DOE/EA-1798

DRAFT ENVIRONMENTAL ASSESSMENT

FOR

DEPARTMENT OF ENERGY LOAN GUARANTEE TO MOJAVE SOLAR, LLC FOR THE ABENGOA MOJAVE SOLAR PROJECT NEAR BARSTOW, CALIFORNIA

U.S. Department of Energy
Loan Guarantee Program Office
Washington, DC 20585

April 4, 2011

TABLE OF CONTENTS

APPENDICES

LIST OF FIGURES

LIST OF FIGURES
(Continued)

LIST OF FIGURES
(Continued)

LIST OF TABLES

LIST OF TABLES
(Continued)

LIST OF TABLES
(Continued)

ACRONYMS AND ABBREVIATIONS

°F	Fahrenheit
ACEC	Area of Critical Environmental Concern
AFC	Application for Certification
AFY	acre-feet per year
amsl	above mean sea level
AMSP	Abengoa Mojave Solar Project
APE	area of potential effects
ATC	Authority to Construct
BACT	best available control technology
BLM	U.S. Bureau of Land Management
BMP	best management practice
B.P	years before present
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CAAQS	California Ambient Air Quality Standards
CAISO	California Independent System Operator
Cal/EPA	California Environmental Protection Agency
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCR	California Code of Regulations
CDC	California Department of Conservation
CDCA	California Desert Conservation Area
CDFG	California Department of Fish and Game
CEC	California Energy Commission
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CH_4	methane
CHU	critical habitat unit
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2e	CO_2 equivalent
CPUC	California Public Utilities Commission
CSP	concentrating solar power
dBA	A-weighted decibel
DC	direct current
DEM	Digital Elevation Model
diesel PM	diesel particulate matter

DOE	U.S. Department of Energy
DOF	U.S. Department of Finance
DT	desert tortoise
DWMA	Desert Wildlife Management Area
EA	environmental assessment
EIS	environmental impact statement
EMF	electromagnetic field
EO	Executive Order
ESA	Endangered Species Act
gen-tie	generation tie line
GETSMP	Golden Eagle Territory Specific Management Plan
GHG	greenhouse gas
GIS	Geographic Information System
gpd	gallons per day
gpm	gallons per minute
GPS	Global Positioning System
HCM	Highway Capacity Manual
HCP	habitat conservation plan
HRA	health risk assessment
HTF	heat transfer fluid
kV	kilovolt
L_{dn}	day-night average noise level
L_{eq}	energy equivalent noise level
LOS	level of service
MACT	maximum available control technology
MBTA	Migratory Bird Treaty Act
MDAB	Mojave Desert Air Basin
MDAQMD	Mojave Desert Air Quality Management District
mg/L	milligrams per liter
MGS	Mohave ground squirrel
mph	miles per hour
MW	megawatt
MWh	megawatt hours
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NCDC	National Climatic Data Center
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSPS	New Source Performance Standards
NWI	National Wetlands Inventory

O_3	ozone
OSHA	Occupation Safety and Health Administration
PM	particulate matter
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
ROW	right-of-way
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SBAIC	San Bernardino Archaeological Information Center
SCE	Southern California Edison
SEGS	Solar Electric Generating Stations
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_x	sulfur oxides
SPS	Special Protection System
SR	State Route
SSA	Supplemental Staff Assessment
SSC	species of special concern
SWHA	Swainson's hawk
SWPPP	Storm Water Pollution Prevention Plan
TAC	toxic air contaminant
TDS	total dissolved solids
TMDL	total maximum daily load
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
V/C	volume-to-capacity
VOC	volatile organic compound
VRM	Visual Resource Management
WBO	western burrowing owl
WEMO	West Mojave Plan
$\mu g/m^3$	micrograms per cubic meter

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SUMMARY

The Energy Policy Act of 2005, as amended by Section 406 of the American Recovery and Reinvestment Act of 2009, authorized the U.S. Department of Energy (DOE) to issue loan guarantees for projects that "avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases; and employ new or significantly improved technologies as compared to commercial technologies in service in the United States at the time the guarantee is issued." Title XVII of the Energy Policy Act of 2005 identifies 10 categories of technologies and projects potentially eligible for loan guarantees, including those for renewable energy technologies. The two primary goals of the Title XVII loan guarantee program are to encourage commercial use in the United States of new or significantly improved energy-related technologies and to achieve substantial environmental benefits.

Mojave Solar, LLC (Mojave Solar), solely owned by Abengoa Solar, Inc., submitted an application to DOE under the federal loan guarantee program pursuant to the Energy Policy Act to support construction of a 250-megawatt (MW) net output solar power plant in San Bernardino County, California. Refer to Figure S-1 for the regional location map of the proposed Project. The proposed solar power plant is located entirely on private land and is referred to as the Abengoa Mojave Solar Project (hereinafter referred to as AMSP). Refer to Figure S-2 for an aerial view of the proposed AMSP site. Additional facilities are required to distribute the solar power to the electric grid, including a new substation and interconnection to the adjacent transmission lines, and a fiber-optic telecommunication line linking various substations in the region. Southern California Edison (SCE) proposes to construct and operate these additional facilities, known as Special Protection System (SPS) upgrades. The SPS upgrades are also evaluated in this environmental assessment (EA) as part of the proposed Project. The AMSP and the associated supporting infrastructure are hereinafter referred to as the "proposed Project."

Approximately 17 miles of the 85-mile proposed fiber-optic telecommunication network crosses lands managed by the U.S. Department of the Interior Bureau of Land Management (BLM). BLM is a cooperating agency for the Proposed Action, in accordance with a Memorandum of Understanding between DOE and BLM, signed in January 2010.

Once constructed and operating at full capacity, the AMSP would produce enough electricity to power approximately 70,000 California homes and provide customers with solar-generated electricity. The proposed Project is expected to supply renewable energy to the California energy market, which would help achieve the State of California renewable energy objectives and support California's electric utility requirements with the long-term production of renewable electric energy. In addition, the proposed Project would maximize renewable energy from a site with excellent solar resources, available water rights, and existing interconnection to an electrical transmission grid.

The proposed Project would promote energy efficiency, reduce reliance on foreign sources of petroleum-based energy, and contribute to the avoidance and reduction of air pollutants and anthropogenic emissions of greenhouse gases, as required by the Energy Policy Act. The

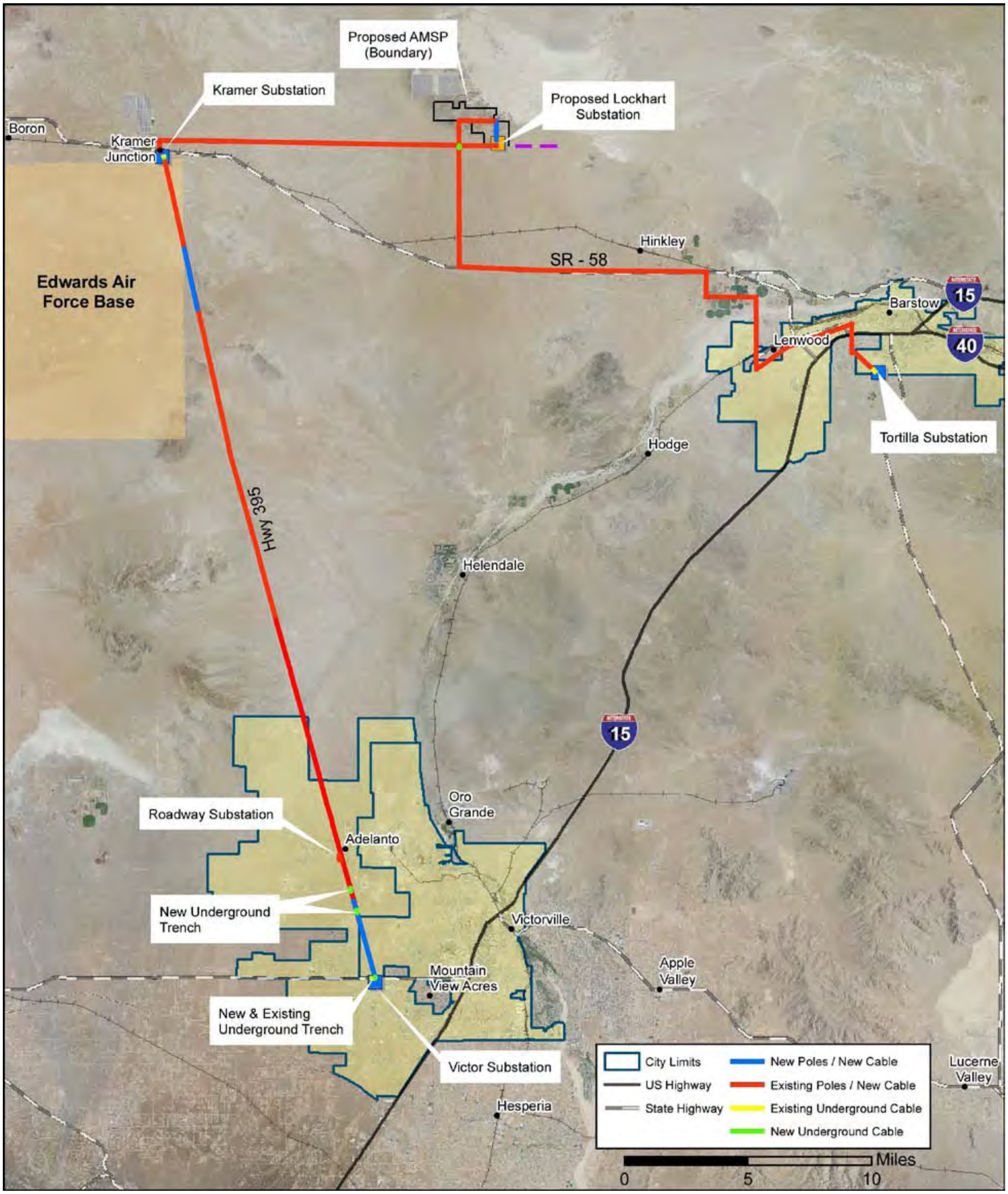


Figure S-1: Regional Vicinity Map

Figure S-2: AMSP Site – View Northwest

proposed Project would reduce the need for electricity from conventional generation facilities and, compared to a traditional fossil fuel-fired facility, would avoid annual emissions of greenhouse gases and other air pollutants.

Under the Proposed Action, DOE would issue a loan guarantee that would allow Mojave Solar to construct and operate the AMSP, which will implement well-established parabolic trough technology to solar heat transfer fluid (HTF). This hot HTF will generate steam in solar steam generators, which will expand through a steam turbine generator to produce electrical power. As noted above, SCE intends to construct a new substation and associated facilities to interconnect the AMSP to various substations in the region; these facilities would be constructed, owned, operated, and maintained by SCE.

Alternatives to the Proposed Action

The No-Action Alternative is evaluated in the EA; no other viable alternatives were identified as described in Section 2.3, Alternatives Considered but Rejected. Under the No-Action Alternative, DOE would not issue Mojave Solar a loan guarantee for the proposed Project and BLM would not grant rights-of-way for the fiber-optic lines necessary to support the proposed Project. Mojave Solar has determined that timelines associated with pursuing financing through commercial debt markets would be inconsistent with construction deadlines established to honor executed commercial agreements. In addition, factors associated with financing through commercial debt markets would preclude the economic viability of the proposed Project due primarily to high debt interest rates and reduced terms of borrowing. Therefore, under the No-Action Alternative, Mojave Solar would not proceed with the proposed Project. If Mojave Solar does not proceed with the proposed Project, the environmental impacts and consequences described in Chapter 3 would not occur. In addition, the No Action Alternative would not employ a new or significantly improved technology that avoids, reduces, or sequesters air pollutants or anthropogenic emissions of greenhouse gases as envisioned in the 2005 Energy Policy Act.

Resources with No Adverse Effect

The EA evaluated the potential for adverse effects to the environment and sensitive resources in Chapter 3.0. The analysis concludes that there will be no adverse effect to the following resources:

- Land Use
- Natural Vegetation
- Environmental Justice
- Transportation
- Floodplains
- Groundwater
- Socioeconomics
- Public Health & Safety
- Cumulative Impacts
- Wetlands

A summary of these findings can be found in Table S-1.

<u>Resources with No Adverse Effect with Implementation of Design Measures, Best Management Practices and Environmental Protection Measures</u>

No Adverse Effect is anticipated for the following resources, with implementation of proposed Project design measures, standard Best Management Practices and environmental protection measures. Many of the environmental protection measures were identified during the CEC's analysis of the AMSP/Lockhart Substation portion of the project pursuant to the California Environmental Quality Act (CEQA) and are requirements pursuant to the CEC's Final License Decision. Those measures were accounted for when making determinations of effect in this EA. A complete listing of these measures is provided for in Appendix S. A summary of the effects are provided in Table S-1.

- Scenic Resources
- Geology and Soils
- Surface Waters
- Special-Status Species
- Noise
- Paleontology
- Wildlife
- Cultural Resources

A beneficial impact to Greenhouse Gas is anticipated since the proposed Project would supply electricity in a manner that avoids, reduces, or sequesters air pollutants or anthropogenic emissions of greenhouse gases. The proposed Project would meet the intent of the 2005 Energy Policy Act.

Table S-1 Summary of Impacts by Resource

Resource Area	No Action Alternative	Proposed Action
Land Use	There would be no change to existing conditions and no impacts to land uses	<u>AMSP/Lockhart Substation</u>: All activities would be within the AMSP site boundary and existing utility corridors. Some farmed land would be removed from production. The proposed Project would not change access or interfere with other existing or potential land uses within the site boundaries and utility corridors. The CEC License Decision (permit) obtained for the AMSP project resolves any conflict with County's General Plan goals and policies regarding inconsistencies with the policies for vegetation clearing, and retention of native vegetation and soils. The proposed facility is compatible and consistent with other federal, state, and county land use policies, plans, and regulations. **No Adverse Effect** <u>Telecommunication System</u>: The 85-miles of proposed fiber-optic telecommunication lines would be located on existing, and in some cases on new interset or replacement poles, within existing utility corridors. The proposed fiber-optic cables would not conflict with land use plans and policies or existing land uses. **No Adverse Effect**

Resource Area	No Action Alternative	Proposed Action
Scenic Resources	There would be no change to existing conditions and no impacts to scenic resources	AMSP/Lockhart Substation: Direct visual impacts include the change from open views of fallow agricultural fields to a commercial-scale solar farm. The impacts would not be substantial or adverse because the AMSP/Lockhart Substation would be visually compatible with the adjacent SEGs. **No Adverse Effect with implementation of Design Measures** Telecommunication System: None of the proposed fiber-optic lines would result in a substantive change to the visual setting or character of the study area. All proposed facilities would be compatible and consistent with other federal, state, and county land use policies, plans, and regulations. **No Adverse Effect**
Air Quality & Greenhouse Gas	There would be no change to existing conditions and no impacts to air quality or contributions to Greenhouse Gas. Consequently, no benefit would be realized in reducing greenhouse gas emissions.	AMSP/Lockhart Substation: The AMSP is not a major source facility for criteria pollutants. Operational emissions from the substation would be limited to emergency generators and occasional maintenance. Sensitive receptors to hazardous air pollutant emissions would not be exposed to substantial pollutant concentrations, including those resulting in a cancer risk greater than or equal to 10 in a million and hazard index greater than 1. **No Adverse Effect with implementation of Design Measures and CEC Conditions of Certification.** Telecommunication System: There would be no new major stationary emission sources; therefore, operation-related hazardous air pollutant emissions would not exposure sensitive receptors to substantial pollutant concentrations. Operational emissions from the transmission lines, and fiber-optic lines would be negligible. Construction emissions are projected to be minimal, however some of the design measures proposed for the AMSP/Lockhart Substation are proposed for the fiber-optic telecommunication system construction phase. **No Adverse Effect** Project[1] Greenhouse Gas. The proposed Project would emit less than 25,000 metric tons CO_2e of GHG emissions per year during construction and operation. It follows from the CEQ GHG guidance that the level of these CO_2e emissions is sufficiently low that no further analysis was warranted. The proposed Project results in a beneficial impact by supplying electricity in a manner that avoids, reduces, or sequesters air pollutants or anthropogenic emissions of greenhouse gases. **No Adverse Effect, Beneficial Impact**
Noise	There would be no change to existing conditions and no impacts to noise	AMSP/Lockhart Substation: Major noise sources during start-up and commissioning involve air and steam venting, and other steam releases. These impacts would not be substantive because they would be short-term and intermittent. There would be no substantial impacts from tonal noise, corona discharge, traffic noise, and operational noise. **No Adverse Effect with implementation of construction phase and operation phase environmental protection measures** Telecommunication System: The fiber-optic lines would not be substantial new noise sources, and are not in audible range of

