of the site are generally similar to the pre-development conditions, with some areas showing slight increases in flow (e.g., yellow shading near southeast corner of the site), and some areas showing slight decreases in flow (e.g., green shading near northeast boundary of the site). Changes to flow patterns resulting from development of the MSEP site primarily consist of slight rerouting of flow within the project site resulting from slight changes in interior surface roughness and construction of perimeter roadways and fencing. The changes to on-site flow patterns are evidenced by slight changes in peak flow rate and total outflow volume at the flow analysis cross-sections, as discussed above.

To evaluate the total area of drainages located on the MSEP site that would be disturbed by the project, a field reconnaissance was completed at the MSEP site. The field reconnaissance provided a preliminary determination with respect to state jurisdictional waters located within the footprint of MSEP facilities. No federally jurisdictional waters were identified. Table 4.20-4 provides a summary of waters that are anticipated to be jurisdictional at the state level, which are located within the MSEP footprint, for the solar field.

The effects of the MSEP on flows at the solar field were investigated using the hydrologic modeling described previously. Modeled results indicate that the MSEP would result in increases in flow rate of up to approximately 24 percent at cross-sections XS-2 and XS-3 (Tables 4.20-2 and 4.20-3). As discussed previously for erosion and sedimentation impacts, this modeled increase would result largely from the installation of roads on site, where stormwater is expected to experience less drag as it moves across roads than across native soils, resulting in increased flow rates.

TABLE 4.20-4
ANTICIPATED WATERS OF THE STATE, SOLAR FIELD SITE

Channel Forms	Permanent Impact (acres)		
	Unit 1	**Unit 2**	**Total**
Single Thread	0	1.5	1.5
Man-made Borrow Pit	0	0	0
Single Thread, Compound, Swales	47.6	103.3	150.9
Compound, Swales, Discontinuous Channels	8.8	20.3	29.5
Solar Field Total	**56.4**	**125.1**	**181.5**

SOURCE: Tetra Tech, 2011a

The potential for the MSEP to result in increased stormwater flows, such that existing or planned stormwater drainage facilities could be insufficient to convey flows, is considered minor. As noted above, the greatest potential for increase in flows would occur during a 100-year event, when modeled outfall from the site would increase by +200 cfs. Implementation of **Mitigation Measure WATER-3**, which would require implementation of drainage control and other facilities to minimize changes to downstream hydrology, would ensure that these changes do not result in a net impact to downstream waterways.

New impervious surfaces associated with the site would be limited in extent, and associated only with limited on-site paved areas and proposed structures. In total, a maximum of 7.9 acres of additional impervious surfaces would be installed, including 3.0 acres for the water treatment area, 0.3 acres for the O&M building and associated parking, and 4.6 acres for the main access road. Stormwater falling onto the solar arrays would drain onto the ground underneath, which would remain pervious. Solar array mounts, brackets, and transformers would result in only a very minor increase in total on-site impervious surfaces.

Gen-Tie Line. To evaluate the total area of drainages that would be disturbed by the Project, a field reconnaissance was completed along the proposed gen-tie line alignment. The field reconnaissance provided a preliminary determination with respect to state jurisdictional waters located within the footprint of the gen-tie line facilities. Table 4.20-5 provides a summary of waters that are anticipated to be jurisdictional at the state level, which are located within the footprint of the proposed gen-tie line.

Installation and operation of the proposed gen-tie line could alter natural stormwater drainages along the alignment of the proposed facility. Similar to the solar field, such changes could result in altered runoff and erosional processes on site, which could lead to increased erosion and sedimentation on site or downstream. In extreme cases, unless properly designed, undercutting of gen-tie facilities could occur, causing damage to proposed facilities, and/or additional on-site and downstream erosion and sedimentation effects.

TABLE 4.20-5
ANTICIPATED WATERS OF THE STATE, GEN-TIE LINE

Channel Forms	Impacts (acres)	
	Temporary	Permanent
Single Thread	0.1	0.4
Man-made Borrow Pit	0.2	0.3
Single Thread Compound, Swales	0.9	1.2
Compound Swales Discontinuous Channels	0.2	0.3
Total	**1.4**	**2.2**
Total Temporary and Permanent	**3.6**	

SOURCE: Tetra Tech, 2011a

Residual changes in hydrology would be minimal. The proposed gen-tie line would result in construction of new impervious surfaces; specifically, the small mounting pad areas associated with each pole would be impervious. Access roads and spur roads for the gen-tie line, as well as the proposed distribution line roads, may be paved (the remainder of this analysis assumes that access roads to the gen-tie line would be paved) and therefore could become impervious. The proposed switchyard would have an increased concentration of impervious facilities, but these would be limited in extent, and surrounding areas would remain pervious. In total, an additional 39 acres of impervious facilities would result from installation of the gen-tie line and associated facilities, including 0.5 acres associated with mounting pads, 28.2 acres associated with the proposed gen-tie access road, 2.8 acres associated with the proposed gen-tie spur roads, 2.0 acres for switchyards, 1.9 acres associated with the proposed distribution line spur roads, and 3.6 acres associated with the proposed distribution line maintenance road. Implementation of **Mitigation Measure WATER-3**, which would require development and adherence to the conditions of a Comprehensive Drainage, Stormwater, and Sedimentation Control Plan, would reduce potential impacts from these new impervious surfaces.

Flood Hazards

The drainage model developed for the solar field did not quantify or consider anticipated flood flows within the McCoy Wash. For perspective in understanding the extent to which the change in flows leaving the MSEP site could impact the hydrology, and associated flooding potential, of the McCoy Wash along the eastern boundary of the site, a review of anticipated peak outflows in comparison to anticipated McCoy Wash flows is useful. As modeled, the peak outflow from the eastern boundary of the solar field (represented as the sum of peak flow rates across XS-1, XS-2, and XS-6 in Table 4.20-2) is slightly less than 2,600 cfs for the 100-year storm event, with maximum changes between pre- and post-development conditions (across XS-1, XS-2, and XS-6 in Table 4.20-2) in peak flow rate of less than +200 cfs. Peak flow rates through McCoy Wash east of the site for the 100-year hydrologic event have been estimated to be on the order of 27,000 cfs (Tetra Tech, 2011b, as cited in AECOM, 2011a). Therefore, the increase in flows associated with the installation of the solar field and associated facilities (+200 cfs), between pre- and post-development 100-year peak flow rate (across XS-1, XS-2, and XS-6 in Table 4.20-2), equates to approximately 0.7 percent of simulated peak flow rate from the northwest and northeast basins of McCoy Wash (27,000 cfs; AECOM, 2011a). This minimal level of increase is not anticipated to result in a noticeable increase in surface flooding downstream, including flood depth and flood extent.

On-site inundation of the solar arrays during flood periods is anticipated as a matter of Project design. However, some of the proposed facilities on-site would require protection from flooding. For instance, unless suitably protected from flooding, the proposed on-site buildings could become inundated during a heavy storm event. Additionally, the proposed evaporation pond could become inundated. Implementation of **Mitigation Measure WATER-4**, which would require that all on-site buildings, maintenance areas, designated parking lots, and associated facilities be constructed at an elevation of at least 2 feet above the highest anticipated flood flows during a 100-year event, would reduce such risks. Implementation of **Mitigation Measure WATER-5** would ensure that workers and employees are protected in the event of a flood.

Water Quality

Potential threats to surface water and groundwater quality related to operation include: accidental releases from the evaporation pond that would be used to dispose of reverse osmosis reject water; leaching of treated wastewater from the proposed septic field; potential increases in sediment loads to adjacent washes; and accidental spills of hydrocarbon fuels, oils, and greases, antifreeze, and other liquids associated equipment maintenance and usage on site.

Accidental releases from the 1-acre evaporation pond could result from accidental overtopping during a storm event. This could result in a release of concentrated brine and associated water quality pollutants from the evaporation pond and into adjacent surface runoff. **Mitigation Measure WATER-2** would require that the evaporation pond be sized to accommodate project flows plus a 25-year storm event, with at least 1 foot of freeboard. Implementation of this mitigation measure would minimize risk of spillage of water from the evaporation pond onto adjacent areas during major storm events.

Degradation of groundwater quality could occur as a result from leakage of the proposed pond liner. The evaporation pond would require a Title 27 discharge permit issued by the Colorado River RWQCB, which would require adherence to WDRs and minimum standards for the pond liner, including monitoring. According to preliminary discussions with the Colorado River RWQCB, the WDRs would require the preparation of a Water Quality Monitoring and Response Plan that would include monitoring of the pond liner to detect leaks, as well as groundwater monitoring. Groundwater monitoring would be done using existing wells where possible, and may include additional monitoring wells as needed to provide adequate monitoring of groundwater quality, pursuant to the stipulations of the WDRs. Application of WDRs to the facility by the Colorado River Basin RWQCB would be tailored to the anticipated quality of water contained in the evaporation pond, in order to protect beneficial use from accidental release of pond pollutants. Therefore, adherence to the conditions of the WDRs would ensure that groundwater quality would be protected from degradation, consistent with the Basin Plan.