Resource Area	No Action Alternative	Proposed Action
		sensitive noise receptors, and thus would not result in an adverse impact on the existing or future noise environment. **No Adverse Effect**
Geology, Soils, and Seismicity	There would be no change to existing conditions and no impacts to or hazards related to geology, soils, and seismicity	<u>Project</u> The proposed Project is in a seismically active region. The proposed Project would be designed and constructed to meet International Building Code/California Building Code requirements for industrial facilities. A geotechnical design report addresses geotechnical issues to assist in the design and construction of the proposed Project. For these reasons, the substations would be constructed and operated to minimize adverse effects from seismic and other geologic hazards. An erosion control plan will be developed and implemented to ensure minimum soil loss and to maintain water quality during and following construction; thus, soil erosion would be minor. No other geologic features would be affected. **No Adverse Effect with implementation of standard design measures and Best Management Practices**
Paleontological Resources	There would be no change to existing conditions and no impacts to paleontological resources	<u>AMSP/Lockhart Substation</u>: Quaternary older alluvial sediments that occur within the AMSP/Lockhart Substation area have a high Paleontological Resource Potential for vertebrate fossil types. Full-time monitoring is recommended during any project-related ground disturbance of high potential geologic units. Implementation of the Paleontological Resource Monitoring and Mitigation Plan would substantially reduce adverse impacts. Other geologic units within the AMSP/Lockhart Substation study area have a low Paleontological Resource Potential, and do not require protection or salvage efforts. **No Adverse Effect with implementation of construction-phase environmental protection measures** <u>Telecommunication System</u>: Ground disturbance is projected to be minimal/shallow. No adverse impacts are anticipated, however standard environmental protection measures are proposed for areas where trenching and pole construction would occur. **No Adverse Effect with implementation of standard environmental protection measures**
Surface Water Resources	There would be no change to existing conditions and no impacts to surface water resources	<u>AMSP/Lockhart Substation</u>: Impacts to surface water from soil erosion and spill and leaks of project-related pollutants would be effectively minimized with the implementation of the approved grading plan, BMPs, SWPPP, and Drainage, Erosion, and Sediment Control Plan. No surface water would be used for dust control during construction or for cooling purposes during operation. **No Adverse Effect with implementation of standard construction-phase Best Management Practices** There would be no direct encroachment or impact to wetlands, floodplains or federal waters of the U.S. **No Adverse Effect** <u>Telecommunication System</u>: Trenching locations will not impact jurisdictional waters. For cable installed on existing poles, the fiber-optic cable would span over any known drainages and jurisdictional waters. Approximately 30 interset poles are projected along the Kramer to Victor route. Under a worst-case scenario, new poles would permanently disturb 5 square feet per pole, with a cumulative total of

Resource Area	No Action Alternative	Proposed Action
		less than 0.5 acre of disturbance (roughly 157 square feet). Any impact to drainages/or potential Waters of the U.S. will require authorization from the USACE. Authorization under a Nationwide Permit 12 would be sought to cover potential impacts. **No Adverse Effect** No wetlands occur within the Telecommunication System study area; therefore no impacts to wetlands are anticipated. The existing transmission line along the Lockhart to Tortilla route spans the Mojave River 100-year floodplain where the route nears the City of Barstow. No surface disturbance activities are associated with stringing the fiber-optic line on the existing transmission structures. No new poles would be constructed within the floodplain. No impacts to floodplains are anticipated. **No Adverse Effect**
Ground Water Resources	There would be no change to existing conditions and no impacts to ground water resources	AMSP/Lockhart Substation: Operation would require 2,160 AFY of water (includes 10 AFY for potable water) for an anticipated 30 years. Selected onsite supply wells would provide potable water for employees, and water for cooling tower makeup and other industrial uses. The projected interference to offsite wells located as close as 0.5 mile from the AMSP supply wells would be minor. Groundwater production during operations is not expected to adversely impact groundwater quality. The AMSP/Lockhart Substation results in a beneficial impact to water supply resources as the solar plant will have a substantially lower demand for water than active agricultural uses. **No Adverse Effect** Telecommunication System: No groundwater sources would be impacted from installation of fiber-optic cables. No discharge is proposed and no water use is proposed for these elements. **No Adverse Effect**
Vegetation and Invasive/Exotic Species	There would be no change to existing conditions and no impacts to vegetation and invasive/exotic species	AMSP/Lockhart Substation: Permanent loss of approximately 1,778 acres consists mostly of agricultural, disturbed, or developed areas (1,278 acres) that provide low-quality habitat for special-status plant species. **No Adverse Effect** Telecommunication System: Permanent loss of 20.76 acres (not including disturbed or fallow agricultural lands) is mostly Desert Saltbrush scrub (7.81 acres) and White Bursage scrub (12.8 acres); a majority of this habitat is disturbed from existing utility ROW's and electric transmission line infrastructure and access roads. **No Adverse Effect**
Wildlife	There would be no change to existing conditions and no impacts to wildlife	Project Construction, operation, and maintenance of the proposed Project would cause potential wildlife disturbance, displacement, injury, and mortality. Indirect impacts would occur from loss of habitat, fragmentation, potential for spread of noxious species, and potential effects to avian species from evaporation ponds. **No Adverse Effect with implementation the Biological Resource Mitigation Implementation Monitoring Plan.**

Resource Area	No Action Alternative	Proposed Action
Special-Status Species	There would be no change to existing conditions and no impacts to special-status species	AMSP/Lockhart Substation: No federally or State-listed plants were detected within the AMSP site during protocol surveys. Indirect impacts to special-status plant species existing outside the AMSP/Lockhart site may arise from population fragmentation and the introduction of nonnative weeds. Direct impacts to listed wildlife include habitat loss of 428.4 acres of poor quality DT habitat, MGS habitat, burrowing owl habitat, possible golden eagle foraging habitat, and vehicle strikes of wildlife due to project-related traffic. Indirect impacts to DT and MGS include the possibility of raven predation associated with the installation of evaporation ponds and the deposition of sediment loads that could affect existing DT burrows downstream of the site. Implementation of the Desert Tortoise Clearance and Relocation/Translocation Plan, the Burrowing Owl Monitoring and Mitigation Plan, the Raven Control Plan, and other wildlife species protection measures listed in Appendix S would reduce and mitigate the direct and indirect impacts to these special-status species. No direct impacts to golden eagle or SWHA are anticipated; however potential loss of foraging habitat is addressed in the aforementioned plans. **No Adverse Effect with implementation species-specific protection plans and measures listed in Appendix S.** Telecommunication System: Potential adverse effects as a result of direct long-term disturbance of vegetation and other cover that could be used by special-status species (e.g., foraging) would be avoided through implementation of avoidance and minimization measures in Appendix S. The installation of the fiber-optic lines would have a negligible effect on foraging habitat. Implementation of the Avian Power Line Interaction Committee measures will ensure that impacts to golden eagles are avoided. **No Adverse Effect** Permanent impact to DT habitat (23.1 acres) would be minimized through acquisition of 88.6 acres of potential DT habitat, as described in Section 3.8 and detailed in the Desert Tortoise Clearance and Relocation/Translocation Plan. Permanent impact to MGS habitat (17.63 acres) would be minimized through acquisition of 87.2 acres of potential MGS habitat, described in Section 3.8. **No Adverse Effect with implementation species-specific protection plans and measures listed in Appendix S.**
Cultural Resources	There would be no change to existing conditions and no impacts to cultural resources	Project Through preparation of a Cultural Resources Class III Survey Report and consultation with the BLM, it was determined that the proposed Project would have no adverse effect on the National Old Trails Highway, a historic railroad or historic utility lines. There would be no effect to any other identified archaeological sites. As currently designed, the proposed Project would not result in any adverse effects to historic properties. However, final engineering has not yet been completed so several measures are proposed for

Resource Area	No Action Alternative	Proposed Action
		preservation and avoidance of resources, as listed in Appendix S. Implementation of these measures will assure no adverse effect to important archaeological and historic resources. **No Adverse Effect with implementation of preservation and avoidance measures.**
Socioeconomics	There would be no change to existing conditions and no socioeconomic impacts. However, the No –Action Alternative would not generate short-term construction jobs required for the proposed Project.	<u>Project</u> The proposed Project would have local, regional, and Statewide economic benefits by adding both short- and long-term job opportunities. There would be no adverse effects to the availability of construction labor, employment, or housing. **No Adverse Effect**
Environmental Justice	There would be no change to existing conditions and no impacts to minority or low-income populations	<u>Project</u> The proposed Project would not cause any disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. **No Adverse Effect**
Public Health and Safety	There would be no change to existing conditions and no impacts to public health and safety	<u>AMSP/Lockhart Substation</u>: There would be no impacts from hazardous materials. Normal use and compliance with state and federal standards would minimize the potential impacts to public health. All AMSP employees will apply with applicable Cal/OSHA requirements to maximize worker safety. There are no adverse public health impacts anticipated from emissions of toxic pollutants. Electromagnetic Fields exposures are not expected to result in an adverse impact on public health. **No Adverse Effect** <u>Telecommunication System</u>: The proposed fiber-optic cable would not result in operational public health and safety impacts. **No Adverse Effect**
Transportation	There would be no change to existing conditions and no impacts to traffic volumes or transportation systems	<u>AMSP/Lockhart Substation</u>: Shuttle service would minimize the effects of the construction traffic onto the local roadway network over the 26-31 month construction period. A designated heavy haul route from the Barstow rail yard to the AMSP/Lockhart Substation site would be used for construction traffic hauling materials. Roadway segments are expected to operate at acceptable LOS with the addition of employee traffic. Neither the construction nor the operational phase of the substations would have adverse impacts to the local or regional roadway network. **No Adverse Effect** <u>Telecommunication System</u>: There would be no adverse impacts from construction trips, as the amount of traffic anticipated on existing and new dirt access roads for fiber-optic installation is minimal. Traffic associated with maintenance would be negligible. **No Adverse Effect**
Cumulative Impacts	There would be no cumulative impacts.	The cumulative contribution of impacts from the proposed Project is expected to be negligible. Compliance with regional plans (e.g., air district conformity guidelines and West Mojave Plan) minimizes adverse effects from individual projects and thereby reducing the cumulative effects on environmental resources. **No Adverse Effect**

[1] Project = AMSP/Lockhart Substation and Telecommunication System Combined.

1.0 PURPOSE AND NEED FOR AGENCY ACTION

The purpose and need for agency action is to comply with the DOE mandate under the Energy Policy Act by selecting eligible projects that meet the goals of the Act. DOE is using the National Environmental Policy Act of 1969 (NEPA) process and this environmental assessment (EA) to help determine whether to issue Mojave Solar a loan guarantee to support the proposed Project (the Proposed Action).

Mojave Solar submitted an Application for Certification (AFC) for the AMSP to the California Energy Commission (CEC) on August 10, 2009. CEC issued the final CEC License Decision ("CEC Decision") on September 8, 2010. The CEC Decision, including the Conditions of Certification, was taken into account in preparation of this EA. This EA incorporates all of the CEC Conditions of Certification. In addition, mitigation measures would be specified in the U.S. Department of the Interior Bureau of Land Management (BLM) right-of-way (ROW) plans of development, and in other compliance provisions required by DOE resulting from the findings of this EA.

Approximately 17 miles of the 85-mile proposed fiber-optic telecommunication network (SPS upgrades) crosses lands managed by BLM, as described more fully in Section 2.1.2. BLM is a cooperating agency for the Proposed Action, in accordance with a Memorandum of Understanding between DOE and BLM, signed in January 2010. BLM's purpose for the Proposed Action is to permit transmission and other ancillary facilities on public lands in support of renewable energy projects, consistent with the Energy Policy Act and subsequent renewable energy policies, other laws and regulations, and the California Desert Conservation Area Plan. BLM's need for the Proposed Action is to respond to SCE's applications under Title V of the Federal Lands Policy and Management Act (43 United States Code [U.S.C.] 1761) for five ROW grants to support the proposed AMSP. These include modifications to three existing grants—CACA 021596, CALA 030913, and CARI 001280—as well as two new grant applications (CACA052096 and CACA-52616) to install the fiber-optic telecommunication systems to provide transmission protection, monitoring, and remote operations capabilities of the electrical equipment at the proposed Lockhart Substation within the proposed AMSP. BLM's Proposed Action is to issue the ROW grants sought by SCE to support the AMSP, and to provide appropriate receiving sites for the desert tortoises translocated from the AMSP/Lockhart Substation site and utility corridors, if necessary. These actions are located on BLM administered land under the jurisdiction of the Barstow Field Office.

Five ROW applications have been submitted to BLM for the three upgrades and two new transmission line authorizations, and a draft Desert Tortoise Clearance and Relocation/ Translocation Plan for desert tortoise has been submitted to BLM for its review and approval. Several biological resource management areas exist near and overlap with the telecommunication routes, including the Superior-Cronese and Fremont-Kramer DWMAs, both of which were established to protect desert tortoise and their habitat as part of the 1994 Desert Tortoise Recovery Plan (USFWS 2008). The telecommunication routes are partially located within both DWMAs and desert tortoise critical habitat. These resource management areas were considered in the biological resource impacts analysis, and environmental protection measures would be specified in the BLM ROW plans of development, and in other compliance provisions required by the DOE resulting from the findings of this EA.

1.1 Scope of the Environmental Assessment

This EA provides information about the potential impacts associated with issuing Mojave Solar a loan guarantee that would be used for the construction and operation of the AMSP, the Lockhart Substation and interconnection, and associated communication facilities (the "Proposed Action"). This EA has been prepared in accordance with NEPA (42 U.S.C. 4321 et seq.), the Council on Environmental Quality (CEQ) NEPA-implementing regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508), and DOE NEPA -implementing procedures (10 CFR 1021). If DOE does not identify significant impacts during preparation of this EA, the agency will issue a Finding of No Significant Impact. If DOE identifies potentially significant impacts, the agency will prepare an environmental impact statement (EIS).

This EA (1) describes the affected environment relevant to potential impacts of the Proposed Action and No-Action Alternative; (2) analyzes potential environmental impacts that could result from the Proposed Action and its alternatives; (3) identifies and characterizes cumulative impacts that could result from the Proposed Action or alternatives in relation to other ongoing or proposed activities in the surrounding area; and (4) provides DOE with environmental information for use in decision-making to protect, preserve, and enhance the human environment and natural ecosystems while at the same time allowing for resource use.

1.2 Public Participation

Under CEQ NEPA regulations, scoping is not formally required for the preparation of an EA (40 CFR Part 1501) but is encouraged. Since April 2008, Mojave Solar has engaged representatives from nearby cities; the County of San Bernardino; federal, state, and local agencies; and stakeholder and public groups. A record of public contact is provided in Appendix A. In addition, Mojave Solar conducted a public participation program as part of its state and local permitting requirements, including public meetings required by CEC. Public outreach efforts focused on distributing information and soliciting input from the public and interested stakeholders. Information-sharing opportunities included a project kick-off meeting, one-on-one briefings, stakeholder meetings, open houses, a project website, a fact sheet, and telephone information. Table 1-1 summarizes the public outreach efforts.

Table 1-1: Public Outreach Summary

Date	Venue/Location	Time	Notice	Attendance
October 15, 2009	San Bernardino County Fairgrounds 28th Annual High Desert Opportunity Day; Information Booth	7:30 am – 3:00 pm	Part of Opportunity Day; notices in local newspapers	900 participants to fairgrounds; steady draw of attendees to information booth

Date	Venue/Location	Time	Notice	Attendance
December 8, 2009	California Energy Commission, Public Workshop, Sacramento, CA	10 am	Notice published November 19, 2009, on CEC website	Approximately 30 participants, including staff and public
December 9, 2009	Barstow City Hall	1 pm Site Tour 3 pm Public Meeting	Public Advisor's Office, California Energy Commission	90 participants
April 6 and 7, 2010	California Energy Commission, Public Workshops, Sacramento, CA and Barstow, CA	10:15 am, April 6 1:00 pm, April 7	Notice published March 16, 2010, on CEC website	20 attendees
August 23, 2010	Application for Certification Hearing 1516 9th Street, Hearing Room B, Sacramento, CA	1:05 pm	Notice published August 6, 2010, on CEC website	17 attendees

Issues and concerns were identified and addressed throughout the CEC process, and are also reflected in this EA. Table 1-2 summarizes the topics of concern raised during the CEC AFC process and provides a brief response to each issue identified during the public participation effort.

Table 1-2: Summary of Issues and Concerns Identified during Public Outreach

Concern	Response
Cumulative impacts on desert tortoise habitat	Project has only marginal effect on desert tortoise habitat and all adverse impacts will be avoided, minimized, and fully compensated.
Surveys conducted for the desert tortoise and Mohave ground squirrel	Protocol surveys conducted for desert tortoise. Mohave ground squirrel surveys conducted in 2007.
Cumulative impacts on the Bureau of Land Management (BLM) watchable wildlife (marsh) area	Project will have no impact on watchable wildlife area. Water supply and viewing area will be maintained. Access road will be improved.
Cumulative impacts on the Harper Dry Lake bed ecosystem	Project will have no effects on lake bed. Drainage discharges will be unaffected.
Construction of the cooling water disposal ponds: ambient temperature or heated? Covered or open?	Cooling ponds will be ambient temperature. Ponds will employ methods and devices to exclude wildlife.
Wastewater discharge: location/direction of discharge? Recycled for the cooling of the towers?	Process wastewater will be recycled approximately 5.8 times in the cooling towers, then reused approximately 38 times prior to discharge to the evaporation ponds. No offsite discharge is proposed.
Impacts to natural habitats and wildlife along the southwestern edge of Harper Dry Lake and the Harper Dry Lake Area of Critical Environmental Concern	Lakeshore will not be impacted. No effects on wildlife or habitat along lake edge.
Impacts resulting from the overuse of naturally occurring groundwater for power plant cooling	Results of groundwater modeling are contained in the AFC. Quantity of groundwater used is managed by the Watermaster and Mojave Water Agency for the protection of the Mojave Basin Area.

Concern	Response
Selection of concentrating solar power (CSP) technology for the AMSP because existing solar plants (Solar Energy Generating Stations 8 and 9) use CSP	CSP, especially with advances in receiver tube design, piping technology, and mirrors, is the most cost-effective means of providing solar electric energy to the public in this area.