The use and application of septic fields is a long established practice as a method of wastewater treatment. The proposed septic system would be installed approximately 5 to 6 feet deep, in accordance with local regulations. These types of systems result in wastewater constituents being non-detectable within 3 feet of the bottom of the leach field.

The septic system and leach fields for the MSEP would be constructed in accordance with the requirements:

1. Uniform Plumbing Code (UPC) §15.24.010,Appendix K for Private Sewage Disposal – General and Disposal Fields; and

2. UPC §8.124.030 (Approval and Construction Permit for Sewage Discharge) and §8.124.050 (Operation Permit for Sewage Disposal).

The anticipated changes in flow rate indicated for the MSEP would range up to an increase of approximately 21 percent at the indicated cross-sections, as discussed previously. As discussed above, this modeled increase would result largely from the installation of roads on site, where stormwater is expected to experience less drag as it moves across roads than across native soils, resulting in increased flow. Where faster moving water or greater volumes of water contact unconsolidated sediments, increased erosion could result, both on site and downstream of the MSEP site. Implementation of Mitigation Measure WATER-3, which would require development and adherence to the conditions of a Comprehensive Drainage, Stormwater, and Sedimentation Control Plan, would reduce the potential for erosion and sedimentation.

During operation and maintenance, the on-site use of trucks, maintenance equipment, automobiles, and other on-site equipment could result in the accidental release of water quality pollutants. For instance, water quality impacts could occur during operation if contaminated or hazardous materials (oils, greases, fuels, etc.) used during operation were to contact stormwater and drain off-site. Potential spills of hazardous materials would be managed through hazardous materials management measures (see Section 4.9, *Hazards and Hazardous Materials*).

Decommissioning

Groundwater Supply and Recharge

Decommissioning would take 24 months and would require approximately the same water use for dust suppression as the construction phase, resulting in additional groundwater pumping of up to 250 AFY during decommissioning, or a total of up to 500 AF. As described for Project construction, which would use a greater overall volume of groundwater and the same or greater annual pumping rate, model results indicated that drawdown outside of the solar field boundary as well as potential effects of withdrawals on PVID facilities were minimal. Therefore, because decommissioning would result in lesser withdrawals than construction, it would not have an adverse effect on groundwater supply or recharge.

Additionally, operation period pumping would be minimal. Therefore, ceasing of operation period pumping due to decommissioning would be expected to result in a minimal to negligible increase in remaining groundwater supplies within the basin.

Surface Water and Drainage Patterns

Decommissioning of the MSEP would result in a minor reduction in on-site impervious structures, because on-site facilities would be removed. Removal of such facilities would not substantially affect on-site or downstream hydrology, due to the limited extent of such facilities. Similar to MSEP construction, decommissioning could result in alteration of on-site topography, and therefore of on-site drainage patterns. These changes could result in altered erosion and sedimentation patterns, which could affect downstream areas on site or off site. Implementation of Mitigation Measure WATER-3, which includes development and adherence to the recommendations of a Decommissioning Drainage, Stormwater, and Sedimentation Control Plan, would reduce potential impacts from erosion and sedimentation.

Flood Hazards

Decommissioning would remove structures and people from areas that may be subject to flood-related hazards. Effects during decommissioning would be similar to construction. After decommissioning is completed, no further effects would occur.

Water Quality

Decommissioning impacts generally would be similar to those indicated for construction, with respect to potential for release of construction related water quality pollutants. Implementation of Mitigation Measure WATER-1 during decommissioning would reduce the potential for water quality degradation during that period. Adherence to Colorado River RWQCB policies and stipulations of the evaporation pond's WDRs would ensure that water quality impacts associated with removal of that facility would be minimized.

4.20.4 Alternative 2: Reduced Acreage

4.20.4.1 Direct and Indirect Impacts

Construction, Operation, Maintenance, and Decommissioning

Construction of the reduced acreage alternative would be anticipated to have similar effects on water quality, groundwater levels and storage, erosion and sedimentation, surface water hydrology, flooding, and on site flood related impacts, as compared to the Proposed Action, except that Alternative 2 would result in reduced intensity of those impacts. The reduction in intensity of impacts for Alternative 2 in comparison to the Proposed Action would be roughly proportional to the reduced size of Alternative 2, in comparison to the Proposed Action. To ensure that the impacts of Alternative 2 are addressed, implementation of Mitigation Measures WATER-1 through WATER-5 would reduce potential impacts as described for the Proposed Action.

4.20.5 Alternative 3: Reconfigured Gen-tie/Access Road Routes

4.20.5.1 Central Route

Direct and Indirect Impacts

Construction, Operation, Maintenance, and Decommissioning

Construction, operation, maintenance, and decommissioning of the Central Route would have similar effects on water quality, erosion and sedimentation, surface water hydrology, and flooding, as compared to the proposed gen-tie line and access road. The primary difference between the proposed Eastern Route and the Central Route would be that a portion of the potential water quality, erosion, sedimentation, and flooding associated with construction, changes to drainage patterns, and new impervious surfaces, along the proposed gen-tie line route, would be altered. The Central Route would result in installation of a gen-tie line and associated access roads along an approximately 12.5-mile corridor, which is approximately 2 miles shorter than the Proposed Action. Therefore, the potential for water quality degradation would be slightly reduced in intensity relative to the Eastern Route proposed as part of the Project. Similarly, the potential for alteration of on-site hydrology, such as effects on erosion, sedimentation, and flooding, and including effects associated with proposed impervious surfaces, would be similar to those of the proposed Eastern Route, except slightly reduced in intensity. Potential disturbance areas for Waters of the State would be limited to those shown in Table 4.20-6.

**TABLE 4.20-6
ANTICIPATED WATERS OF THE STATE, ALTERNATIVE 3,
CENTRAL ROUTE GEN-TIE LINE**

Channel Forms	Impacts (acres)	
	Temporary	Permanent
Single Thread	0.1	0.4
Man-made Borrow Pit	0.2	0.3
Single Thread Compound, Swales	0.9	1.2
Compound Swales Discontinuous Channels	0.2	0.3
Total	**1.4**	**2.2**
Total Temporary and Permanent	**3.6**	

Implementation of Mitigation Measures WATER-1 and WATER-3 would ensure that construction, operation, maintenance, and decommissioning period impacts would be minimized. Other potential impacts and mitigation measures identified for the Proposed Action are associated with the solar plant site and other components of the Project that are not relevant to the selection of a gen-tie line and access road route. Therefore, these additional impacts and mitigation measures would be the same for the Central Route.

4.20.5.2 Western Route

Direct and Indirect Impacts

Construction, operation, maintenance, and decommissioning of the Western Route would have similar effects on water quality, erosion and sedimentation, surface water hydrology, and flooding, as compared to the proposed gen-tie line and access road. The primary difference between the proposed Eastern Route and the Western Route would be that a portion of the potential water quality, erosion, sedimentation, and flooding associated with construction, changes to drainage patterns, and new impervious surfaces, along the proposed gen-tie line route, would be altered. The Western Route would result in installation of a gen-tie line along an approximately 15.5-mile corridor, which would be approximately 1 mile longer than the Proposed Action. Therefore, the potential for water quality degradation would be slightly increased in intensity, in comparison to the Eastern Route proposed as part of the Project. Similarly, potential for alteration of on-site hydrology, such as effects on erosion, sedimentation, and flooding, and including effects associated with proposed impervious surfaces, would be similar to those of the proposed Eastern Route, except slightly increased in intensity. Potential disturbance areas for Waters of the State would be limited to those shown in Table 4.20-7.

TABLE 4.20-7
ANTICIPATED WATERS OF THE STATE, ALTERNATIVE 3,
WESTERN ROUTE GEN-TIE LINE

Channel Forms	Impacts (acres)	
	Temporary	Permanent
Single Thread	0.1	0.4
Man-made Borrow Pit	0.2	0.3
Single Thread Compound, Swales	0.9	1.2
Compound Swales Discontinuous Channels	0.2	0.3
Total	**1.4**	**2.2**
Total Temporary and Permanent	**3.6**	

Implementation of Mitigation Measures WATER-1 and WATER-3 would ensure that construction, operation, maintenance, and decommissioning-related impacts would be minimized. Other potential impacts and mitigation measures identified for the Proposed Action are associated with the solar plant site and other components of the Project that are not relevant to the selection of a gen-tie line and access road route. Therefore, these additional impacts and mitigation measures would be the same for the Western Route.