1.3 Document Organization

This EA is organized as follows:

- Chapter 1, Purpose and Need for Agency Action, describes the purpose of and need for the proposed DOE and BLM actions and the scope of the analysis, and summarizes the public participation program for the project. It also describes the organization of the EA.
- Chapter 2, Proposed Action and Alternatives, describes the Proposed Action (issuance of a DOE loan guarantee and BLM ROWs to support the proposed Project), alternative locations considered but eliminated, and the No-Action Alternative.
- Chapter 3, Affected Environment and Environmental Consequences, describes the existing baseline conditions of the resources the Proposed Action could affect (including land use, visual resources, air quality and climate, noise, geology and seismicity, paleontological resources, water resources, biological resources, cultural resources, socioeconomics and environmental justice, public health and safety, and transportation) and the potential social, economic, and environmental effects associated with the Proposed Action and No-Action Alternative.
- Chapter 4, Cumulative Effects, describes potential impacts to the environment from the incremental impact of the Proposed Action when added to other past, present, and reasonably foreseeable future actions.
- Chapter 5, List of Preparers, identifies the persons who prepared the EA and provides a brief description of their experience and credentials.
- Chapter 6, List of Agencies and Native American Tribes Contacted, identifies agencies and Native American tribes contacted regarding this EA.
- Chapter 7, References, lists the sources of information used to prepare this EA.
- Appendices A through S provide supporting information.

1.4 Availability of the Environmental Assessment

DOE will distribute this EA to the California Governor's Office of Planning and Research; San Bernardino County Planning and Development Department; City of Barstow; City of Adelanto; and other local, state and federal participating agencies, as well as interested Native American tribes for review and comment. A complete copy of the EA and associated appendices will be available on the DOE website: http://lpo.energy.gov/?page_id=1514.

2.0 PROPOSED ACTION AND ALTERNATIVES

This chapter describes the Proposed Action, alternatives considered but eliminated from analysis, and the No-Action Alternative.

2.1 Proposed Action

The DOE Proposed Action is to issue Mojave Solar a loan guarantee that would be used for the construction and operation of the AMSP, including necessary supporting infrastructure. The BLM Proposed Action is issuance of ROWs to support the AMSP. The AMSP would be a 250-MW net output parabolic trough solar power-generating plant (solar thermal plant), located on private land approximately 25 miles northwest of the City of Barstow, California. Presently, the area is predominantly fallow agricultural land and was originally sited as Solar Electric Generating Stations (SEGS) XI and XII, located next to the existing SEGS VIII and IX facilities. Composed of approximately 1,765 acres, the AMSP site is generally north of the cities of Victorville and Adelanto, northwest of Barstow, south of Fremont Peak and the Black Mountains, and north and east of the Southern California Logistics Airport (formerly George Air Force Base) within unincorporated San Bernardino County. Figure S-1 shows the location of the AMSP property and ancillary facilities.

The Proposed Action would result in development of the AMSP, as well as a proposed substation, interconnection to an existing transmission line, and fiber-optic telecommunication lines linking the plant to various substations in the region. It would also involve movement of desert tortoise from the AMSP and ancillary sites to receptor sites outside of the plant site boundary. Hereinafter, these elements of the Proposed Action are collectively called the “proposed Project.” The AMSP and the ancillary facilities are described in detail in Sections 2.1.1 and 2.1.2, respectively. The “project owner” for the AMSP is Mojave Solar and the “project owner” of the SPS upgrades (substation, interconnection, and telecommunication system) is SCE.

As noted above, the proposed Project includes several ancillary facilities required to connect the AMSP to SCE’s electric grid for distribution. The Lockhart Substation, interconnection to the existing transmission grid, and the telecommunication system (SPS upgrades) are required for proposed Project operations. The proposed Lockhart Substation and interconnection to the adjacent SCE power lines are located on the 1,765-acre AMSP site and the land adjacent and south where it connects to the existing east-west SCE power lines. The fiber-optic telecommunication system diverges from the AMSP/Lockhart Substation site into three directions covering approximately 85 miles of corridors. In addition to these two geographic study areas, the translocation of desert tortoise would occur offsite at receptor areas. The project description is organized into three geographic areas: (1) the AMSP/Lockhart Substation (which also includes the interconnection to the power grid); (2) the fiber-optic telecommunication system; and (3) the desert tortoise translocation receptor sites. The project description is therefore addressed in Sections 2.1.1 through 2.1.3.

2.1.1 Abengoa Mojave Solar Plant/Lockhart Substation

Abengoa Mojave Solar Plant (AMSP)

The AMSP would have a combined nominal electrical output of 250 MW from twin, independently operable solar fields, each feeding a 125-MW power island. The AMSP plant sites, identified as Alpha (the northwest portion of the AMSP/Lockhart Substation site) and Beta (the southeast portion of the AMSP/Lockhart Substation site), would be 884 acres and 800 acres, respectively, and joined at the transmission line interconnection substation to form one full-output transmission interconnection. An additional 81 acres shared between the plant sites would be used for receiving and discharging offsite drainage improvements.

As noted above, several project components are located offsite but are part of the Proposed Action because they would facilitate the transmission and delivery of energy generated from the AMSP. They would also provide the necessary communications mechanism to regulate the flow of energy between the AMSP and the SCE transmission system. These components are addressed in Section 2.1.2 (Lockhart Substation, Interconnection, and Telecommunications).

The proposed Project includes interconnection to the Coolwater–Kramer No. 1 220-kilovolt (kV) transmission lines, which are owned by SCE and located adjacent to the southern border of the AMSP site. The Interconnection System Impact Study was completed in coordination with the California Independent System Operator (CAISO) and is located in Appendix B. The Interconnection Facilities Study (Draft, October 30, 2009) details the on-the-ground systemwide improvements associated with the AMSP. As a separate process, SCE will lead the permitting effort for the transmission improvements beyond the project-specific interconnection to the Statewide system.

The AMSP would use wet cooling towers for power plant cooling; Mojave Solar owns adjudicated water rights for this purpose. Refer to the subsection on Water Supply, Quality, and Use under Section 2.1.1.1 for detailed solar plant water information.

Natural gas for the AMSP's ancillary purposes, such as the auxiliary boilers for freeze protection and space heating, would be supplied by a Southwest Gas Corporation-owned pipeline that runs to the AMSP site boundary near the proposed Alpha power island. No offsite pipeline facilities are proposed for the AMSP. Southwest Gas Corporation was contacted and studied the demand requested and indicated that sufficient capacity exists to supply the AMSP. Confirmation from Southwest Gas Corporation is included in Appendix C.

2.1.1.1 Description

The following provides a basic description of the proposed solar plant site arrangement and the processes, systems, and equipment that constitute the AMSP. Additional details regarding the major solar equipment and materials, wastewater and cooling systems, waste generation and management, civil and structural features including the solar steam generator system, steam turbine generator and associated equipment, solar array support structures, buildings, water storage tanks, roads, fencing, security, and decommission of the AMSP (both interim and long-term) are provided in Appendix D, Solar Plant Details.

The AMSP would implement well-established parabolic trough technology to solar heat HTF. This hot HTF would generate steam in solar steam generators, which would expand through a steam turbine generator to produce electrical power. The sun would provide 100 percent (%) of the power supplied to the AMSP through solar thermal collectors; no supplementary fossil-based energy source (e.g., natural gas) would be used for electrical power production. However, each power island would have a natural gas-fired auxiliary boiler to provide equipment freeze protection and HTF freeze protection. The natural gas supply for the auxiliary boiler for equipment and HTF freeze protection is discussed in detail in Appendix D. The auxiliary boiler would supply steam to HTF heat exchangers as needed during offline hours to keep the HTF in a liquid state when ambient temperatures fall below its freezing point of 54 degrees Fahrenheit (°F). Each power island would also have a diesel-engine-driven firewater pump for fire protection and a diesel-engine-driven backup generator for power plant essentials.

All plant facilities would be designed, constructed, and operated in accordance with applicable laws, ordinances, regulations, and standards. The generating facilities described in this section, along with the associated construction/operating footprint, all occur within the approximately 1,765-acre plant site boundary depicted in Figure 2-1.

The arrangement of the facility and solar plant components are illustrated in Figures 2-2 through 2-5 and include the following:

- Overall AMSP area and facilities footprints
- Two separate power island areas, one each for the Alpha and Beta plant areas
- Construction laydown locations
- Solar collector field arrangement
- Evaporation ponds for each plant area
- Bioremediation/landfarm unit for each plant area
- Onsite transmission and interconnection facilities with interconnection location adjacent to Beta plant area
- Onsite gas pipeline facilities with connection point to existing pipeline
- Drainage improvements to convey offsite storm water around the AMSP
- Groundwater well locations used for water supply
- Access roads