4.20.6 Alternative 4: No Action Alternative

Under Alternative 4, no change to baseline conditions with respect to on site or downstream hydrology, water quality, or groundwater levels would occur. Consequently, this Alternative would not cause the potential hydrologic resources impacts described for the Project.

4.20.7 Cumulative Impacts

The geographic scope of the cumulative impacts analysis with respect to water resources includes those areas overlying the PVGB for groundwater-related impacts, and the watershed for water quality and drainage-related impacts. The temporal scope for potential cumulative impacts includes the construction, operation, and maintenance periods of the Project.

4.20.7.1 Groundwater Levels and Supplies

As analyzed above, implementation of the MSEP would contribute the incremental impacts summarized below to the cumulative scenario. With respect to groundwater levels and groundwater supplies, the Project-specific groundwater model included consideration of a cumulative scenario, which included seven solar power projects in the vicinity of the MSEP that would be located on the Palo Verde Mesa: the Blythe Energy Project II, Blythe PV Project, BSPP, Desert Quartzite Solar Farm, Gypsum Solar, the MSEP, and the enXco McCoy Project. Together, these projects would result in a cumulative total pumping of approximately 131,000 AF of water over a 33-year period, including construction and operation flows.

Results from the cumulative model analysis are shown in Figure 4.20-8. As shown, results indicate that higher areas of drawdown would occur around the Blythe Energy II and enXco McCoy projects. The predicted drawdown contour of 0.01 foot is predicted at the end of 33 years of pumping to remain within the PVMGB, although it is located very close to the boundary with the PVVGB. Of the total 131,000 AF of water use under the cumulative scenario, the MSEP would result in only 1,680 to 2,100 AF of water use, or about 1.3 percent of total cumulative scenario water use. Additionally, as shown on Figure 4.20-8, the MSEP would not result in a cone of depression under the cumulative scenario.

4.20.7.2 Water Quality Impacts

With respect to water quality, the following projects were considered, which are located within the same watershed as the MSEP: BLM Renewable Energy Projects, including enXco McCoy, BSPP, Blythe Airport Solar I Project, Desert Quartzite, Gypsum Solar, Palo Verde 2, Rio Mesa; and other projects, including Blythe Energy Project Transmission Line, Blythe PV Project, City of Blythe projects, DPV2, CRS, Desert Southwest Transmission Line, Eagle Mountain Landfill Project, RCL00161R1, BGR100258, CUP03602, and the Palo Verde Mesa Solar Project.

During construction and operation of each of the cumulative projects, it is anticipated that fuels, antifreeze, paints, oils, and various other potential water quality pollutants, similar to those discussed for direct MSEP impacts, would be stored or utilized on site, in support of construction and operation period activities. Handling of such materials for all cumulative scenario projects would be regulated under applicable local, state, and federal requirements, as discussed for direct MSEP impacts. Cumulative projects could require implementation of additional mitigation in order to ensure minimization of potential impacts – such mitigation would be required in context of required environmental reviews completed for each project. Adherence to these requirements and mitigation measures would ensure that water quality effects of accidental releases of hazardous chemicals would be minimized. Minimal residual effects on water quality could occur, however, these would be expected to be discrete in nature, associated with isolated incidents (accidental spills), and generally of low occurrence due to the nature of projects anticipated, which do not represent major hazardous materials users or manufacturers.

With respect to water quality, erosion and sedimentation, the following projects were considered, which are located within the same watershed as the MSEP: BLM Renewable Energy Projects, including enXco McCoy, BSPP, Blythe Airport Solar I Project, Desert Quartzsite, Gypsum Solar, Palo Verde 2, Rio Mesa; and other projects, including the Blythe Energy Project Transmission Line, Blythe PV Project, City of Blythe projects, DPV2, CRS, Desert Southwest Transmission Line, Eagle Mountain Landfill Project, RCL00161R1, BGR100258, CUP03602, and the Palo Verde Mesa Solar Project.

These projects would result in installation of facilities and other earth work, including the installation of new impervious surfaces, which could alter on site drainage patterns or otherwise result in changes in on site drainage patterns. Potential changes would be generally similar in nature to those discussed for the MSEP, and would include a net increase in impervious surfaces and various grading activities, and facilities installations. These changes could result in concurrent alteration of stormwater flows and drainage patterns, which could potentially result in increased erosion and sedimentation. However, for the purposes of this analysis, it is presumed that the other projects considered here would also be required to implement mitigation measures, concurrent with NEPA, and other applicable environmental regulations. Implementation of such measures, which establish thresholds in the context of cumulative conditions, is anticipated to include construction and operation period controls on stormwater management, would minimize overall contributions to erosion and sedimentation within the watershed. While some level of residual impact would occur for each project, the applied mitigation measures are expected to be sufficient to minimize residual effects by requiring avoidance and mitigation of components and activities that would cause erosion and sedimentation.

4.20.7.3 Stormwater Drainage and Flooding

With respect to stormwater drainage, drainage system capacity, and flooding, the following projects were considered, which are located within the same watershed as the MSEP: BLM Renewable Energy Projects, including enXco McCoy, BSPP, Blythe Airport Solar I Project, Desert Quartzite, Gypsum Solar, Palo Verde 2, Rio Mesa; and other projects, including the Blythe Energy Project Transmission Line, Blythe PV Project, City of Blythe projects, DPV2, CRS, Desert Southwest Transmission Line, Eagle Mountain Landfill Project, RCL00161R1, BGR100258, CUP03602, and the Palo Verde Mesa Solar Project.

The cumulative projects, which represent primarily energy and other infrastructure projects, would not result in extensive development of new impervious surfaces. New impervious surfaces could include access roads, new buildings, and other areas; however, it is expected that runoff from these areas would be controlled via BMPs and other legal requirements. Of the cumulative projects considered within this analysis, the BSPP and MSEP would be the primary projects within the subwatershed where the project is located. As addressed in the discussion of direct impacts, this area drains into PVID-operated drainages. Both the MSEP and the BSPP implement drainage and flood management mitigation measures, designed to minimize flood impacts on site, and also minimize changes downstream. Both the MSEP and BSPP could result in minor residual increases in peak flood flows. However, the magnitude of these collective increases is anticipated to be within the available drainage capacity of applicable PVID drainages. Potential impacts associated with the remaining cumulative projects would be dispersed throughout the watershed. As a result, the cumulative projects would not rely on a single tributary or drainage structure/facility in order to convey stormwater and flood flows.

With respect to flood-related dangers, adherence to the proposed mitigation would ensure that potential direct impacts would be avoided for the MSEP site. Many of the other proposed projects reviewed in support of this cumulative analysis would utilize physical barriers and engineering to protect the site from inundation. However, other proposed projects would use a method for drainage control similar to the method used by the Project, namely, to permit continued overland flow on-site. Because such a flood management method could result in injury to workers or facilities, it is anticipated that other projects considered would also implement mitigation measures to minimize potential harm to workers and on-site facilities.

4.20.8 Mitigation Measures

Implementation of the following mitigation measures would address potential impacts associated with hydrologic resources.

WATER-1: Implementation of a SWPPP. To ensure that stormwater quality is protected during the construction and decommissioning period for the MSEP, as well as any maintenance done during the operational period, the Applicant shall comply with the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance (Order No. 2009-0009-DWQ) (Construction General Permit). Compliance with the Construction General Permit will ensure that the proposed construction activities would include BMPs to manage stormwater and control sediment and other pollutants from leaving the Project construction site. Compliance with the Construction General Permit will require completion and implementation of a Stormwater Pollution Prevention Plan (SWPPP) for the MSEP site that shall be in effect during all construction, maintenance, and decommissioning activities for the solar field, the gen-tie line, and all associated facilities. The SWPPP shall identify pollutant sources that may affect the quality of stormwater discharge and shall require the implementation of BMPs to reduce pollutants in storm water discharges.

BMPs may include, but would not be limited to:

1. If grading occurs during the rainy season (Oct. 15 to Apr. 15), storm runoff from the construction area shall be regulated through a storm water management/erosion control plan that shall include temporary on-site silt traps and/or basins with multiple discharge points to natural drainages and energy dissipaters. Stockpiles of loose material shall be covered and runoff diverted away from exposed soil material. If work stops due to rain, a positive grading away from slopes shall be provided to carry the surface runoff to areas where flow would be controlled, such as the temporary silt basins. Sediment basins/traps shall be located and operated to minimize the amount of off-site sediment transport. Any

trapped sediment shall be removed from the basin or trap and placed at a suitable location on-site, away from concentrated flows, or removed to an approved disposal site.

2. To minimize discharge of sediment during storm events, temporary erosion control measures (such as fiber rolls, staked straw bales, detention basins, check dams, geofabric, sandbag dikes, check dams, erosion control blankets, matting, and other fabrics or other ground cover as available) shall be implemented and remain in place until surface sediments can be stabilized.

3. Sediment shall be retained on-site by a system of sediment basins, traps, or other appropriate measures.

4. No disturbed surfaces may be left without erosion control measures in place during the rainy season.

5. Erosion protection shall be provided on all cut-and-fill slopes, as relevant to the MSEP, and shall be initiated as soon as possible after completion of grading and prior to the onset of the rainy season.

6. BMPs selected and implemented for the Project shall be in place and operational prior to the onset of construction on the site. The construction and decommissioning phase facilities shall be maintained regularly and cleared of accumulated sediment as necessary. Effective mechanical and structural BMPs that could be implemented at the Project site include the following:

    a. Mechanical storm water filtration measures, including oil and sediment separators or absorbent filter systems such as the Stormceptor® system, shall be installed within the storm drainage system to provide filtration of storm water prior to discharge.

    b. Roof drains shall discharge to natural surfaces or swales where possible to avoid excessive concentration and channelizing of storm water.

    c. Permanent energy dissipaters shall be included for drainage outlets.

    d. The water quality detention basins shall be designed to provide effective water quality control measures including the following:

        i. Maximize detention time for settling of fine particles;

        ii. Establish maintenance schedules for periodic removal of sedimentation, excessive vegetation, and debris that may clog basin inlets and outlets;

        iii. Maximize the elevation of berms surrounding detention basins to allow the highest amount of infiltration and settling prior to discharge.

7. Hazardous materials such as fuels and solvents used on the construction sites shall be stored in covered containers and protected from rainfall, runoff, vandalism, and accidental release to the environment. All stored fuels and solvents shall be contained in an area of impervious surface with containment capacity equal to or greater than the volume of materials stored. A stockpile of spill cleanup materials shall be readily available at all construction sites. Employees shall be trained in spill prevention and cleanup, and individuals shall be designated as responsible for prevention and cleanup activities.

8. Equipment shall be properly maintained in designated areas with runoff and erosion control measures to minimize accidental release of pollutants.

9. Impervious surface areas shall be graded or constructed to drain to a filtration BMP or equally effective alternative.

WATER-2: The proposed evaporation ponds shall be sized to accommodate operational discharges plus a 25-year storm event, with no less than 1 foot of freeboard.

WATER-3: Comprehensive Drainage, Stormwater, and Sedimentation Control Plan (Plan). The Applicant shall ensure that the Plan is completed prior to the initiation of construction (or decommissioning as relevant), and ensure that recommendations of that plan are implemented.

The Applicant shall ensure that additional stormwater retention measures and facilities, including but not limited to retention basins and other facilities or features designed to retain stormwater on site, shall be implemented within the MSEP site. Stormwater retention facilities shall be designed to accommodate increases in flows that would be generated as a result of MSEP implementation, in comparison to existing conditions, as identified in Table 4.20-2 and 4.20-3, such that MSEP implementation would not result in a net increase in discharge from the site under either a 10-year or 100-year storm event.

At the installation sites for new buildings, roads, the switchyard, transformers, solar panels, the gen-tie line, transmission towers, and other facilities that would be installed in association with the MSEP, designs for these facilities shall be reviewed and approved by the BLM with respect to potential generation of altered stormwater flows, erosion, and sedimentation. The use of flow-obstructing fencing shall be avoided; instead, fencing that allows for the passage of water while minimizing buildup of debris shall be utilized on site. To ensure implementation of Applicant Proposed Measure BIO-1b and Mitigation Measure WIL-1, the Applicant shall coordinate with the BLM, CDFG, and USFWS to determine appropriate fencing design. All proposed grading and impervious surfaces on site shall be reviewed and approved by the BLM, with respect to its potential to cause or result in additional erosion and sedimentation, increased stormwater flows, or altered drainage patterns that could lead to unintentional ponding or flooding on site or downstream, and/or additional erosion and sedimentation. Stormwater flows emanating from proposed impervious surfaces shall be retained on site and/or directed into channels and other stormwater infrastructure, and shall be sized such that unintentional ponding, flooding, erosion, or sedimentation would not occur on site or downstream. Additionally, the number of road crossings over washes shall be minimized and necessary crossings shall be designed to provide adequate flow-through capacity during storm events, up to the 100-year event. In order to minimize disturbance to existing floodplains and natural channels, final facility designs shall be employed which minimize, to the extent practicable, the footprints of roads, parking lots, and other proposed facilities.

WATER-4: In order to ensure that proposed on-site buildings and staff therein are protected from flooding, all on-site buildings and fill areas shall be placed outside of frequent flood flow areas. Additionally, proposed on-site buildings, maintenance areas, designated parking lots, and associated facilities shall be constructed at a finished floor elevation of at least 2 feet above the highest anticipated flood flows during a 100-year event. The proposed evaporation pond shall include berms of levees that reach at least 2 feet above the highest anticipated flood flows during a 100-year storm event, or at least 2 feet above the highest adjacent ground, whichever is greater, in order to protect the evaporation pond from incident flooding events and ensure that the ponds are not inundated by flood flows. Slope protection shall be provided for all fill areas exposed to erosive flows. In specific areas where frequent flows are anticipated, posts for solar panels shall be constructed on a deepened footing, as recommended by the geotechnical engineer, in order to withstand anticipated scouring.

WATER-5: Flood Safety Plan. Prior to initiation of MSEP operation, the Applicant shall complete a Flood Safety Plan for the site. The Flood Safety Plan shall delineate specific actions to be completed during a flood event, in order to protect workers and facilities as relevant. The Plan shall identify refuge areas that would not be susceptible to 100-year flooding, and provide requirements and guidance with respect to avoiding injury, death, or equipment damage during a flood event. The Plan shall be adhered to and updated, as needed, during the entire operation period of the MSEP.

WATER-6: Construction period flood protection. The Applicant shall ensure that during construction, temporary construction related structures such as bridges, roads, berms, and other facilities would be constructed so as to avoid interference with 100-year flood flows. Temporary installation of the following types of facilities shall be avoided: temporary elevated earthen structures such as roads and berms; earthen bridges or other structures within a waterway or flood conveyance that could interfere with flood flows; dams; unnecessary ditches; and other major structures that could concentrate flood flows. Additionally, to the extent practicable, the Applicant shall ensure that the construction process proceeds in a manner so as to minimize exposure of facilities to construction period flooding. Temporary ditches and trenches (such as for pipes, wires, or other infrastructure) shall be completed and backfilled as quickly as possible, and shall not be left open for extended periods. Drainage infrastructure shall be installed prior to installation of the solar arrays and other facilities on site. Other facilities that may be susceptible to flood damage during construction shall be managed so as to minimize construction time of those facilities.

WATER-7: Groundwater Monitoring and Mitigation Plan. A Groundwater Monitoring and Mitigation Plan shall be prepared prior to construction. The Groundwater Monitoring and Mitigation Plan shall be prepared by a qualified hydrogeologist registered in the State of California and submitted by the Applicant to the BLM for approval, and to the RWQCB for review and comment. This Plan shall provide detailed methodology for monitoring background and site groundwater levels, water quality, and flow. Monitoring shall be performed during pre-construction, construction, and operation of the Project, with the intent to establish pre-construction and Project-related groundwater level and water quality trends that can be quantitatively compared against observed and simulated trends near the Project pumping wells and near potentially affected existing private wells, if any. Water quality monitoring shall include annual sampling and testing for constituents as required by the California Department of Health for the proposed on-site potable use.

The Groundwater Monitoring and Mitigation Plan shall include a schedule for submittal of quarterly data reports by the Applicant to the BLM, for the duration of the monitoring period. These quarterly data reports shall be prepared and submitted to the BLM for review and approval, and shall include water level monitoring data (trend analyses) from all pumping and monitoring wells. Based on the results of the quarterly reports, the Applicant and the BLM shall determine if the Project's pumping activities have resulted in water level decline in the baseline at any of the monitoring wells, including nearby private wells, if any. If significant drawdown occurs at off-site wells, the Applicant shall immediately reduce groundwater pumping until water levels stabilize or recover, to a reasonable level.