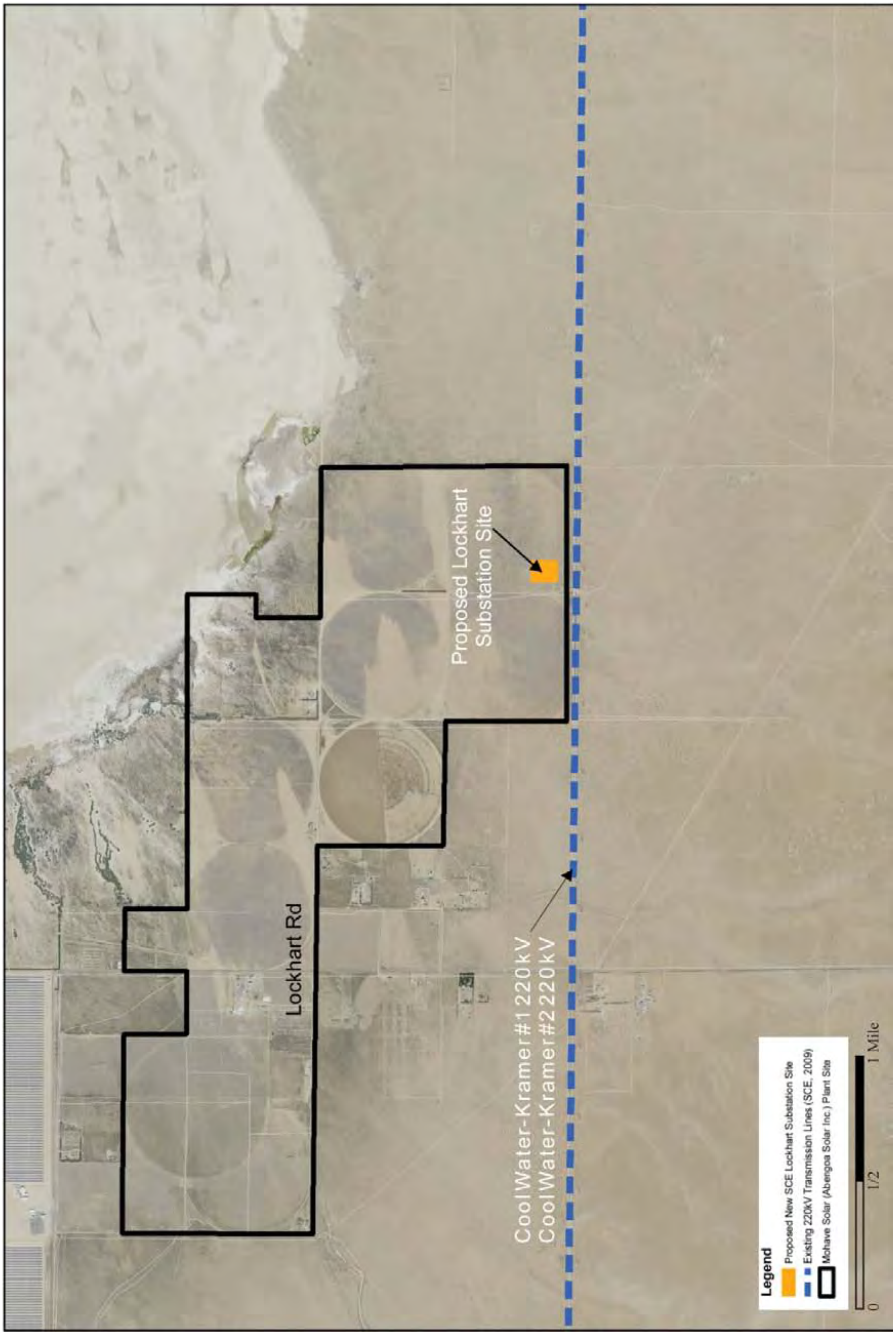


Figure 2-1: AMSP/Lockhart Substation Site

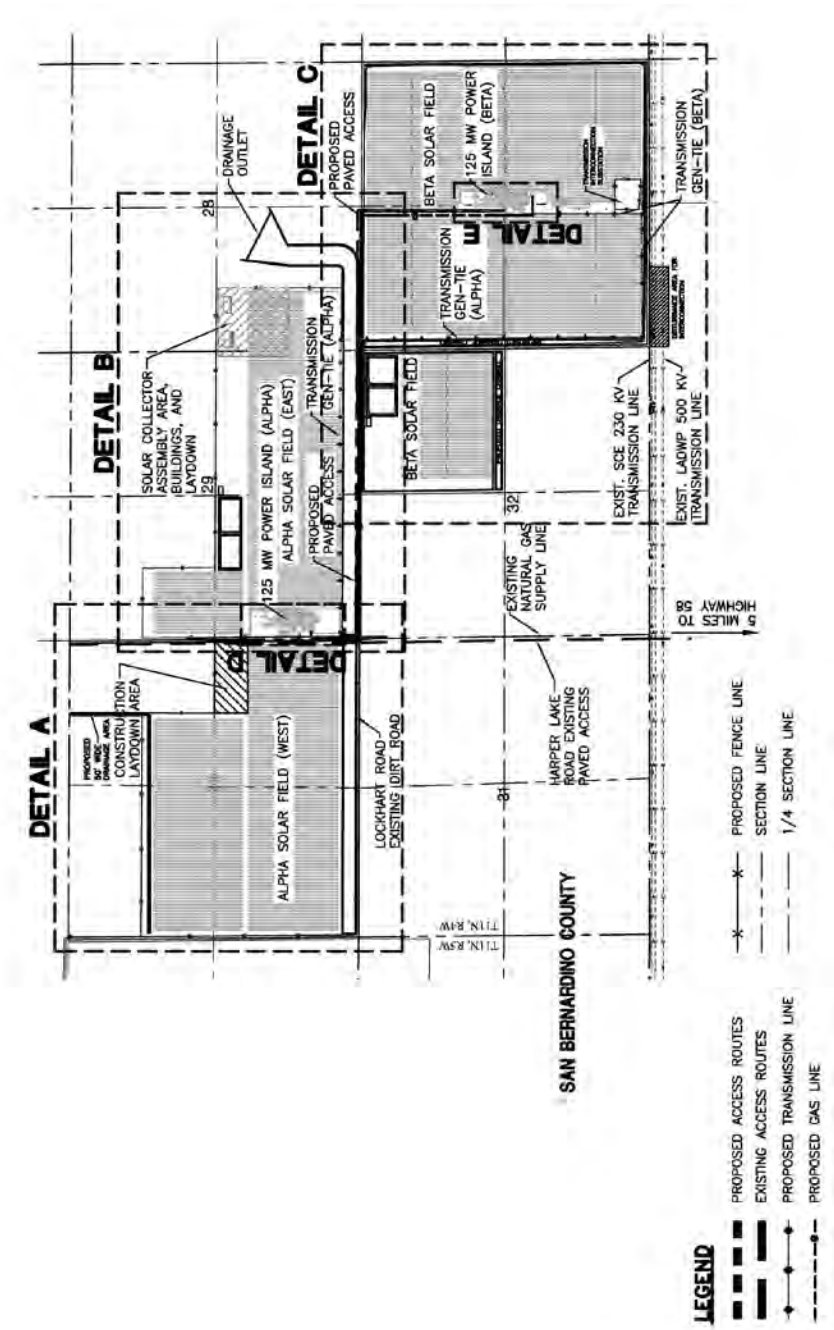


Figure 2-2: AMSP Site Plan

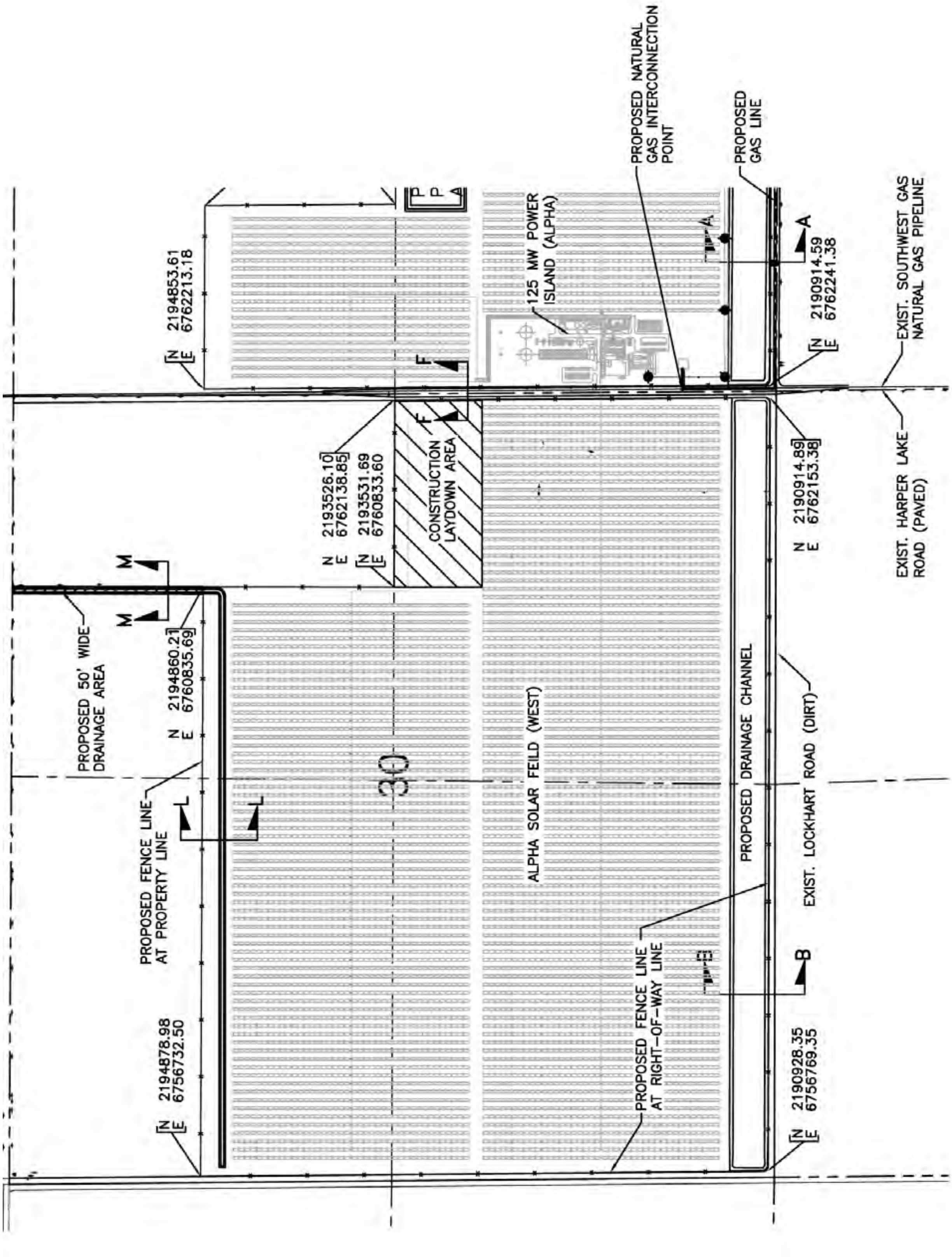


Figure 2-3: Alpha Solar Field – West

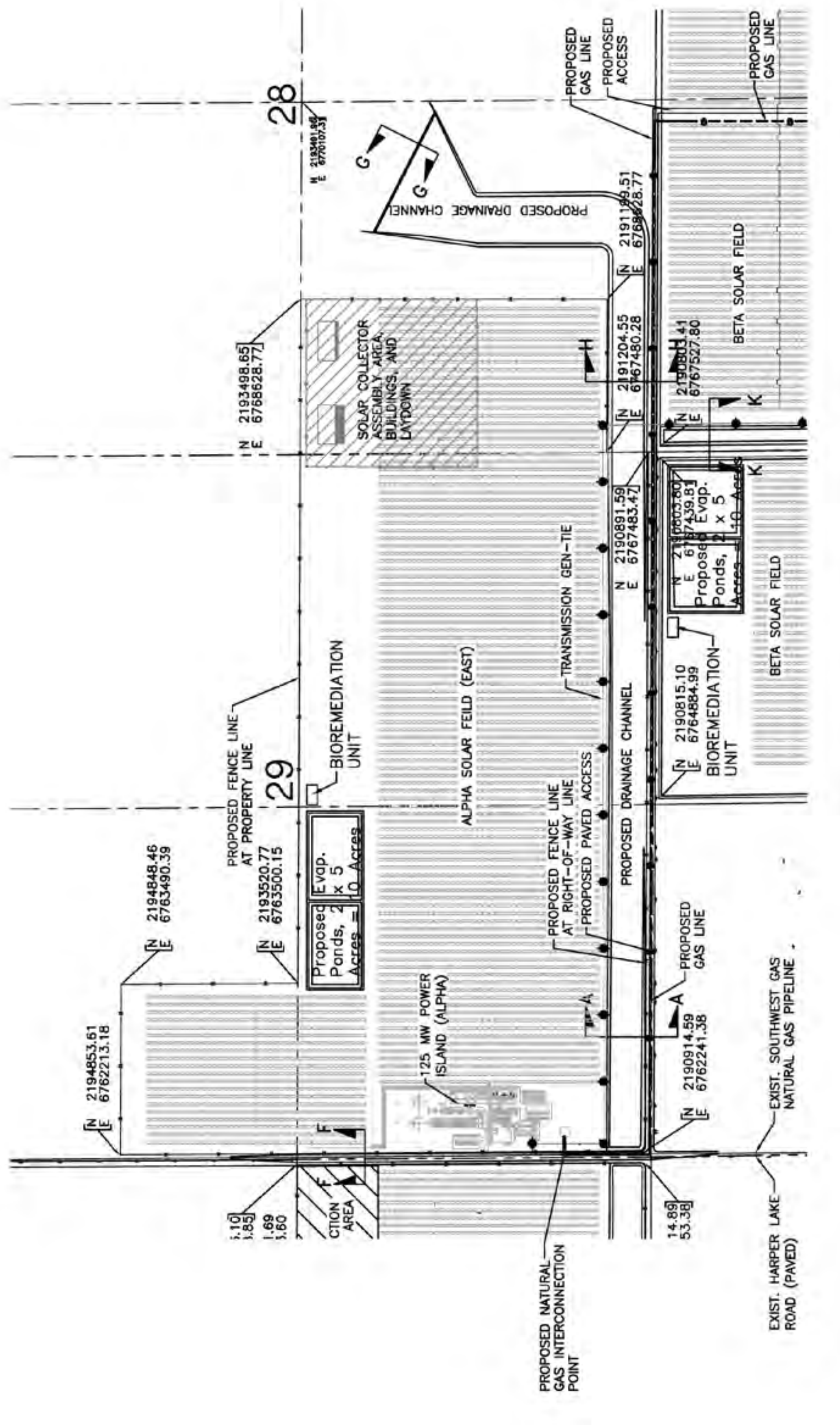


Figure 2-4: Alpha Solar Field – East

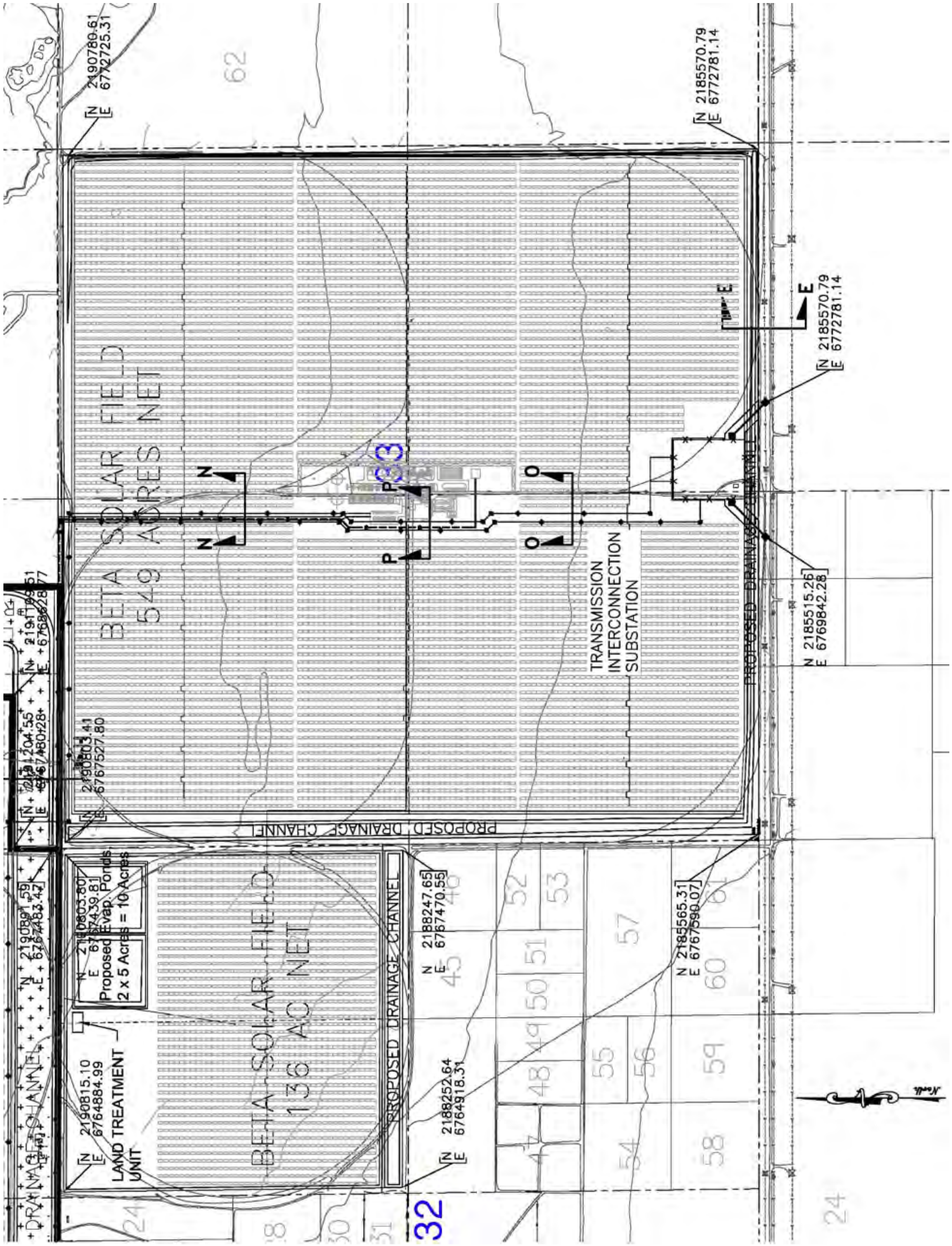


Figure 2-5: Beta Solar Field

Elevation drawings of the proposed plant facilities are provided in Figure 2-6 and Figure 2-7. Each elevation represents a view of the power island area and a representative portion of the solar collector arrays.

Description of Technology

The proposed collector fields would be made up of two large fields (i.e., the previously described Alpha and Beta fields) of single-axis-tracking parabolic trough solar collectors. These collectors are modular and are composed of many parallel rows of solar collectors, aligned on a north/south axis (see Figure 2-2). Each solar collector has a linear, parabolic-shaped reflector that focuses the sun's radiation on a linear receiver known as a heat collection element located at the focus of the parabola.

The collectors would track the sun from east to west during the diurnal cycle to ensure that the maximum amount of the sun's radiation is continuously focused on the heat collection element. The HTF would be heated to approximately 740°F as it circulates through the heat collection elements and returns to a series of heat exchangers where the fluid is used to generate steam in the solar steam generator system at the power island, providing steam to the plant's steam turbine generators.

Water Supply, Quality, and Use

The AMSP's various water uses would include makeup for the circulating water system and cooling tower, makeup for the solar steam generator, water for solar collector array washing, service water, potable water, and fire protection water. A water balance diagram corresponding to peak summer operation (106°F dry bulb/72°F wet bulb/140-MW gross plant output) and average annual operation (79°F dry bulb/58°F wet bulb/105-MW gross plant output) of each plant site is presented in Figure 2-8.

The estimated water requirements for the power plant's various water uses are presented in Table 2-1. They include the average, peak, and annual usage for the combined 250-MW plant site and are based on the modeled annual net production. Equipment sizing would be consistent with peak (design) daily rates to ensure adequate design margin. Detail of the water uses and the treatment processes is contained in Figure 2-8, including process water, cooling water, and solar collector array washing.

Table 2-1: Water Use (Alpha and Beta Plant Sites Combined)

Water Use	Average Rate (Gallons/Minute)	Peak Rate (Gallons/Minute)	Estimated Annual Use (Acre-Feet)	Estimated Maximum Annual Use (Acre-Feet)
Plant Operation	1,340 [1]	2,190 [1]	1,700	2,160 [1]
Potable Water	6.2	6.2	10, max	10

[1] Rounded up.