The Groundwater Monitoring and Mitigation Plan shall also include a schedule for submittal of annual data reports by the Applicant to the BLM, for the first 5 years of the project (including the construction period). These annual data reports shall be prepared and submitted to the BLM for review and approval, and shall include at a minimum the following information:

- Daily usage, monthly range, and monthly average of daily water usage in gallons per day;
- Total water used on a monthly and annual basis in acre-feet; summary of all water level data and water quality data;
- Identification of trends that indicate potential for off-site wells to experience decline of water level; and
- Identification of all sources of water by type (i.e., groundwater, surface water, municipal water) and well/location used on BLM Land.

The BLM shall determine whether groundwater wells surrounding the Project site and Project supply well(s) are influenced by Project activities in a way that requires additional mitigation and, if so, shall determine what measures are needed. After the first 5 years of the Project, the Applicant and the BLM shall jointly evaluate the effectiveness of the Groundwater Monitoring and Mitigation Plan and determine if monitoring frequencies or procedures should be revised or eliminated.

4.20.9 Residual Impacts after Mitigation Incorporated

Residual impacts associated with implementation of the MSEP after mitigation is implemented would include minor adverse impacts for the following categories: (1) surface water quality: minor reduction in water quality during construction, operation, and decommissioning; (2) groundwater quality: minor reduction in groundwater quality during construction, operation, and decommissioning; (3) groundwater level/storage: minor degree of reduction in water levels is expected during construction and operation; (4) drainage and flooding: minor changes during construction, operation, and decommissioning.

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4.21 Wildland Fire Ecology

4.21.1 Methodology for Analysis

This analysis of impacts of the Proposed Action and alternatives on wildland fire ecology assesses the size, location, and environmental setting of the proposed solar plant and ancillary facilities; the number of vehicles that would access the site for construction, operation, maintenance, and decommissioning activities (as such bear on the incidence of human-vehicle and equipment-caused wildfire), and the primary causes of fire in the area, which are lightning and vehicles. Vehicle and equipment estimates are from Section 4.17, *Transportation and Traffic*.

4.21.2 Applicant Proposed Measures

There are no APMs to address potential effects to wildland fire ecology.

4.21.3 Alternative 1: Proposed Action

4.21.3.1 Direct and Indirect Impacts

Construction

During construction, heavy equipment and passenger vehicles driving on vegetated areas prior to clearing and grading could increase the risk of fire. Heated mufflers, any explosives used during site preparation, and improper disposal of cigarettes potentially could ignite surrounding vegetation. Ignition of fuels during construction could occur anywhere in within the Project site or disturbance areas for the gen-tie line and access road. Direct impacts of wildfire would include mortality of plants and wildlife and loss of forage and cover. Annual plants and burrowing wildlife would be less affected in the short term because seeds in the soil and animals under the soil would not likely be consumed. Indirect impacts would result in changes to the vegetation communities and the wildlife supported by these communities. The spread of invasive plants, especially annual grasses, creates an increased potential for wildfires which can result in disastrous ecological change.

The probability of a wildfire to occur as a result of Project construction would be low due to the moderate-risk site conditions, normally extremely patchy fuel distribution, dry climate, and the proposed level of heavy equipment use. However, during extreme weather conditions, a grass fire originating at the site could spread up the slopes of the adjacent McCoy Mountains or spread toward other projects out of control and pose a risk to life and property, and the risk of fire as a result of Project construction therefore is considered substantial.

As described in Section 3.21, the occurrence of wildfires in the area historically has been low; however, repeated fires are known to decrease the perennial plant cover and to aid some invasive annual plants. In turn, where they gain widespread propagation, these invasive plants would provide fuel to carry flames, potentially resulting in larger fires in the future. Surface disturbing activities and vehicle use that promotes the introduction of invasive plants would increase this likelihood. Such impacts could occur within the fence and beyond. If the introduction of invasive, non-native plants is not controlled during construction, over time the Project site could become dominated with non-native plants that tend to increase the frequency and severity of wildfires. The proposed vegetation management measures described in Section 2.3.1.3.11, including a weed management plan, would minimize the potential for weed colonization and dominance on site by including implementation of a risk assessment of the invasive weed species currently known within the study area, procedures to control their spread on site, and procedures to help minimize the introduction of new weed species. Implementation of these measures would not completely eliminate the introduction of noxious weeds into the study area, but would minimize their introduction and control their spread on the Project site. In addition, during construction, a water truck or other portable trailer-mounted water tank would be kept on-site and available to workers for use in extinguishing small man-made fires. Fire watches would be required during hot work on-site. The proposed EAP would designate responsibilities and actions to be taken in the event of a fire or other emergency during construction. The EAP, including fire prevention and suppression, and a worker safety plan would be provided to BLM and local fire departments for approval before the Applicant receives a Notice to Proceed (NTP). The EAP would help reduce the risk of wildfire on and off site during construction. The Applicant has prepared a Fire Prevention Plan (Appendix I) that provides measures for fire prevention during construction and operation of the Project. Mitigation Measure FIRE-1 would require the Applicant to prepare and implement a Fire Safety Plan, as part of its EAP, that expands on this Fire Prevention Plan and incorporates the use of appropriate fire protection equipment, worker training, and consultation with local fire departments to identify appropriate protocols and procedures for fire prevention and early response to minor fire. These measures would minimize the potential for a wildfire ignition to occur as a result of Project-related construction activities and the presence of personnel on site.

Brooks (1998 as cited in BLM, 2002) performed the most in-depth analyses of the correlations between invasive annual plants and environmental disturbance impacts. He found that, despite representing only 5 percent of the annual plant species in the desert, two invasive annual grasses, red brome (*Bromus madritensis ssp. rubens*) and Mediterranean split grass (*Schismus spp*.), and one invasive forb, fileree (*Erodium cicutarium*), accounted for 66 percent of total plant biomass during a high rainfall year. All three species occur in the study area. Invasive annual grasses contributed greatly to fire fuels, and combustion of dry red brome produced flame lengths and temperatures sufficient to ignite perennial shrubs. Brooks also showed that soil nutrients played a significant role and that nitrogen deposition may enhance the rate of invasion.

Wildfire suppression efforts would result in reduced particulate (PM10) production and visibility impairment from smoke and wind-blown dust. Short-term impacts from fire suppression potentially would increase levels of particulate from surface disturbance of firefighting equipment and operations. Firefighting efforts would use minimal ground disturbing techniques such as aerial fire suppression and ground crews with hand tools. Successful fire suppression efforts would minimize the number of acres burned, and result in less vegetative loss, fewer acres susceptible to immediate weed invasion, and less wind erosion of particulate matter.

Operation and Maintenance

Wildfires are rare in the study area, but can be ignited by lightning, human activities, and transmission line-related fire hazards. The increase in daily vehicle use in the area from workers and machines during operation could increase the risk of ignition. Combustible materials that would be stored and used at the solar plant include diesel fuel for vehicles and equipment, and hydraulic fluid in tracker drives, if applicable. Storage and use of these materials would be performed in accordance with applicable fire code and hazardous materials regulations. Vegetation management of the plant site and linear facilities would control noxious weeds and minimize the potential for vegetation that could ignite. During operation and maintenance of the Project, fire protection systems for the solar plant site would include a fire protection water system for protection of the O&M building and portable fire extinguishers. The fire protection water system would be supplied from a 15,000-gallon raw and fire water storage tank located on the solar plant site near the O&M area.

Electrical transmission lines can initiate a fire if an object, such as a tree limb or kite, simultaneously contacts the subtransmission line conductors and a second object, such as the ground or a portion of the supporting pole, or if two conductors make contact. Conductor-to-conductor contact can occur when extremely high winds force two conductors on a single pole to oscillate so excessively that they contact one another. This contact can result in arcing (sparks) that can ignite nearby vegetation. Electrical arcing from power is more prevalent for lower voltage distribution lines than for transmission lines such as those proposed gen-tie lines because distribution lines are typically on shorter structures and in much greater proximity to trees and vegetation. Additionally, lightning strikes on power lines could create power surges that could result in a fire. Fire hazards from transmission lines are reduced through the use of taller structures and wider rights-of-way. CPUC General Order No. 95 and PRC §4293 contain rules and regulations for vegetation clearance surrounding electrical transmission lines. Further, the Applicant would inspect all components of the proposed transmission line at least annually for corrosion, equipment misalignment, loose fittings, and other common mechanical problems.

High-wind conditions are risky for the spread of wildfire. Wind-blown flaming debris from a fire can ignite vegetation in the surrounding area. The Project’s vegetation management measures, fire protection systems, and adherence to building codes relevant to fire safety and other applicable laws and regulations would reduce the potential for wildfire ignition and the potential for a wildfire to spread out of control. The Applicant would be required to comply with vegetation clearance requirements around structures at the site. In addition, temporary and permanent roads across the Project site would break the continuity of fuels at the site, which would slow or stop the progression of potential wildfires originating at the site.

The probability of a wildfire to occur as a result of Project operation would be low due to the moderate-risk site conditions and low level of operational and maintenance activities; however, a wildfire that escapes control and spreads beyond the Project could result in a high level of damage to biological resources and other natural resources, such as air quality and water quality, in addition to the potential for loss of life and destruction of property.

The proposed weed management plan and other vegetation management measures (see Section 2.3.1.4.11) would minimize the potential for weed colonization and dominance on site by implementing a risk assessment of the invasive weed species currently known within the study area, control of their spread on site, and minimizing the introduction of new weed species. Additionally, fire protection would be provided through an EAP which would include fire prevention and suppression measures, thus helping reduce the risk of wildfire on and off site during operation and maintenance.

Climate change would result in a small but general increase in temperature, and also could result in an increase in the frequency of extreme weather events that could generate wildfires, such as increased frequency of drought and heat waves or wetter seasons that increase fuel loads, during operation and maintenance of the Project.

Decommissioning

Impacts from decommissioning would be similar to those described in the construction section.

4.21.4 Alternative 2: Reduced Acreage

4.21.4.1 Direct and Indirect Impacts

Alternative 2 would cause the same types of wildland fire impacts as the Proposed Action. However, the chance for exotic annual weeds to establish and change the fire regime in the Project Area would decrease due to the development of fewer acres (Tetra Tech EC, 2012) resulting from construction of Unit 1 only. Construction and decommissioning workers would be on site for a shorter period of time, reducing the likelihood of wildfire ignition due to their presence and/or activities. During operation and maintenance, fewer employees would be on site, and less maintenance-related vehicle and equipment use would be required. Consequently, the fire-related impacts associated with the construction of Alternative 2 would be reduced relative to the Proposed Action.

4.21.5 Alternative 3: Reconfigured Gen-tie/Access Road Routes

4.21.5.1 Central Route

The Central Route would cause the same types of wildland fire impacts as the Proposed Action Proposed Action, although the location of the impacts associated with the proposed gen-tie route would be shifted to the west relative to the Proposed Action. The Central Route would be shorter than for the Proposed Action, resulting in a slightly shorter duration for construction and decommissioning and, thereby, a slightly reduced potential for accidents or fires to occur. Consequently, the wildland fire-related impacts associated with constructing and decommissioning the Central Route would be slightly reduced relative to the Proposed Action.

4.21.5.2 Western Route

The Western Route would cause the same types of wildland fire impacts as the Proposed Action Proposed Action, although the location of the impacts associated with the proposed gen-tie route would be shifted to the west relative to the Proposed Action. The Western Route would be longer than for the Proposed Action, resulting in a slightly longer duration for construction and decommissioning and, thereby, a slightly increased potential for accidents or fires to occur. Consequently, the wildland fire-related impacts associated with constructing and decommissioning the Western Route would be slightly increased relative to the Proposed Action.

4.21.6 Alternative 4: No Action Alternative

Under this Alternative, no changes would be implemented on the site and the existing environmental setting described in Chapter 3 would be maintained. The plant communities at the Project site would not be expected to change noticeably from existing conditions and therefore, Alternative 4 would not result in the impacts to wildland fire ecology described for the Proposed Action.

4.21.7 Cumulative Impacts

Incremental impacts of the Project could result in a cumulative effect on wildland fire risk in combination with other past, present, or reasonably foreseeable future actions. For purposes of this analysis, the geographic scope of the cumulative effects analysis for fire resources consists of eastern Riverside County, which includes about 2,800 square miles (about 1,792,000 acres). Although potential fires would not be constrained by political boundaries, the natural conditions and existing fire response infrastructure are such that it would be reasonable to assume that a fire could be contained within this area. Impacts to wildland fire ecology from the Project would be likely for the life of the project, including construction, operations, maintenance, and decommissioning phases which could occur over 40 or more years.

Impacts would include a loss of native vegetation cover within the Project area and a tendency for the area to produce more native and exotic weedy annual vegetation. More worker and vehicle activity in and around the Project would increase the chance of wildfire ignitions. Because the plant communities in the study area are not fire-adapted, increases in fire frequency or size would be detrimental to the area's ecology. These are all permanent impacts within the context of the life of the Project. Project features such as vegetation treatment, weed management, and worker safety fire precautions would lower the probability of such ignitions. Direct and indirect effects of the Project are analyzed above.

Past, present, and reasonably foreseeable future actions making up the cumulative scenario are identified in Section 4.1. The installation and operation of transmission lines (such as the existing DPV 1 Transmission Line and lines proposed as part of the Project) and the use of equipment (including motor vehicles) that could spark or otherwise provide an ignition source could combine to cause or create a cumulative impact. Additionally, the increased human presence and disturbance caused by the construction, operation and overall development that would occur under the cumulative scenario could advance the rate of invasion by non-native vegetation and, thereby, contribute to fire fuel-loading that would burn with higher flames and hotter temperatures.

Cumulative impacts would vary by Alternative only to the degree to which direct and indirect impacts would vary by Alternative. In this case, the incremental impact of Alternatives 2 and 3 is not expected to vary materially from the Proposed Action, because similar types of construction, operation and maintenance and closure and decommissioning activities would occur. However, to the extent that development of the site for utility-scale power generation would preclude some OHV use, wildfire risks associated with recreational uses would diminish. For the No Action Alternative, wildfire risks would continue to be associated with OHV and other recreational use of the area.

4.21.8 Mitigation Measures

FIRE-1: The Applicant shall prepare and implement a Fire Safety Plan to ensure the safety of workers and the public during Project construction, operation and maintenance, and decommissioning activities. This plan shall complement or supplement provisions of the Applicant's proposed Emergency Action Plan. The Fire Safety Plan shall be provided to the BLM and RCFD for approval before the Applicant receives a Notice to Proceed (NTP). The Fire Safety Plan shall include, but not be limited to, the following elements:

1. All internal combustion engines used at the Project site shall be equipped with spark arrestors. Spark arrestors shall be in good working order.

2. Once initial two-track roads have been cut and initial fencing completed, light trucks and cars shall be used only on roads where the roadway is cleared of vegetation. Mufflers on all cars and light trucks shall be maintained in good working order.

3. Fire rules shall be posted on the project bulletin board at the contractor's field office and areas visible to employees.

4. Equipment parking areas and small stationary engine sites shall be cleared of all extraneous flammable materials.

5. The Applicant shall make an effort to restrict use of chainsaws, chippers, vegetation masticators, grinders, drill rigs, tractors, torches, and explosives to outside of the official fire season. When the above tools are used, water tanks equipped with hoses, fire rakes, and axes shall easily accessible to personnel.

6. Smoking shall be prohibited in wildland areas and within 50 feet of combustible materials storage, and shall be limited to paved areas or areas cleared of all vegetation.

7. Each Project construction site (if construction occurs simultaneously at various locations) and the proposed solar plant site shall be equipped with fire extinguishers and fire-fighting equipment sufficient to extinguish small fires.

8. The Applicant shall coordinate with the RCFD to create a training component for emergency first responders to prepare for specialized emergency incidents that may occur at the Project site.

9. All construction workers, plant personnel, and maintenance workers visiting the plant and/or transmission lines to perform maintenance activities shall receive training on the proper use of fire-fighting equipment and procedures to be followed in the event of a fire. Training records shall be maintained and be available for review by the RCFD.

10. Vegetation near all solar panel arrays, ancillary equipment, and access roads shall be controlled through periodic cutting and spraying of weeds, in accordance with the Vegetation Management Plan.

11. The BLM and RCFD shall be consulted during plan preparation and fire safety measures recommended by the agencies included.

12. The plan shall list fire prevention procedures and specific emergency response and evacuation measures that would be required to be followed during emergency situations.

13. All on-site employees shall participate in annual fire prevention and response training exercises with the RCFD

14. The Applicant shall designate an emergency services coordinator from among the full-time on-site employees who shall perform routine patrols of the site during the fire season equipped with a portable fire extinguisher and communications equipment. The Applicant shall notify the BLM and County of the name and contact information of the current emergency services coordinator in the event of any change.

15. Remote monitoring of all major electrical equipment (transformers and inverters) will screen for unusual operating conditions. Higher than nominal temperatures, for example, can be compared with other operational factors to indicate the potential for overheating which under certain conditions could precipitate a fire. Units could then be shut down or generation curtailed remotely until corrective actions are taken.

16. Fires ignited onsite shall be immediately reported to BLM FIRE and the RCFD.

17. The engineering, procurement, and construction contract(s) for the proposed project shall clearly state the requirements of this mitigation measure.