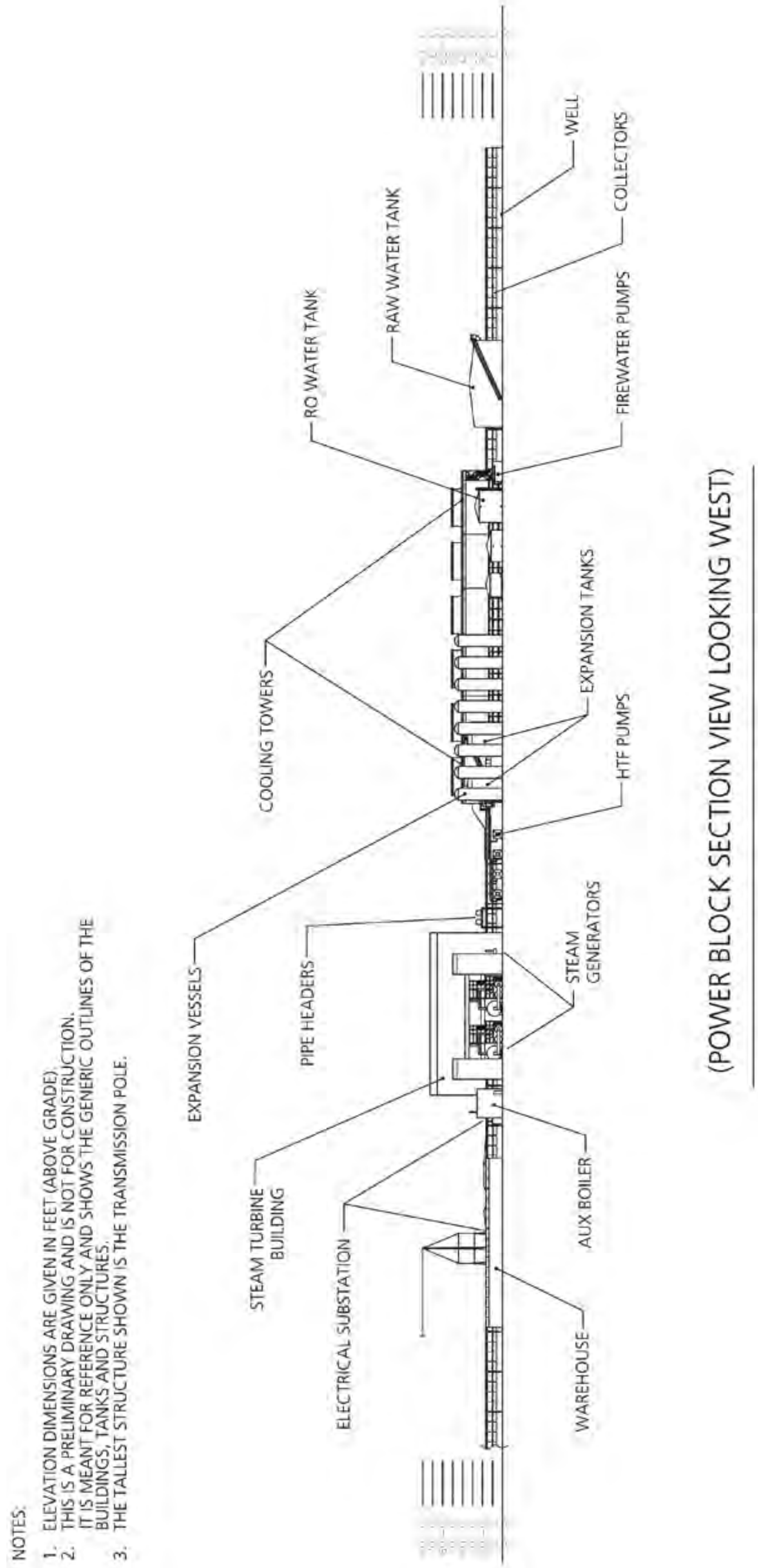


Figure 2-6: Section View Looking West

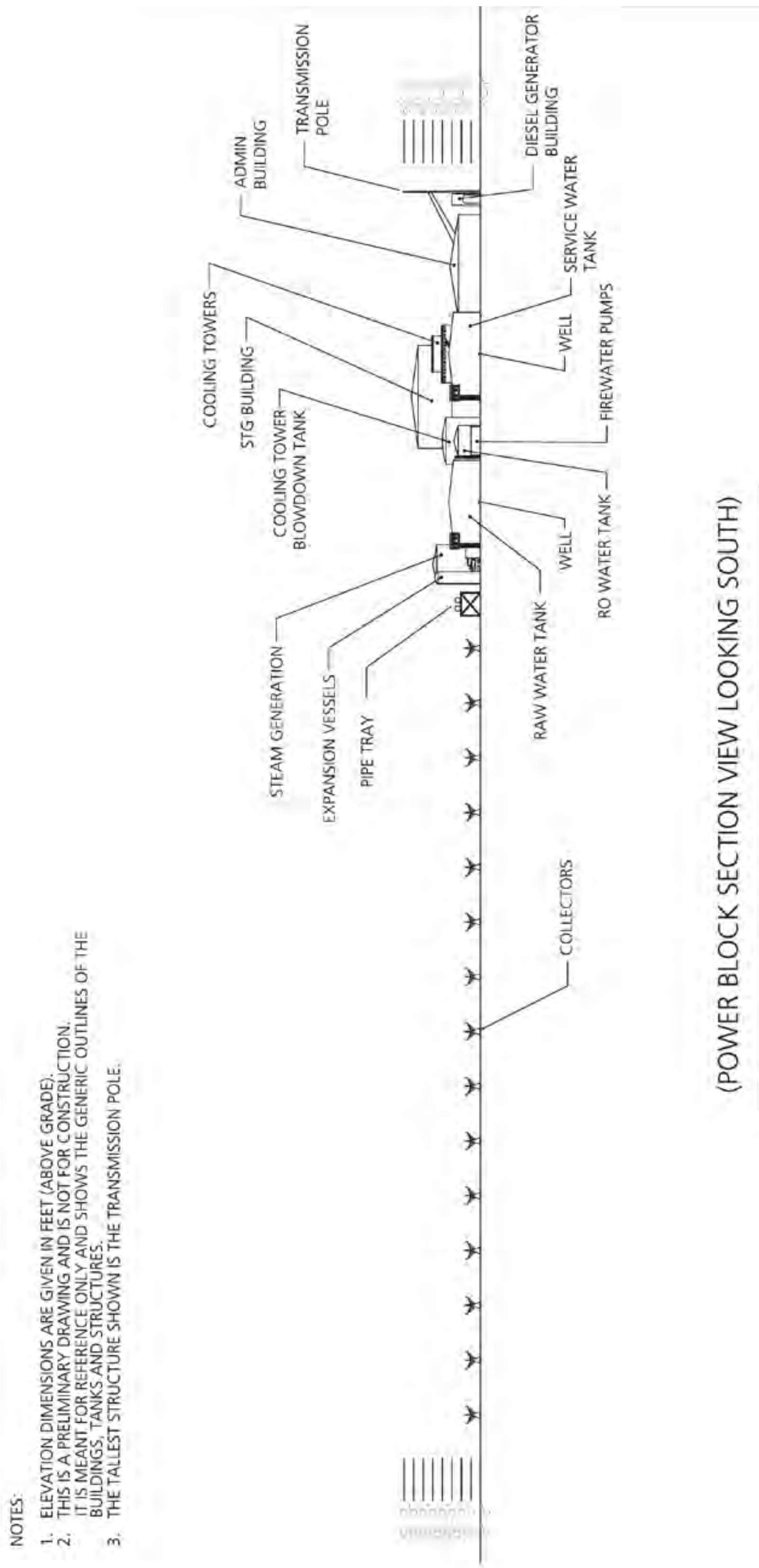
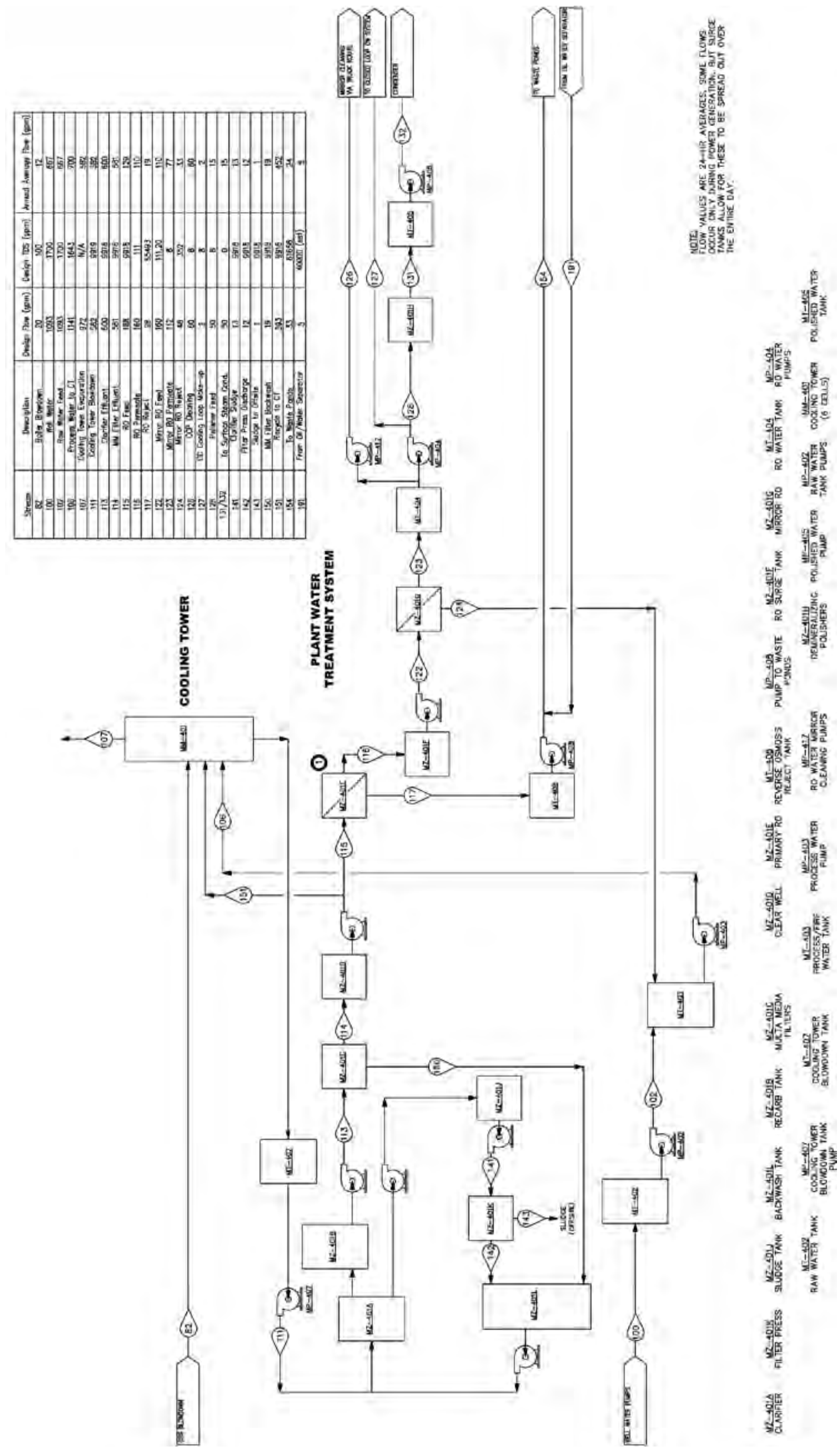


Figure 2-7: Section View Looking South



Stream	Description	Design Flow (gpm)	Design TDS (ppm)	Annual Average Flow (gpm)
82	Boiler Blowdown	20	100	12
100	Well Water	1093	1700	667
102	Raw Water Feed	1093	1700	667
106	Process Water to CT	1141	1643	700
107	Cooling Tower Evaporation	972	N/A	582
111	Cooling Tower Blowdown	582	9919	382
113	Clarifier Effluent	600	9918	600
114	MM Filter Effluent	581	9916	581
115	RO Feed	188	9915	129
116	RO Permeate	160	111	110
117	RO Reject	28	55493	19
122	Mirror RO Feed	160	111.20	110
123	Mirror RO Permeate	112	8	77
124	Mirror RO Reject	48	352	33
126	CCP Cleaning	60	8	60
127	CC Cooling Loop Make-up	3	8	2
128	Polisher Feed	50	8	15
131/132	To Surface Steam Cond.	50	0	15
141	Clarifier Sludge	13	9918	13
142	Filter Press Discharge	12	9918	12
143	Sludge to Offsite	1	9918	1
150	MM Filter Backwash	19	9919	19
151	Recycle to CT	393	9916	452
154	To Waste Ponds	33	61656	24
191	From Oil/Water Separator	5	40000 (est)	5

Figure 2-8: Water Balance Diagram

Process and cooling water needs of the AMSP would be met by use of groundwater pumped from wells on the plant site. Water for domestic use by employees would also be provided by onsite groundwater treated to potable water standards by a packaged treatment unit. Several former agricultural wells exist on the site and were used to determine water quality and for pumping tests as detailed in Section 3.7. New water supply wells would need to be installed to provide the reliability needed during plant operations. These wells would draw from the adjudicated water rights owned by Mojave Solar.

The remaining agricultural wells may be used to monitor groundwater levels and quality. Ultimately, the wells located within the solar array footprint would have their pump motors and internal components removed and reduced to near-surface grade elevations and decommissioned in accordance with applicable regulations. No offsite backup water source or supply would be included as part of the AMSP.

On the Alpha and Beta plant sites, raw water and service water storage tanks, each having a capacity of 1,930,000 gallons, would provide enough storage capacity for interruption of water supply to the facility of approximately 1 to 2 days. A portion (approximately 360,000 gallons) of the service water storage tank would be dedicated to the plants' fire protection water system (additional discussion below). Based on 2008 sampling of an existing onsite well, the raw water, circulating water, process water, and solar collector array washing water all require onsite treatment, and treatment would vary according to the quality required for each of these uses. A packaged water treatment system would be used to treat the water to meet potable standards, since the groundwater source is brackish.

Groundwater would be pumped to a raw water storage tank and a biocide (sodium hypochlorite) would be used to treat the water. When transferred to the service water tank, the water would again be treated with the biocide, if needed. This water would be used directly in the cooling tower as make-up water. To conserve water, the lower total dissolved solids (TDS) reverse osmosis reject streams would be recycled back to the service water storage tank for reuse in the cooling tower. Additionally, a clear well would be used; when the discharge exceeds the treatment system demand, the clear well discharge would be released to the cooling tower to further conserve water.

To reduce overall water consumption and sizing of evaporation ponds, service water would first be used as makeup to the cooling tower and circulating water system. The blowdown from the circulating water/cooling tower system would be continually treated by lime-softening clarification (clarifier) and filtration processes, and then delivered to a clearwell. A portion of this stream will then be further treated for various plant uses that require higher purity water, such as solar collector array cleaning and steam system makeup.

To facilitate dust and contaminant removal, partially deionized (demineralized) water would be used to clean the solar collector arrays on a periodic basis, determined by the reflectivity monitoring program and other maintenance considerations. Washing the solar collector array keeps the mirror surface, and the heat collection element and other components clean and free to operate normally. This operation is generally completed at night and involves a water truck spraying deionized water on the solar collector arrays in a drive-by fashion. The deionized water production facilities, already in place for solar steam generator makeup water, would be sized to accommodate the additional solar collector array washing demand of about 60 gallons per minute (average) for each plant site, as shown on the water balance diagrams. Water from the solar collector array washing operation is expected to evaporate on the solar collector arrays with minimal water applied to the ground. No site runoff or recharge is anticipated from this process.

The proposed fire protection systems would include a water system and portable fire extinguishers. The AMSP's fire protection water system would be supplied from a dedicated 360,000-gallon portion of the 1,930,000-gallon service water storage tanks located on each plant site. One electric and one diesel-fueled backup firewater pump, each with a capacity of 3,000 gallons per minute, would deliver water to the fire-protection water piping network on each plant site. A smaller electric-motor-driven jockey pump would maintain pressure in the piping network.

Offsite Storm Water Flow

Storm water from watershed tributaries currently enters the AMSP site in the form of sheet flow along the southern and eastern site boundaries. Storm sheet flow would be intercepted as it enters the site, conveyed around the AMSP boundary, and returned to its historical flow location and parameters as it flows into Harper Dry Lake. Earth-lined drainage channels would be constructed to intercept the flows entering the site boundary. These channels would be sized and designed to convey the calculated storm water runoff from a 100-year storm event following County of San Bernardino Flood Control District standards. Channel design and construction would incorporate measures to mitigate slope erosion, provide free-board allowances, and provide access for channel maintenance. Calculations of the offsite storm water flows and channel design parameters are included in the Project Hydrology Report included in Appendix E.

Site Drainage and Storm Water Management

The proposed AMSP site is located in the arid Mojave Desert (average annual rainfall in the site vicinity is reported as less than 7 inches) and is primarily fallow agricultural land. The existing topographic conditions of the AMSP site have an average slope of 1%. The property's existing condition creates sheet drainage/runoff during infrequent large precipitation events. Grading, drainage, and hydrology studies have been conducted. Refer to Appendix E.

Water in the solar field area would be allowed to settle in the solar fields and percolate. To facilitate this, bermed areas would be used around the solar field tiers. Site runoff is not anticipated from the solar field.

The power islands would drain away from equipment foundations. Local area containments would be provided around certain locations, such as oil-filled transformers and chemical storage areas. The water from these areas and from other plant drains would be sent to an onsite oil/water separator, which is designed to remove free floating oil, grease, and settleable oily coated solids from oil/water discharges associated with plant processes. The oil-free water would then be discharged into the evaporation ponds.

As described in the preliminary draft Drainage, Erosion, and Sediment Control Plan provided in Appendix E, a comprehensive system of management controls, including site-specific best management practices (BMPs), would be used to minimize storm water contact with contaminants and thus minimize pollutants in storm water.

Site Grading and Earthwork

Existing site elevations range from approximately 2,025 to 2,105 feet above mean sea level (amsl). Mass grading of the site would occur at the beginning of the AMSP construction period. The grading would result in a range of slopes similar to the existing slopes on the site. The preliminary site grading plan would be designed to be balanced; no import or export of soil is expected for general earthwork. Earthwork associated with the AMSP would include excavation for foundations and underground systems.

The AMSP's power islands and solar field areas would be graded to allow for a balanced distribution of material, so there would be no requirement to truck large quantities of earth materials to or from the site. The preliminary grading plan assumes appropriate soil shrinkage to achieve the balance of cut and fill material. Adjustments would be made to provide engineered fill, as required, for stabilization under equipment and structure foundations.

Roadway and Drainage Channel Crossing Improvements

Access to the AMSP would be from Harper Lake Road and Lockhart Road. Road widths and pavement types would be designed and constructed to satisfy the requirements of the County of San Bernardino Transportation Department and the San Bernardino County Fire Marshall. All-weather, paved access would be provided to both power islands for emergency and fire access. Drainage channel crossings on Harper Lake Road and Lockhart Road would be constructed to convey the 100-year storm runoff flows beneath the roadway to maintain 24-hour access to the power islands. Access to the solar fields would be provided via fair-weather crossings along the channel bottoms. These crossings would provide vehicular access during fair weather while allowing drainage flows to cross the roadways during periods of storm runoff.

2.1.1.2 Construction

The construction workforce would consist of laborers, craftsmen, supervisory personnel, support personnel, and construction management personnel. Refer to Section 3.10 and

Appendix O, which provide a breakdown of the construction workforce by skill over the entire construction period. Employment peak would involve 1,162 workers, and average construction employment levels would be 830 individuals.

AMSP preconstruction activities are anticipated to commence in spring 2011, with construction lasting up to 31 months.

Logistics

Temporary construction laydown and parking areas would be logically located on the AMSP site consistent with the material stored. An area in the northeast portion of the Alpha solar field, as shown in Figure 2-2, would be used to assemble the solar collector arrays in buildings. The construction sequence for power plant construction includes the following general steps:

- *Site Preparation:* This includes detailed construction surveys, mobilization of construction staff, demolition of the small number of existing onsite structures, grading, and preparation of drainage features. Grading for the solar field and power island would be completed during the first 6 months of the construction schedule. Finish grading and repairs would occur during the remaining construction period as portions of the AMSP are completed.
- *Foundations:* This includes excavations for large equipment (steam turbine generator, solar steam generator, generator step-up, cooling tower, etc.), footings for the solar field, and ancillary foundations in the power island.
- *Major Equipment Installation:* Once the foundations are complete, the larger equipment would be installed. The solar field components would be assembled in the onsite solar collector array assembly buildings and installed on their foundations.
- *Balance of Plant:* With the major equipment in place, the remaining fieldwork would be piping, electrical, and smaller component installations.
- *Testing and Commissioning:* Testing of subsystems would be performed as they are completed. Major equipment would be tested once all supporting subsystems are installed and tested.

Equipment and materials would be delivered to the plant site by truck; large components (e.g., steam turbine generator) and bulk deliveries would be received in Barstow by rail, transferred to truck, and then delivered to the site. To minimize impacts due to traffic, ASI is offering to provide a shuttle service from a park-and-ride, which would be located in nearby Adelanto. This would substantially reduce the number of vehicles required to travel on Harper Lake Road and alleviate any congestion at Harper Lake Road and State Route 58 (SR-58).

Construction materials would be received by rail at the Barstow Burlington Northern Santa Fe Rail Facility. This facility currently exists and has sufficient capacity to receive and provide logistic support for the proposed Project. Details of traffic from this facility and associated traffic analyses are included in Section 3.13.

2.1.1.3 Operations

The AMSP would have a moderate workforce during operation; an estimated total workforce of 63 full-time-equivalent personnel would be needed to staff the facility 24 hours per day, 7 days per week and 10 seasonal employees would be needed during the peak operating months. When the facility is not operating (i.e., not generating electricity), personnel would be present, as necessary, for maintenance, to prepare each plant site for startup, and/or for site security.

The operations workforce would include management, supervisors, plant operators, engineering and maintenance staff, skilled labor, and unskilled labor. Details of the operations employment are included in Section 3.10. The AMSP's operational traffic is detailed in 3.13 and includes employee and truck traffic for shipments.

Lockhart Substation and Interconnection

The proposed Lockhart Substation site and the interconnection to the adjacent 220-kV transmission line are located within the boundary of the AMSP site, with the interconnection linking the substation to an adjacent, existing SCE electric power line. The key elements of the substation and interconnect are summarized below:

- *Lockhart Substation*: A new 220-kV substation would loop into the existing No. 1 Coolwater–Kramer 220-kV transmission line and provide two 220-kV line positions to terminate two new 220-kV gen-ties owned by Mojave Solar.
- *Transmission Lines*: The proposed Project includes the construction of approximately 3,000 feet of new transmission line segments (composed of two line segments of approximately 1,500 feet each) connecting the Lockhart Substation to SCE's existing 220-kV transmission line. These two new lines would result in new segments of Lockhart–Kramer and Coolwater–Lockhart 220-kV transmission lines on private land or on public lands within BLM utility corridors.
- *Generation Tie Line Connections*: The proposed Project includes the connection between two gen-ties associated with the AMSP and the proposed Lockhart Substation. This work involves construction of two single spans of conductors between the Lockhart switchrack and AMSP-owned towers.
- *Distribution Line for Station Light and Power*: The proposed Project includes a connection between an existing Hutt 12-kV distribution circuit and the existing Hutt Poletop Substation by replacing an existing pole and removing an existing pole located approximately 40 feet north of the proposed Lockhart Substation within the boundary of the AMSP. In addition, approximately 200 to 400 feet of underground conduit would

be installed from the replaced pole to the Lockhart Substation to provide a path for one of the two required sources of station light and power.