4.21.9 Residual Impacts after Mitigation Incorporated

Despite the fire and weed control programs that would be incorporated into the Project, the changes in vehicle use accessing the area for construction, operation, maintenance, and decommissioning would increase the likelihood of wildfires in the Project Area to a slight, but unknown degree. The existing FHSZ classification for this area would likely remain moderate.

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4.22 Additional NEPA Considerations

This section describes the impacts of the Proposed Action and Alternatives on several additional areas of concern under NEPA: livestock grazing, transmission line safety and nuisance, undocumented immigrants, unexploded ordnance, and wild horses and burros.

4.22.1 Applicant Proposed Measures

There are no APMs to address potential effects to the above-listed NEPA considerations.

4.22.2 Transmission Line Safety and Nuisance

4.22.2.1 Methodology for Analysis

This analysis of potential effects of the Proposed Action and alternatives related to Transmission Line Safety and Nuisance assesses the proposal in light of applicable requirements of design-related laws, ordinances, regulations, standards, and policies, including FAA regulations and the Blythe Airport land use compatibility plan. If the gen-tie line and distribution line that would be constructed as components of the Proposed Action and alternatives comply with applicable laws, then the Proposed Action and alternatives would not have a measurable effect related to Transmission Line Safety and Nuisance. Other issues considered include: interference with radio-frequency communication; hazardous shocks; nuisance shocks; and EMF exposure. Impacts related to audible noise from corona discharge are addressed in Section 4.12, *Noise*. Fire hazard-related risks and impacts, including risk of loss, injury or death involving wildland fires sparked by downed lines or other causes, are addressed in Section 4.21, *Wildland Fire Ecology*.

4.22.2.2 Alternative 1: Proposed Action

This analysis focuses on the gen-tie and distribution lines required to serve the Project, and addresses the following issues taking into account both the physical presence of the line and the physical interactions of its electric and magnetic fields:

1. interference with radio-frequency communication;
2. hazardous and nuisance shocks; and
3. EMF exposure.

Interference with Radio-Frequency Communication

The proposed 230 kV gen-tie lines and 12 kV distribution line would be designed, built, and maintained in keeping with standard industry practices that minimize surface irregularities and discontinuities and related corona discharge. Although corona can generate high frequency energy that may interfere with broadcast signals or electronic equipment, this is generally a concern only for lines of 345 kV and above. The IEEE has a design guide that is used to limit conductor surface gradients so as to avoid electronic interference.

Gap discharges or arcs also can be a source of high frequency energy. Gap discharges occur when an arc forms across a gap in loose or worn line hardware. It is estimated that over 90 percent of interference problems for electric transmission lines are due to gap discharges. When identified, gap discharges can be located and remedied by utilities. Although corona or gap discharges related to high frequency radio and television interference impacts would be limited and very localized if they do occur, Mitigation Measure TLSN-1 would reduce the potential for radio frequency interference and provide a mechanism for resolution of any interference complaints.

Hazardous and Nuisance Shocks

Operation of the proposed gen-tie and distribution lines could result in hazardous and/or nuisance shocks. The Applicant would be responsible in all cases for ensuring compliance with regulations and industry standards for grounding-related practices within and near the right-of-way, which would minimize the potential for such shocks.

Electric and Magnetic Field Exposure

Operation of the proposed gen-tie and distribution lines could cause EMF. As discussed in Section 3.22, questions have been raised about EMF and the possibility of deleterious health effects from living near high-voltage lines and about CRT compute monitor interference.

Available evidence as evaluated by the CPUC, CEC, and other regulatory agencies is that a significant health hazard to humans exposed to such fields has not been established (see, e.g., CPUC, 2006). There are no health-based federal regulations or industry codes specifying environmental limits on the strengths of fields from power lines. Most regulatory agencies believe that health-based limits are inappropriate at this time and the industry should continue its current practice of siting power lines to reduce exposure.

The Project site is in an uninhabited open desert land with no existing structures. The proposed gen-tie and distribution line ROW would traverse BLM-administered land and some privately owned and local government-owned land in a largely uninhabited desert area, which has only several residences within 1 mile of the gen-tie line route. The closest residence is approximately 0.6 mile from the proposed gen-tie line, south of I-10. The nearest residence to the proposed solar plant site is approximately 2.6 miles. The general absence of residences in the immediate vicinity of the proposed lines means that there would not be the type of residential field exposure that has been of health concerns in recent years.

Although there is a potential for the Proposed Action to cause CRT computer monitor interference, the proposed gen-tie lines and distribution line would be located on largely uninhabited desert land where computer monitor use is not common. Further, the liquid crystal display (LCD) technology used for portable computer monitors has replaced the CRT technology in most computer monitor applications. Moreover, recognition of computer monitor interference as a problem in the monitor industry has resulted in manufacturers who specialize in shielding enclosures and software programs that adjust the monitor’s vertical refresh rate. Other solutions include relocation of the monitor and replacement of CRT monitors with LCD ones.

4.22.2.3 Alternative 2: Reduced Acreage

Alternative 2 is not associated with a particular gen-tie or distribution line; therefore, it would have no impact related to transmission line safety and nuisance.

4.22.2.4 Alternative 3: Reconfigured Gen-tie/Access Road Routes

Central Route

The Central Route would cause the same types of impacts related to transmission line safety and nuisance as the Proposed Action. The Central Route would be slightly shorter than the proposed gen-tie line and access road route. Consequently, this Alternative would result in a slightly smaller area in which such hazards or nuisances could occur. Nonetheless, there would be no substantial difference in transmission line safety and nuisance-related effects between the Central Route and the Proposed Action.

Western Route

The Western Route would cause the same types of impacts related to transmission line safety and nuisance as the Proposed Action. The Western Route would be slightly longer than the proposed gen-tie line and access road route. Consequently, this Alternative would result in a slightly larger area in which such hazards or nuisances could occur. Nonetheless, there would be no substantial difference in transmission line safety and nuisance-related effects between the Western Route and the Proposed Action.

4.22.2.5 Alternative 4: No Action Alternative

Because Alternative 4 would not involve the construction, operation, maintenance, or decommissioning of a transmission line, it would have no impact related to transmission line safety and nuisance.

4.22.2.6 Cumulative Impacts

Incremental impacts of construction, operation, maintenance and decommissioning of the Project could contribute to a cumulative effect on transmission line safety and nuisance when considered in combination with the transmission lines that would serve the cumulative projects described in Section 4.1, including the existing DPV1 Transmission Line and Blythe Energy Project Transmission Line; future or proposed DPV2 Transmission Line Project, and Desert Southwest Transmission Line; and renewable energy projects under construction or proposed along the I-10 corridor. The cumulative impacts area for potential cumulative transmission line safety and nuisance impacts would include the ROW corridors of the proposed gen-tie and distribution lines as described in Section 2.3. The relevant timeframe within which incremental impacts could interact to cause or contribute to cumulative impacts would begin when the proposed lines are energized and would last for as long as the lines remain in place. This time period likely could extend past the point of site closure and decommissioning of the Project because the lines could accommodate power from nearby electricity generation projects to be constructed in the future.

Existing conditions within the cumulative impacts area reflect a combination of the natural condition and the effects of past actions and are described in Chapter 3. Direct and indirect effects of the Project and alternatives are analyzed above. Past, present, and reasonably foreseeable future actions making up the cumulative scenario are identified in Section 4.1. Due to regulations that limit the allowable proximity of transmission lines to one another and to residences, as described in Section 3.22.1.6, the Proposed Action would not contribute to cumulative impacts related to transmission line safety and nuisance.

Regarding EMF exposure, when field intensities are measured or calculated for a specific location, they reflect the interactive, and therefore cumulative, effects of fields from all contributing conductors. This interaction could be additive or countervailing, depending on prevailing conditions. Because lines constructed, operated, and maintained by all investor-owned utilities (including as SCE) would be subject to EMF management requirements, no significant cumulative effect would result. If no transmission line were developed, pursuit of the alternative would not generate EMF.

4.22.2.7 Mitigation Measures

The following mitigation measures would apply to the construction, operation, and maintenance of any gen-tie line required for the Proposed Action and Alternative 3 to avoid or reduce impacts related to transmission line safety and nuisance:

TLSN-1: The Applicant shall limit the conductor surface electric gradient in accordance with the IEEE Radio Noise Design Guide for High-Voltage Transmission Lines. After energizing the gen-tie line, the Applicant shall respond to and document all radio frequency interference complaints received and the responsive action taken. These records shall be made available to the BLM for review upon request.

4.22.2.8 Residual Impacts after Mitigation Incorporated

After mitigation measure TLSN-1 is implemented, the energized gen-tie lines would not cause effects relating to radio frequency interference that would rise to the level of a nuisance.

4.22.3 Unexploded Ordnance

UXO presents an immediate risk of acute physical injury from fire or explosion resulting from accidental or unintentional detonation. As discussed in Section 3.22, unidentified UXO could be present on the solar plant site or along the proposed linear facilities.

4.22.3.1 Methodology for Analysis

This analysis of the effects of the Proposed Action and alternatives related to UXO relies on review of historical uses of the Project site and proposed linear corridors as well as generally accepted risk information that is readily available from internet sources.

4.22.3.2 Alternative 1: Proposed Action

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

With proper training of site workers in the recognition, avoidance, and procedures to be implemented if suspect UXO are discovered, as required by Mitigation Measure UXO-1, the potential risks to workers from encountering UXO would be reduced, but not completely avoided.

4.22.3.3 Alternative 2: Reduced Acreage

Alternative 2 would cause the same types of impacts related to UXO as the Proposed Action, i.e., impacts related to the risk of exposure to UXO during ground-disturbing activities. However, because the solar plant site would be smaller for Alternative 2 than for the Proposed Action, the construction, operation, maintenance, and decommissioning activities associated with Alternative 2 would occur over a smaller area and, thereby, reduce the likelihood of encountering UXO. With proper training of site workers in the recognition, avoidance, and procedures to be implemented if suspect UXO are discovered, as required by Mitigation Measure UXO-1, the potential risks to workers from encountering UXO would be reduced, but not completely avoided.

4.22.3.4 Alternative 3: Reconfigured Gen-tie/Access Road Routes

Central Route

The Central Route would traverse an area with the potential to encounter UXO. It would be slightly shorter than the proposed gen-tie line and access road route. Consequently, this Alternative would have substantially similar, albeit slightly reduced, impacts related to UXO compared to the Proposed Action. With implementation of Mitigation Measure UXO-1, the potential risks to workers from encountering UXO would be reduced but not completely avoided.

Western Route

The Western Route would traverse an area with the potential to encounter UXO. It would be slightly longer than the proposed gen-tie line and access road route. Consequently, this Alternative would have substantially similar, albeit slightly increased, impacts related to UXO compared to the Proposed Action. With implementation of Mitigation Measure UXO-1, the potential risks to workers from encountering UXO would be reduced but not completely avoided.

4.22.3.5 Alternative 4: No Action Alternative

Alternative 4 would result in no change in the baseline level of UXO-related risks because no ground disturbance would occur in connection with the development of the Project, no Project-related increase in the number of people present on the site or within the transmission corridors would occur, and no change in the current types and intensities of use would result.

4.22.3.6 Cumulative Impacts

Any accidental detonation of UXO would be a site-specific event that would not cause or contribute to a cumulative impact.

4.22.3.7 Mitigation Measures

UXO-1: The Applicant shall prepare and implement a UXO Identification, Training, and Reporting Plan to properly train all site workers in the recognition, avoidance, and reporting of military waste debris and ordnance. The Applicant shall submit the plan to the BLM for review and approval prior to the start of construction. The plan shall contain, at a minimum, the following:

1. A description of the training program outline and materials, and the qualifications of the trainers;

2. Identification of available trained experts that will respond to notification of discovery of any suspected ordnance (unexploded or not);

3. Procedures to stop work immediately in the vicinity of suspected UXO and to notify the local CUPA and the U.S. Army Corps of Engineers;

4. A work plan to recover and remove discovered ordnance, and complete additional field screening, possibly including geophysical surveys to investigate adjacent areas for surface, near-surface or buried ordnance in all proposed land disturbance areas.

5. Documentation of all surveys and investigations performed to evaluate and remove discovered ordnance.

The Applicant shall submit the UXO Identification, Training, and Reporting Plan to the BLM for approval no less than 30 days prior to the initiation of construction activities at the site or within the linear corridors, as appropriate. The results of geophysical surveys shall be submitted to the BLM within 30 days of completion of the surveys.

4.22.3.8 Residual Impacts after Mitigation Incorporated

Implementation of the Mitigation Measure UXO-1 would reduce, but not avoid potential impacts related to UXO.

4.23 Irreversible and Irretrievable Commitments of Resources

4.23.1 Methodology for Analysis

NEPA requires a discussion of any irreversible or irretrievable commitments of resources which would be involved in a proposal should it be implemented. Resources irreversibly or irretrievably committed to by a proposed action are those used or modified on a long-term or permanent basis. An irretrievable commitment of resources includes activities such as the use of nonrenewable resources like metal, wood, fuel, paper, and other natural or cultural resources. These resources are considered irretrievable in that they would be used or modified by a proposed action when they could have been conserved or used for other purposes. An irreversible commitment of resources includes activities such as the unavoidable destruction of natural resources that could not, or would not, be restored.

4.23.2 Direct and Indirect Impacts

Alternatives 1, 2, and 3 would irreversibly and irretrievably commit resources over the 30-year life of the solar plant. After 30 years, the Project would be decommissioned and the land returned to its pre-Project state. This would indicate that potentially some of the resources used on site could be retrieved. However, 30 years is a long time and many variables could affect the Project over that period. It also is debatable as to how well the site could recover to its pre-Project state once it was decommissioned. Open desert lands and sensitive desert habitats can take a long time to recover from disturbances such as development.

The Project is a renewable energy project intended to generate solar energy to reduce reliance on fossil fuels. Over its projected 30-year life, it could contribute incrementally to the reduction in demand for fossil fuel use for electricity-generating purposes. Therefore, this incremental reduction in expending fossil fuels could be a positive effect of the Project’s commitment of nonrenewable resources.

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4.24 Short-term Uses and Long-term Productivity

The BLM NEPA Handbook (H-1790-1 Sec. 9.2.9) and the NEPA Guidelines (40 CFR 1502.16) require a discussion of the relationship between short-term uses of the environment resulting from the proposed action or alternatives and the maintenance and enhancement of long-term productivity of the environment.

Short-term uses of the environment resulting from the proposed action or alternatives are described in Chapter 4, *Environmental Consequences.* Some short-term uses could result in temporary adverse impacts to resources such as air quality and therefore will not impact the long-term productivity of the environment. Other short-term uses such as the loss of sensitive desert habitats could adversely affect the long-term productivity of the area. Mitigation measures are proposed to avoid, minimize, or mitigate activities that impact long term productivity.

It also is important to note that the Proposed Action and build alternatives also could provide an environmental benefit by generating electric power with a minimal increase in the use of non-renewable resources such as fossil fuels. Such a benefit could influence the long-term productivity of the environment.

CHAPTER 5

Consultation, Coordination and Public Involvement

5.1 Interrelationships

BLM's authority for the Proposed Action includes FLPMA (43 USC §1701 et seq.), §211 of the EPAct of 2005 (119 Stat. 594, 600), and BLM's Solar Energy Development Policy of April 4, 2007. The FLPMA authorizes BLM to issue ROW grants for renewable energy projects. Section 211 of EPAct 2005 states that the Secretary of the Interior should seek to have approved a minimum of 10,000 MW of renewable energy generating capacity on public lands by 2015.

The BLM coordinates its fire management activities with the actions of related federal and state agencies responsible for fire management. The Federal Wildland Fire Policy is a collaborative effort that includes the BLM, USFS, NPS, USFWS, Bureau of Indian Affairs, National Biological Service, and state wildlife management organizations. The collaborative effort has formulated and standardized the guiding principles and priorities of wildland fire management. The National Fire Plan is a collaborative interagency effort to apply the Federal Wildland Policy to all federal land management agencies and partners in state forestry or lands departments. Operational collaboration between the BLM, USFS, NPS, and USFWS is included in the Interagency Standards for Fire and Fire Aviation Operations 2003. This federally approved document addresses fire management, wildfire suppression, fuels management and prescribed fire safety, interagency coordination and cooperation, qualifications and training, objectives, performance standards, and fire management program administration.

5.1.1 Department of Defense

BLM coordinates with Department of Defense prior to approval of ROWs for renewable energy, utility, and communication facilities to ensure that these facilities would not interfere with military training routes.

5.1.2 U.S. Army Corps of Engineers

The USACE has jurisdiction to protect the aquatic ecosystem, including water quality and wetland resources under Clean Water Act §404. Under that authority, USACE regulates the discharge of dredged or fill material into waters of the United States, including wetlands, by reviewing proposed projects to determine whether they may impact such resources and, thereby, are subject to the §404 permit requirement. The USACE advised the Applicant by letter dated August 30, 2011, of its determination that no §404 permit would be required for the Project.