Detailed descriptions are provided below for these various project elements, with additional information provided in Appendix F, *Project Description for SCE's Facilities Related to the Abengoa Solar Inc. Mojave Solar Project Interconnection*, prepared by SCE, April 21, 2010. The detailed construction assumptions in Appendix F are referred to for purposes of this analysis. Subsequent to the April 21 Project Description, additional project footprint information was provided by SCE for the fiber-optic lines, as noted further below in Section 2.1.2.

The proposed Lockhart Substation would be a 220-kV switching station measuring approximately 450 by 550 feet and considered to be an "unattended" collector station (no power transformation). The station itself would be located within the boundary of the AMSP but surrounded by a wall or chain-link fence with two gates. The substation would be constructed with a six-bay 220-kV switchrack; one bay would be used to loop the SCE No. 1 Coolwater to Kramer 220-kV transmission line, and two bays would be used to terminate the two AMSP gen-ties. The three remaining bays would be available for future use. The Lockhart Substation would be initially equipped with two overhead 220-kV buses, seven 220-kV circuit breakers, 220-kV disconnect switches, one mechanical electrical equipment room station, and light and power. To accommodate the proposed Lockhart Substation within the AMSP property and to allow for future access to the substation, a transmission ROW corridor would also be provided to SCE along the southern boundary of the AMSP, north of the existing SCE Coolwater–Kramer No. 1 and No. 2 220-kV corridor. Refer to Figure 2-1 for the location of the substation within the AMSP boundary and Figure 2-9 for substation details.

The proposed Lockhart Substation would be connected to the No. 1 Coolwater–Kramer 220-kV transmission line via loop-in transmission segments. The two loop-in line segments would create two new separate transmission lines: the Coolwater–Lockhart 220-kV transmission line and the Kramer–Lockhart 220-kV transmission line. Each transmission line segment into the Lockhart Substation would be approximately 1,500 feet long. The proposed loop-in of the existing No. 1 Coolwater–Kramer 220-kV transmission line would require approximately four double-circuit lattice steel towers to enter the Lockhart Substation. Two of the 220-kV double-circuit structures would be placed just outside of the substation fence or wall but within the AMSP boundary. The other two structures would be used to reroute the No. 1 Coolwater–Kramer 220-kV transmission line into the Lockhart Substation. The section of line connecting the existing No. 1 Coolwater–Kramer 220-kV transmission line to the first structure outside of Lockhart Substation may require a new ROW between SCE's existing ROW and the new Lockhart Substation facilities. The exact location of new and replaced towers would be determined during detailed engineering. Refer to Figures 4-1 and 4-2 in Appendix F for lattice steel and tubular steel pole renderings.

The proposed Lockhart Substation design would also involve bringing two 220-kV gen-tie segments into two new 220-kV positions. It is anticipated that there would be one Mojave

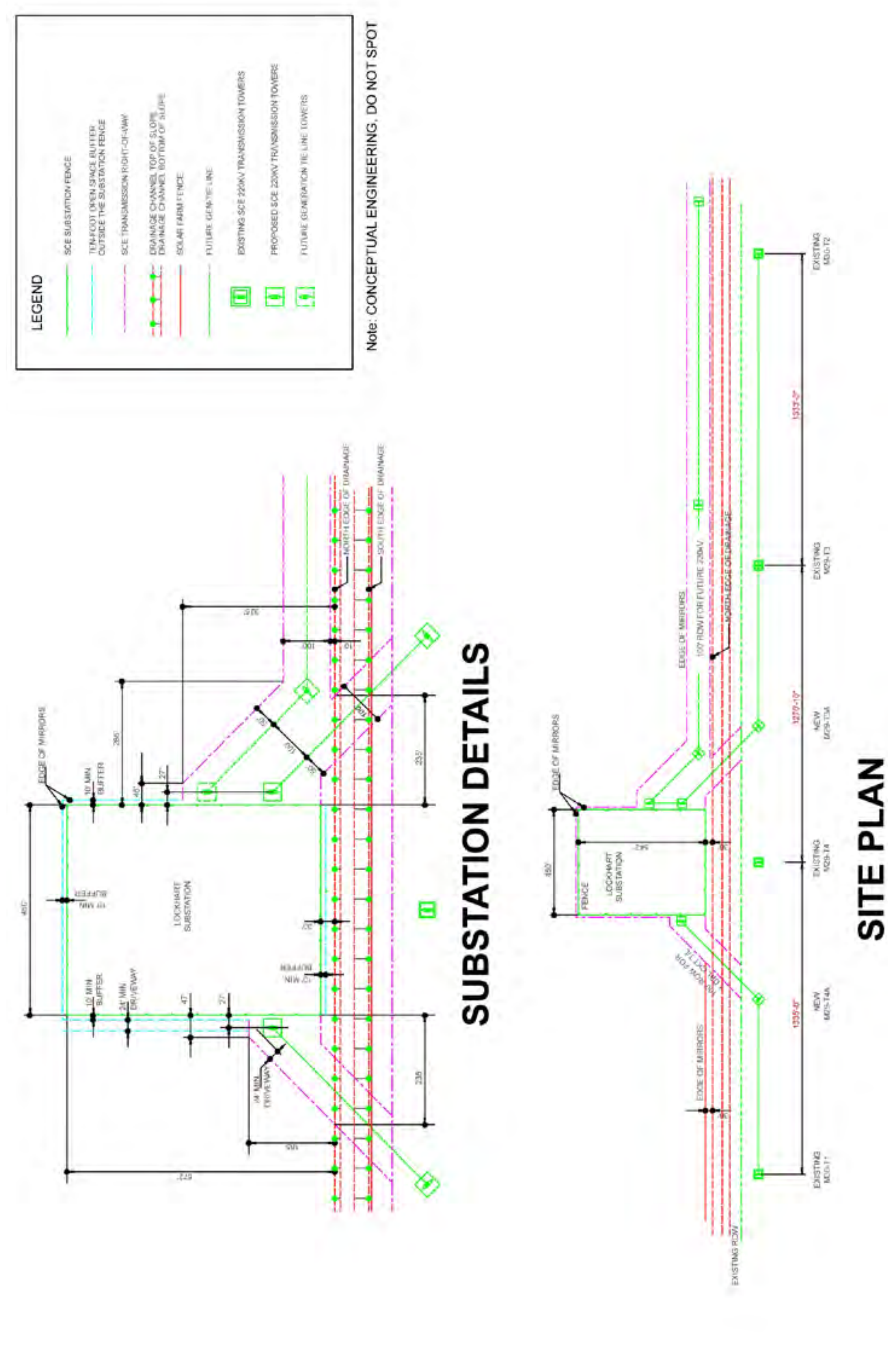


Figure 2-9: Lockhart Substation Details

Solar-owned double-circuit structure outside the Lockhart Substation to support connection of the two AMSP gen-ties. The proposed Project would require a connection between the gen-ties from the AMSP dead-end structures to the appropriate 220-kV position inside the Lockhart Substation. The span needed for this connection is estimated to be up to 300 feet, depending on the location of the transmission line tower relative to the Lockhart Substation. Refer to Figure 2-9 for substation details, including the location of gen-ties.

The proposed Project site is located adjacent to a major electric transmission corridor. The adjacent corridor includes the Coolwater–Kramer No. 1 and No. 2 220-kV transmission lines owned and operated by SCE, and the Mead–Adelanto 500-kV transmission line operated by the Los Angeles Department of Water and Power. A lower voltage transmission line (33 kV), owned by SCE, is located between the two. The transmission corridor's northern boundary is adjacent to the AMSP's southern boundary.

The project proposes interconnection to the No. 1 Coolwater–Kramer line. The AMSP is located approximately 32 transmission-miles west of the Coolwater generating facility, and approximately 13 transmission-miles east of the Kramer interconnection substation. The proposed interconnection is the basis for and described within the CAISO Interconnection Request. SCE performed a sensitivity study to evaluate if the AMSP could interconnect before implementing any transmission facility upgrades. The study indicated that a substation would be required (discussed previously), in addition to installation of appropriate fully redundant and diverse telecommunication facilities to provide overall system protection. Refer to Section 2.1.2 for the description of these facilities.

Figure 2-10 illustrates the conceptual design of a typical pole that would be used on the Mojave Solar portion of the generation tie-line (gen-tie line). The SCE portion of the gen-tie line would require installation of a tower versus a pole. Refer to the detailed description further below of the gen-tie line, which is part of the interconnection description. These pole designs were engineered to provide conceptual design limits for purposes of the electric and magnetic field (EMF) studies, as detailed in Section 3.12.3. Final design will be based on actual field conditions and site requirements.

The entire length of the transmission gen-tie line is located on the AMSP/Lockhart Substation site and would be installed on approximately 30 new steel/concrete mono-poles from the Alpha plant site and approximately nine poles from the Beta plant site. The poles are expected to average approximately 80 feet in height (maximum pole height of 110 feet), with a span length expected to average approximately 500 feet. Access by vehicle to the transmission line route would be from maintenance roads within the AMSP boundary.

230kV Single Circuit Steel Poles
80 ft. above ground + 10' Embedment
750 MCM ACSR on 650' spans

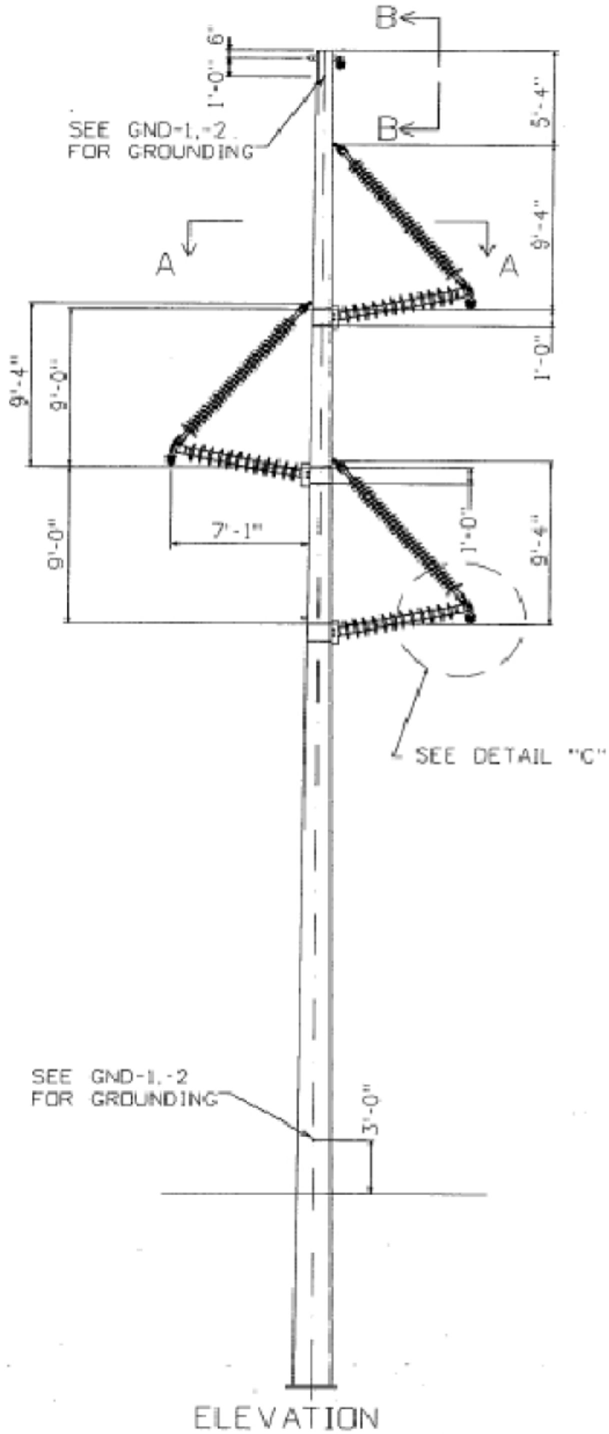


Figure 2-10: Typical Pole (Onsite)

Construction and Operations

The Lockhart Substation would be located within the boundaries of the AMSP, and grading for the substation site would be included within the plant's overall grading design. Construction assumptions for the substation, including materials and construction vehicles and personnel, are included in Tables 1 and 2 of Appendix F.

Access to the substation site for both construction and operation would be gained through the AMSP internal road network from its main access on Harper Lake Road. A temporary staging yard, estimated to be approximately 0.5 to 1.5 acres, would be provided within the AMSP site for the substation and interconnection construction. Refer to Appendix F, Section 4.2.2, for information relative to what materials and equipment would be stored in the staging area.

Construction methodology for the new 220-kV transmission structures, removal of an existing 220-kV transmission structure, and stringing the 220-kV conductor are described in detail in Sections 4.2.4 through 4.2.6 and Tables 3 through 6 of Appendix F. Construction of these facilities would take place within the boundaries of the existing AMSP or within the existing SCE 220-kV transmission line ROW.

It should be noted that construction of the new structures may require a temporary concrete batch plant within the boundaries of the AMSP for purposes of footings. Existing public roads and existing transmission line roads would be used as much as possible during construction of the substation and interconnect. Construction assumptions for the proposed light and power distribution system are found in Table 7 of Appendix F. The construction staging area for substation and interconnect would be located within the limits of the AMSP.

Transmission line construction would include the use of power poles, augmented by additional poles as necessary. The new Lockhart interconnection station would be constructed according to the following sequence of activities:

- *Pole Erection:* Each pole would be assembled onsite, welded together, and dressed out with insulators and conductor hardware.
- *Conductors:* The conductors would be installed, sagged, and permanently connected to the insulators.
- *Communication System:* The overhead ground/fiber-optic communications cable would be installed and connected to the interconnection substation.

Revenue metering would occur at the Lockhart Substation, and communications for revenue metering would be included with system upgrades. The AMSP would be able to deliver power during operational times and receive power for auxiliaries at times of no operation.

Other elements of the proposed interconnect being considered during final design are included in the AMSP/Lockhart Substation, interconnect, and existing transmission line footprints and are therefore considered in the environmental impacts in Chapter 3. Those modifications may include (1) possible relocation of an existing 12-kV transmission line within the AMSP site boundary; (2) a temporary power source within the AMSP site boundary; and (3) proper GO-95 clearances that may be need to be maintained for the 220-kV gen-tie line where it crosses Lockhart Road and SCE's existing Hutt 12-kV distribution circuit.

The proposed telecommunication facilities described below in Section 2.1.2 would require that a fiber-optic cable be installed between the Lockhart Substation and the AMSP's Alpha and Beta power plants. This cable would be constructed within the limits of the AMSP site. The proposed Project would also include new fiber-optic multiplex equipment and channel equipment within the Lockhart Substation mechanical electrical equipment room.

2.1.2 Telecommunication System

To accommodate this proposed Project and other projects in the interconnection queue, SCE has proposed significant systemwide upgrades to the transmission system in this region. Permitting of offsite upgrades is being coordinated with SCE, including communication facilities to ensure SCE-owned utilities are developed consistent with Proposed project timing.

The proposed fiber-optic system includes SCE installation of new fiber-optic communication cables between the Lockhart Substation and the Tortilla, Kramer, and Victor substations by means of stringing cable on existing transmission line poles and on seven replacement poles, constructing new interset poles, placing segments of cable in existing underground conduit, and placing cable in new underground conduit. Approximately 85 miles of fiber-optic cable is proposed for these three routes. The fiber-optic cables provide diverse path routing of communications required for the AMSP interconnection and provide communications redundancy at the two AMSP power blocks. Additional associated communications equipment is proposed within the various substations, as noted further below in Section 2.1.2.1.

2.1.2.1 Description

Lockhart to Tortilla Substation Fiber-optic Line

The proposed Project includes approximately 31 miles of new fiber-optic cable to be installed between the proposed Lockhart Substation and the existing Tortilla Substation, located to the southeast in Barstow. Approximately 1,000 feet of cable would be installed in an underground conduit within the limits of the Lockhart Substation/AMSP, transitioning to existing overhead poles near the edge of the SCE transmission corridor to the south.

The new fiber-optic cable would be strung on existing transmission poles between the Lockhart Substation and Harper Lake Road (Figure 2-11). At the intersection with Harper Lake Road, the

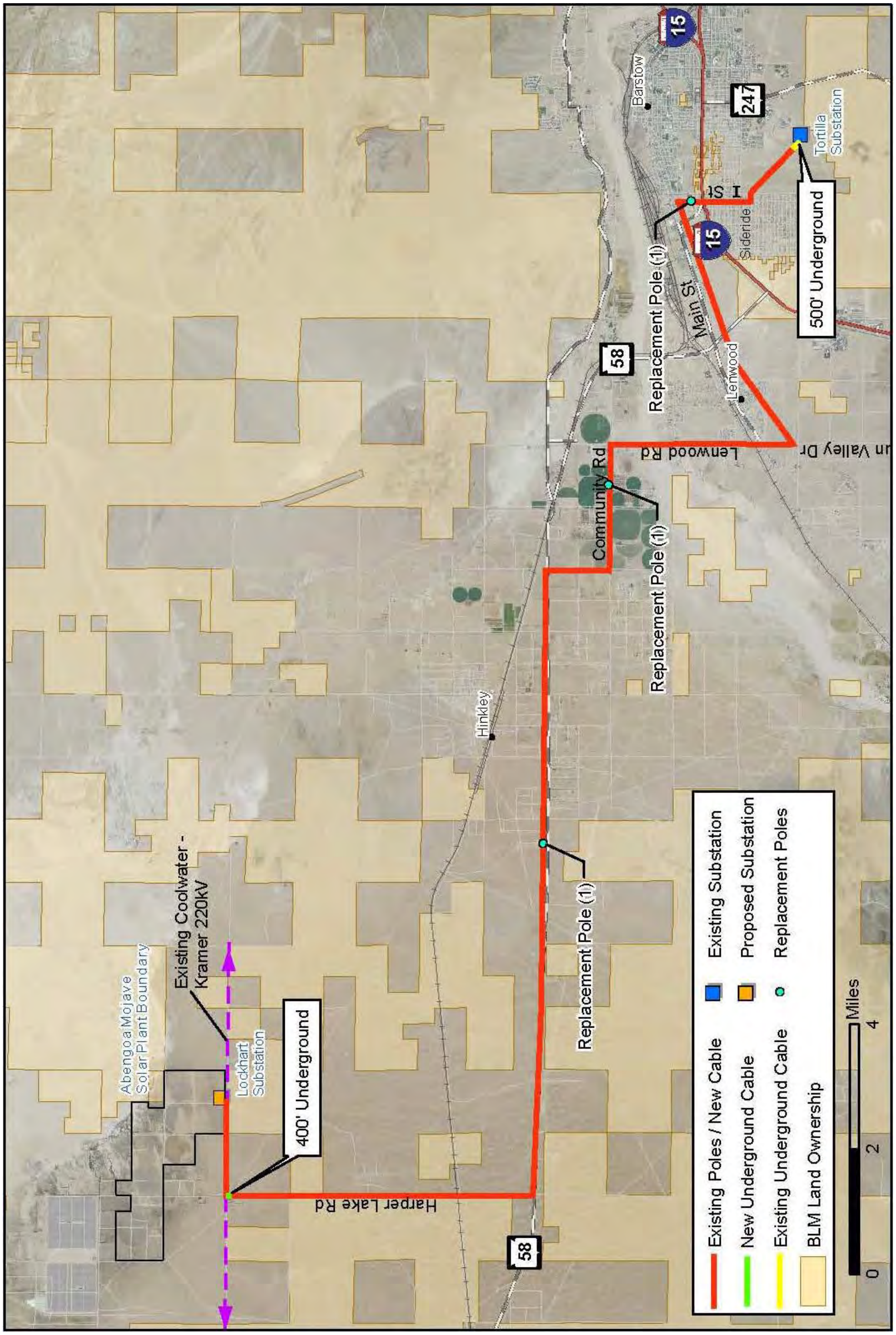


Figure 2-11: Fiber-Optic Line – Lockhart to Tortilla Substation

overhead line would transition to a new underground conduit for approximately 400 feet south, on the east side of Harper Lake Road. The new underground trench would be located within a disturbed road right-of-way on the east side of the road, before transitioning to the west side of the road. Refer to Figure 2-11 for the location of the underground conduit. From this point, the underground cable would transition back to the overhead line via a riser to existing overhead transmission line poles that parallel Harper Lake Road for approximately 5 miles south.

This method—stringing the cable on existing transmission line structures—would continue south to the intersection of Harper Lake Road/SR-58 and then continue east along SR-58, south on Summerset Road, east on Community Road, and south on Lenwood and Sun Valley roads until intersecting with an existing 33-kV transmission line (called the Poco 33-kV line) located approximately one-third mile south of Main Street. Two existing transmission poles would need to be replaced along this stretch of the corridor (refer to Figure 2-11 for the location of these poles). SCE conducted a “wind load” analysis of the existing poles to determine if any would need replacement to accommodate the addition of the new fiber-optic cable. A total of three replacement poles are required for the Lockhart to Tortilla fiber-optic line, and a total of four replacement poles are required for the Lockhart to Kramer line, as discussed further below. The cable would be strung on the existing Poco 33-kV line for approximately 4.7 miles, then would continue to be strung on existing transmission line structures south on I Street. One additional existing transmission pole would need to be replaced along I Street, as shown in Figure 2-11. Where the overhead line intersects Siderite Road, the cable would be strung on existing transmission line structures heading east along Siderite Road until intersecting with the existing SCE Kramer–Tortilla 33-kV transmission line. The fiber-optic cable would require a new telecommunication room within the Tortilla Substation and new fiber-optic multiplex equipment and channel equipment. Refer to Figure 2-11 for the location of existing poles, replacement poles, and underground conduit for the fiber-optic cable.

As shown in Figure 2-11, approximately 3.62 miles of the 31-mile Lockhart to Tortilla fiber-optic line follows existing transmission line corridors and ROWs that cross BLM lands. Implementation of the proposed fiber-optic line will require SCE to obtain a new ROW grant from BLM for approximately 5,280 feet of proposed fiber-optic cable from the AMSP/Lockhart Substation property west, following along an existing 115-kV transmission line corridor, as well as another new ROW grant for approximately 19,000 feet of proposed fiber-optic cable between the proposed Lockhart Substation and the Hinkley Substation. In addition, an existing ROW grant would need to be amended for approximately 400 feet between the Lockhart Substation and the Tortillas Substation.

Lockhart to Kramer Fiber-optic Line

Fiber-optic cable between the Lockhart Substation and Kramer Substation commences with trenching within the Lockhart Substation site to install the cable in an underground conduit approximately 1,000 feet long until it reaches the overhead poles proposed to be constructed within the AMSP property between the substation and Lockhart Road to the north (Figure 2-12).

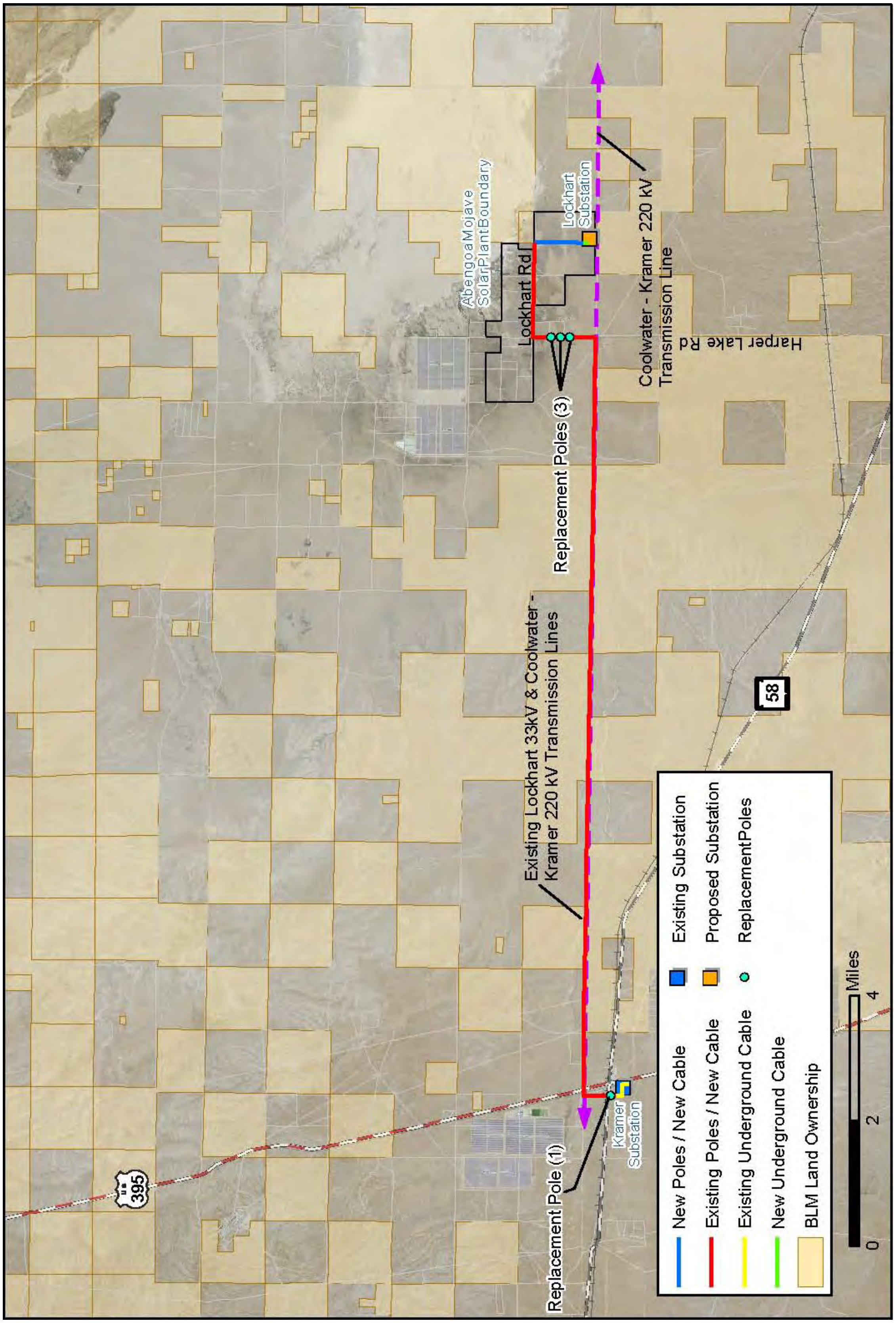


Figure 2-12: Fiber-Optic Line – Lockhart to Kramer Substation

From Lockhart Road, the fiber-optic cable would be strung on existing overhead powerline structures for a distance of approximately 1.5 miles in a westerly direction until the intersection with Harper Lake Road. The cable would continue to be strung on existing overhead transmission line structures heading south along the west side of Harper Lake Road until it intersects with the existing SCE transmission line ROW for the Lockhart 33-kV and Coolwater–Kramer No. 1 and No. 2 220-kV transmission lines. Three replacement poles would be required along Harper Lake Road, as shown in Figure 2-12. From this point, the cable would be strung on existing overhead structures within the existing ROW until just east of U.S. Highway 395. The cable would continue to be strung on existing overhead structures for another one-third mile south until the line intersects with the existing Kramer Substation. One additional replacement pole would be required adjacent to the Kramer Substation, as shown in Figure 2-12. The overhead cable would transition to an underground conduit via a riser for approximately 2,000 feet until the conduit reaches the mechanical electrical equipment room within the Kramer Substation.

New fiber-optic multiplex equipment and channel equipment would be required at the Kramer Substation. Installation of cable in existing conduit within the Kramer Substation would not require new trenching and activities would occur within the substation boundary.

As shown in Figure 2-12, approximately 7 miles of the 16.39-mile Lockhart to Kramer fiber-optic route crosses BLM lands within an existing transmission line corridor. The proposed fiber-optic line would require SCE to obtain an amended ROW grant from BLM for approximately 38,000 linear feet of this route.

Kramer to Victor Substation Fiber-optic Line

Fiber-optic cable connecting the Kramer Substation to Victor Substation would commence at the mechanical electrical equipment room within the Kramer Substation by installing cable in both a new underground conduit and existing underground conduit until it reaches the southern border of the station where it would transition to new overhead cable poles.

The proposed fiber-optic cable would be strung on the existing Kramer–Victor 115-kV transmission line for a majority of this alignment. There are three areas where the cable would need to be installed underground where the 115-kV line crosses other transmission lines. Refer to Figure 2-13 for the locations of proposed trenching. One trench would be located just north of the Victor Substation, where the cable would be installed in an underground trench underneath SR-18 and stretch 225 feet. Two other areas are farther north near U.S. Highway 395 and consist of 500 linear feet each. Trenching would also be located within the Roadway and Kramer substation boundaries, within the disturbed footprint of those existing facilities.

New poles would be required in two main areas along this alignment. Approximately 30 new poles would need to be installed within the two areas identified in Figure 2-13. The exact location of the new poles will be determined during final engineering by SCE and will be based on ground clearance and length of existing spans.

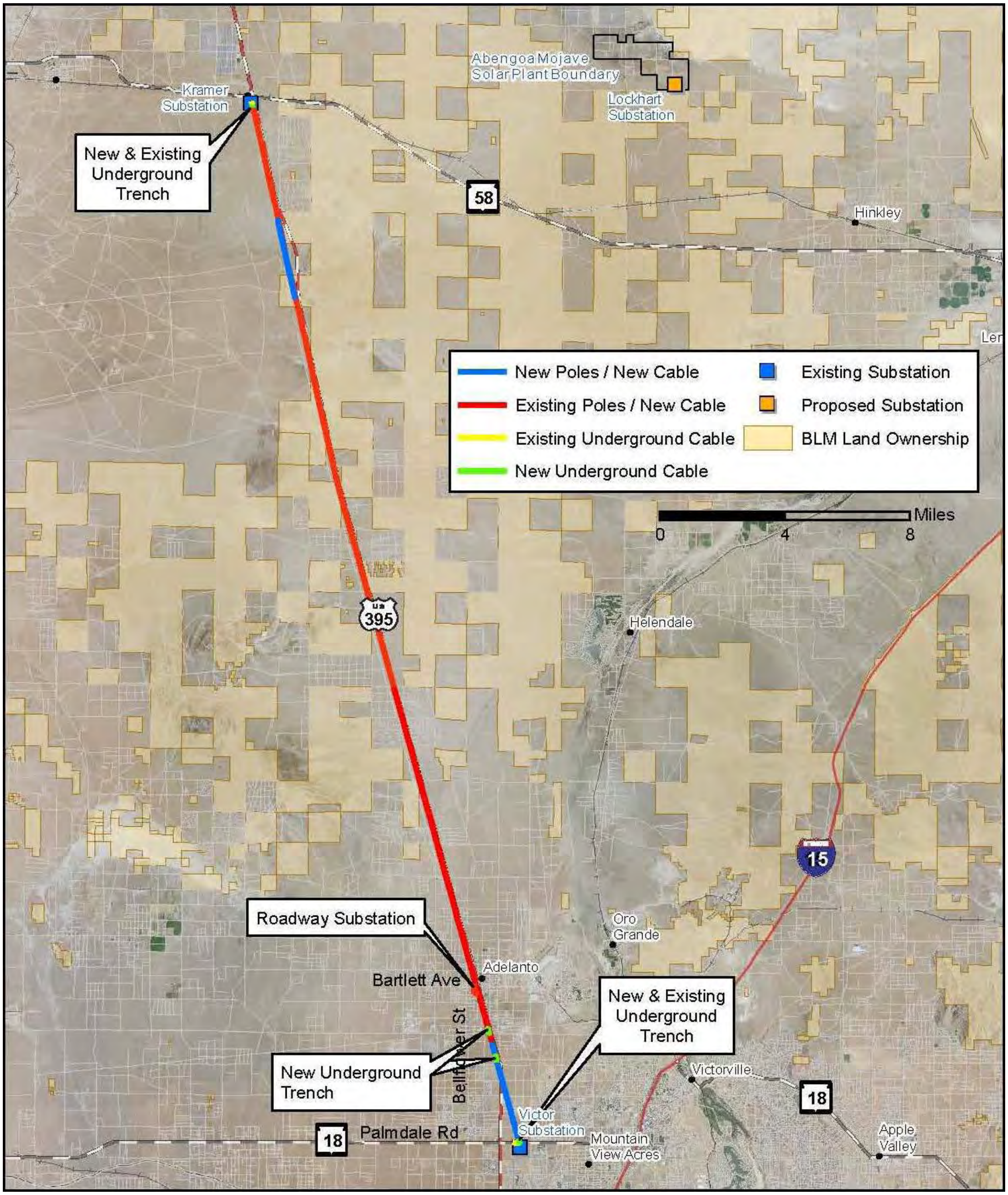


Figure 2-13: Fiber-Optic Line – Kramer to Victor Substation

As shown in Figure 2-13, approximately 8.5 miles of the 37.98-mile Kramer to Victor fiber-optic route crosses BLM lands. The proposed telecommunication system would require that SCE obtain an amended ROW grant from BLM for approximately 47,000 linear feet of this corridor. For purposes of this analysis, the following assumptions are made for impacts:

- New and replacement poles would be located within existing utility ROWs.
- New poles would be between 25 and 50 feet in height and would consist of either wood or light-duty steel.
- New underground trenching would necessitate a construction footprint of 3 feet wide by 36 inches deep.
- Stringing, pulling, and splicing activities, as well as construction equipment, would occur within existing utility ROWs; worst-case footprint assumptions were made for these activities, as noted in Table 2-2.
- Existing utility access roads would be used for construction and maintenance of cables; where existing access is undetermined, a worst-case assumption was made for new access roads, as noted in Table 2-2.
- Laydown areas would occur within the existing utility ROWs.

Because final engineering is not yet completed for the fiber-optic cables, a number of assumptions were developed by SCE for both short-term construction and long-term disturbance. The footprint assumptions, summarized in Table 2-2, represent a worst-case scenario and were used in the environmental analyses in Chapter 3.

Another segment of the SCE SPS Upgrades includes a fiber-optic line between the Tortilla Substation and the existing Coolwater Substation located east of Barstow. The Tortilla-Coolwater fiber-optic line was previously identified by SCE as a necessary overall system improvement but not specific to any individual project and is being permitted separately from the process associated with the proposed Project. Like portions of the fiber-optic routes discussed above, it is anticipated that BLM would issue a SF-299 ROW grant for that alignment as well. Environmental analysis of the Tortilla-Coolwater route is not included in this EA.

2.1.2.2 Construction

SCE would use SCE's existing substations, SCE's Barstow Service Center, and the proposed Lockhart Substation as staging and laydown areas to support installation of the telecommunication facilities required for this proposed Project. SCE or contractor crews would use standard methods to construct the required fiber-optic cables. Projected labor force and construction equipment estimates for installation of the fiber-optic cables are provided in Table 9 of Appendix F.

Table 2-2: Project Footprint/Disturbance Assumptions for the Fiber-Optic Corridors

Route	Feature	Units Needed	Per Unit Impact (ft^2)	Disturbance Area Footprint (ft^2) [3]	Disturbance Area Acres
Lockhart to Tortilla	Replacement Poles due to Wind Load Estimates[1]	3	4,500	13,500	0.31
	Access Road (8 feet wide by 5 miles long) near Harper Lake Road	1	211,200	211,200	4.85
	Pulling and Splicing Sites	32	4,800	153,600	3.53
	Access Road on diagonal route to Tortilla Substation (8 feet wide by 6,100 feet long)	1	48,800	48,800	1.12
	Trenching along Harper Lake Road (3 feet wide by 400 feet long)	1	1,200	1,200	0.04
Subtotal				428,300	9.83
Lockhart to Kramer	Replacement Poles due to Wind Load Estimates[1]	4	4,500	18,000	0.41
	Pulling and Splicing Sites	13	4,800	62,400	1.44
Subtotal				80,400	1.85
Kramer to Victor	New interset poles (new poles between existing poles for stability)	30	11,250	337,500	7.75
	Installation of Fiber-Optic Cable Hardware onto Poles	201	280	56,280	1.29
	Pulling and Splicing Sites	22	4,800	105,600	2.42
	Trenching (three areas)[2]	1	3,360	3,360	0.07
Subtotal				502,740	11.53
Total				1,011,440	23.22

1 All poles are accessed from existing roads or previously disturbed areas (no new constructions zone proposed, only pole site disturbance).
2 Three areas: 3 feet wide by 225 feet, 395 feet, and 500 feet in length.
3 The disturbance footprints noted below address all fiber-optic lines outside the boundary of the AMSP/Lockhart Substation site.

The proposed fiber-optic telecommunication system would be constructed concurrently with construction of the AMSP, Lockhart Substation and interconnection. The construction would take approximately 31 months, beginning in spring 2011.

2.1.2.3 Operations and Maintenance

As noted previously, the Lockhart Substation would not require full-time employment for operations. The substation, interconnection facilities, and fiber-optic lines would require periodic maintenance, but such maintenance is expected to be fairly minimal. Operation of the Lockhart Substation would be conducted by SCE and CAISO. Communications necessary for the operation and delivery of power from the Lockhart Substation would be made as part of the systemwide improvements.

2.1.3 Translocation of Desert Tortoises

The BLM Proposed Action includes relocation and/or translocation of any desert tortoises found in the proposed plant site boundary to receptor areas that provide suitable habitat. These areas and strategies for translocation are outlined in detail in the draft Desert Tortoise Clearance and Relocation/Translocation Plan, attached to this EA in Appendix M-1.

2.2 Permits, Approvals, and Authorizations

Several permits, approvals, and authorizations would have to be completed before commencement of construction and other ground-disturbing activities for the proposed Project. Table 2-3 lists the permits, approvals, and authorizations necessary for the proposed Project, as well as the issuing federal, state, or local regulating agencies.

Table 2-3: Permits, Approvals, and Authorizations for the Project

Agency	Permit/Approval	Description
Federal		
U.S. Department of Energy	Loan Guarantee	Financing for the construction of the Proposed Action
U.S. Fish and Wildlife Service	Endangered Species Act Compliance	Protection of Listed Species, Section 7 Consultation, Biological Opinion
U.S. Army Corps of Engineers (USACE)	Nationwide Permit under Section 404 of the Clean Water Act	Required for any surface disturbance to federal jurisdictional waters. This applies only to segments of the fiber-optic telecommunication line. [1]
U.S. Bureau of Land Management	Right-of-Way Grants (5)	Three amended grants and two new grants to accommodate the proposed fiber-optic line.
U.S. Environmental Protection Agency, Region IX	Hazardous Waste Generator ID	RCRA requires individuals who operate a facility for recycling, treating, storing or disposing of hazardous waste to obtain an ID no.
U.S. Department of Transportation	Registration for shipment of hazardous materials, 49 CFR, Part 107, Subpart G	For shipment of any hazardous waste that would be transported on highways.
State Historic Preservation Officer	Concurrence with the National Historic Preservation Act	Section 106 Consultation
State		
California Energy Commission (CEC)	Application for Certification, Permit to Construct, Authority to Construct (Air Quality), 2081 (CDFG take authorization), SWPPP (discharge of storm water), Notice of Intent for construction storm water permit, and Waste Discharge Requirements.	Compliance with California Code of Regulations, Title 20 for the construction, ownership, and operation of a new solar electric-generating facility. The CEC License Decision includes other state authorizations required for the proposed Project, such as Permit to Construct, Authority to

Agency	Permit/Approval	Description
		Construct (Mojave Desert Air Quality Management District); California Fish and Game Code § 2081 incidental take authorization; California Fish and Game Code § 1600 Streambed Alteration Agreement (if required); SWPPP (discharge of storm water); NOI for construction storm water permit, and Waste Discharge Requirements. A separate application for SCE's fiber-optic communication system will be required as part of the CPUC processing; this is anticipated to be an amendment to the CEC permit.
California Public Utilities Commission (CPUC)	Permit to Construct for SCE's fiber-optic telecommunication system.	The proposed fiber-optic communications system will require further state approvals for SCE, including CEQA compliance and any state agency permits.
California Department of Fish and Game (CDFG)	A Streambed Alteration Agreement under Section 1600 et seq. of the California Fish and Game Code and 2081 take authorization.	Required for surface disturbance to state jurisdictional waters and any take of State-listed species. This is applicable to the fiber-optic telecommunication lines.
California Department of Transportation	Oversize Load Permit	Required for moving oversize loads on state highways
Local		
San Bernardino County	Well Permit Modification and Well Abandonment	Required for closing and modifying existing wells onsite.
San Bernardino County	Septic System Permit	For operations of a septic system and leach field
San Bernardino County	Potable Water System Permit	For operation of a nontransient, noncommunity water system
San Bernardino County	Fire Department. Hazardous Materials Business Plan	A written plan for handling hazardous materials

[1] USACE made a determination on February 26, 2010, that the AMSP was not subject to USACE's jurisdiction under Section 404 of the Clean Water Act, and a Section 404 permit would not be required. Refer to Appendix R for USACE correspondence.

2.3 Alternative Locations Considered but Eliminated

In 2006, Mojave Solar conducted a site selection analysis to identify the appropriate location for the AMSP in California. Mojave Solar considered the following criteria during site selection: (1) incoming solar radiation (insulation) value commensurate with a solar thermal project, (2) minimal slope, (3) proximity to transportation corridors, (4) water availability, (5) previously disturbed land, (6) proximity to the electric transmission grid, and (7) availability of the land for purchase or lease (site control). Based on these criteria, Mojave Solar determined that the Hinkley, California, area would be an ideal location for the AMSP and researched the ability to purchase a large parcel of contiguous land.

As part of the due diligence process, Mojave Solar conducted a preliminary screening of four sites, including the proposed AMSP site. The three alternative AMSP sites (Areas A, B, and C) were similar to the selected site based on environmental considerations; however, the AMSP site was the only one with optimal proportion (length of property compared to width of property) for development. In addition, the groundwater supply at the selected site was determined to be more than sufficient for the life of the AMSP. Also, because the site consists primarily of fallow agricultural lands, impacts to native habitat and sensitive desert resources would be minimized.

Areas A, B, and C were eliminated from detailed analysis because they were technically infeasible due to the lack of land available for purchase or lease (site control). The alternative locations that were considered but eliminated are described below.

- Area A: This layout included land to the west of Harper Lake Road, abutting SEGS VIII and IX on its northern border, with the western boundary approximately 2.5 miles west of Harper Lake Road and the southern boundary mostly coincident with Lockhart Ranch Road. Area A was found to be technically infeasible and was eliminated from further analysis because of a lack of site control. In addition, this site would result in similar but greater impacts compared to the AMSP site. The western half includes undisturbed land that contains desert tortoise and western burrowing owl sign identified during a survey conducted in 2008.

- Area B: This layout included land to the east of Harper Lake Road and south of Lockhart Ranch Road. Area B would span approximately 2.5 miles east to west and would abut the existing Coolwater-Kramer No. 1 and No. 2 transmission line corridors along its southern boundary. However, Area B was considered technically infeasible and was eliminated from further analysis due to a lack of site control. Environmental impacts would be similar but greater than the AMSP since the eastern half includes undisturbed land that contains desert tortoise and western burrowing owl sign identified during a survey conducted in 2008.

- Area C: This layout includes land to the north of Lockhart Ranch Road and to the east of Harper Lake Road. Area B would span approximately 2.5 miles north to south and would abut SEGS VIII and IX on the western boundary. Area C was also considered technically infeasible and was eliminated from further analysis due to a lack of site control.

Mojave Solar eliminated Areas A, B, and C from further consideration, and identified the AMSP site as the optimal location for the solar thermal plant. The AMSP site was the only site with optimal proportion (length of property compared to width of property) for development and was technically feasible in terms of availability of land for purchase or lease. In addition, the groundwater supply at this site was determined to be more than sufficient for the life of the solar plant. Also, because the site consists primarily of fallow agricultural lands, impacts to native habitat and sensitive desert resources would be minimized.

No alternative locations were identified for the proposed fiber-optic lines since the AMSP and Lockhart Substation need to connect to existing substations in the area, and existing utility corridors and poles already exist between the AMSP site and the various substations. It was determined that the optimal location for the fiber-optic lines was to use existing utility corridors. Selecting alternative corridors for stringing the telecommunication system would not meet the proposed Project's purpose and need of connecting to area substations for purpose of operational controls.

2.4 No-Action Alternative

Under the No-Action Alternative, DOE would not issue Mojave Solar a loan guarantee for the proposed Project and BLM would not grant ROWs for the fiber-optic lines necessary to support the proposed Project. Mojave Solar has determined that timelines associated with pursuing financing through commercial debt markets would be inconsistent with construction deadlines established to honor executed commercial agreements. In addition, factors associated with financing through commercial debt markets would preclude the economic viability of the proposed Project due primarily to high debt interest rates and reduced terms of borrowing. Therefore, under the No-Action Alternative, Mojave Solar would not proceed with the proposed Project. If Mojave Solar does not proceed with the proposed Project, the environmental impacts and consequences described in Chapter 3 would not occur.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

As indicated in Chapter 2, the proposed Project consists of several key elements, including the AMSP, the Lockhart Substation and interconnection to the existing transmission line system, and new fiber-optic telecommunication lines linking the site to various substations in the region. Due to the geographic difference between the solar plant site and the fiber-optic corridors that stretch in three directions from the plant site, the following environmental analyses have been organized into two subsections for each environmental topic. The subsections titled “AMSP and Lockhart Substation” address the affected environment and environmental consequences associated with the solar plant, the substation, and the interconnection facilities to the adjacent 220-kV transmission line. The subsections titled “Telecommunication System” address the three proposed fiber-optic cable corridors. In some instances, the Affected Environment discussion is applicable to the proposed Project as a whole; in that case, two subsections are not deemed necessary.

For purposes of implementing the proposed BMPs and environmental protection measures, the responsible party would be either Mojave Solar or SCE, depending upon where the adverse effect is projected and who the “project owner” is for that part of the proposed Project. Measures referenced in the following subsections are included in their entirety in Appendix S, along with the responsible party for ensuring implementation of the applicable measure.

Environmental Consequences and Significance Criteria

In accordance with Section 1508.27 of the CEQ Regulations, NEPA requires consideration of both the context and the intensity of environmental consequences. Context “means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Intensity refers to the severity of an impact and there are 10 factors to consider regarding the intensity of an environmental consequence:

1. Impacts that may be both beneficial and adverse. A significant effect may exist even if the federal agency believes that on balance the effect will be beneficial.
2. The degree to which the proposed action affects public health or safety.
3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.
5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.
8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.
9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.
10. Whether the action threatens a violation of federal, state, or local law or requirements imposed for the protection of the environment."

The following analysis takes these factors into consideration when determining whether there is a significant environmental consequence.

3.1 Land Use

3.1.1 Regulatory Framework

The proposed AMSP, Lockhart Substation, and interconnection facilities are located in an unincorporated area of San Bernardino County. The proposed telecommunication fiber-optic lines are partially within unincorporated San Bernardino County and partially within the cities of Barstow, Victorville, and Adelanto (see Figure S-1). In addition to the County and cities, the proposed Project study area passes through or adjacent to lands under the jurisdiction of Edwards Air Force Base and BLM.

Bureau of Land Management, CDCA Plan and WEMO Plan

BLM maintains land use jurisdiction over large blocks of land in the study area and surrounding area (Figure 3.1-1). Although the proposed AMSP is not located on BLM lands, to varying degrees, portions of all three of the fiber-optic routes cross public lands under the administration of BLM. In most instances, the fiber-optic cable would be located within existing SCE ROW grants for transmission lines. Modifications to three existing grants (CACA 021596, CALA 030913, and CARI 001280) are needed, as well as two new grant applications (CACA-052096 and CACA-52616). These grants would allow the installation of telecommunication systems (a Special Protection System [SPS]) to provide for monitoring and remote operations

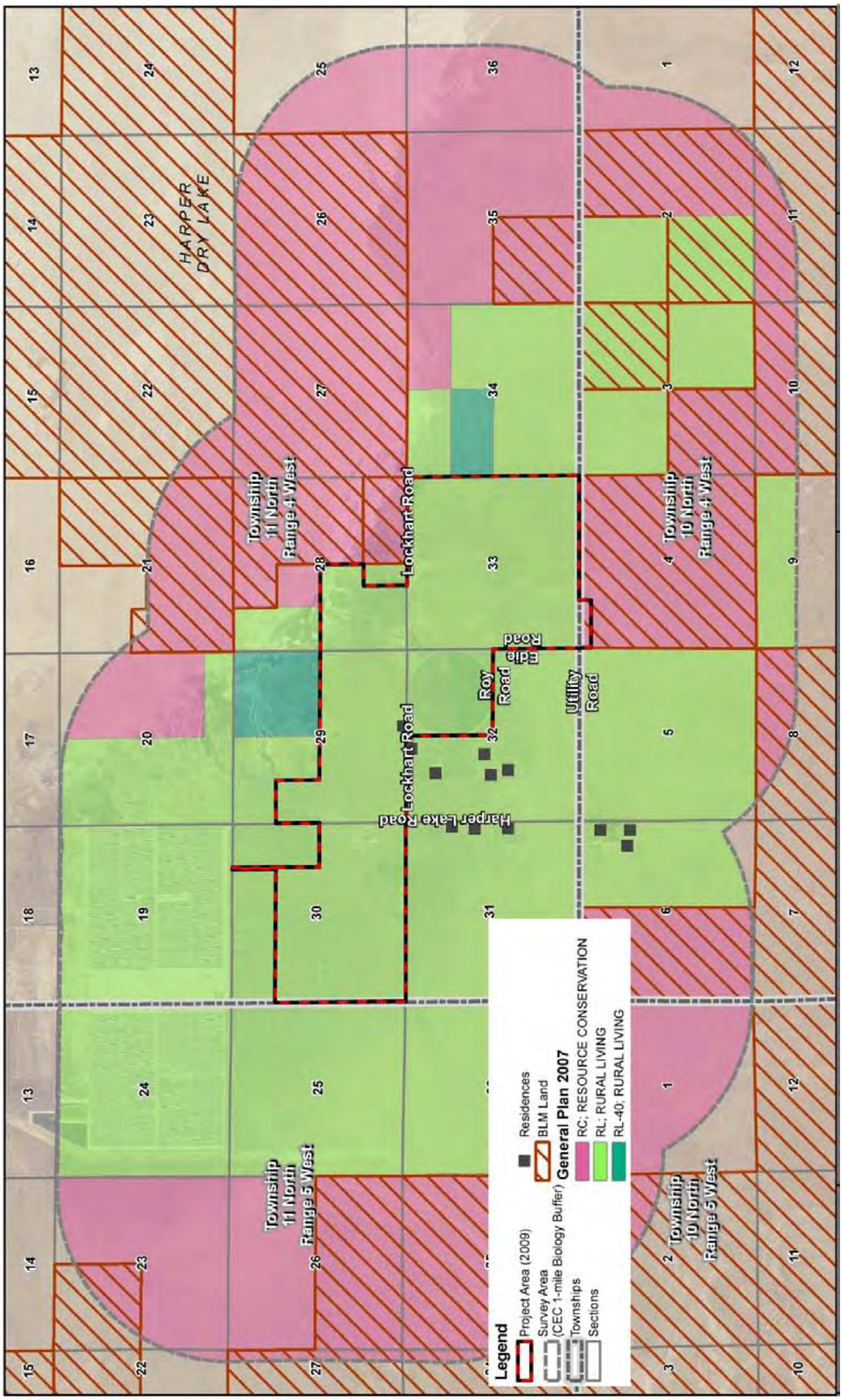


Figure 3.1-1: Land Use

capabilities of the electrical equipment at the proposed Lockhart Substation. BLM lands are managed pursuant to the California Desert Conservation Area (CDCA) Plan, approved in 1980. The CDCA Plan was designated by Congress in 1976 pursuant to the Federal Lands Policy and Management Act and covers 25 million acres of land. Management of the CDCA Plan, as with all lands managed by BLM, is based on the concept of Multiple Use. The West Mojave Plan (WEMO Plan) amended the BLM CDCA Plan for a large portion of the Mojave Desert (BLM 2006) to identify and conserve sensitive and listed biological species.

The WEMO Plan classifies BLM-managed land in the study area and surrounding areas as "L – Limited Use" (WEMO Final Plan and FEIS, 2005, map 2-2) under the multiple-use land use classification system. The "L" classification protects sensitive, natural, scenic, ecological, and cultural resource values. Public lands designated as Class L are managed to provide for generally lower intensity, carefully controlled multiple use of resources, while ensuring that sensitive values are not significantly diminished.

The CDCA Plan, as amended, designates the Harper Dry Lake as an Area of Critical Environmental Concern (ACEC). This ACEC is located approximately 0.12 mile northeast of the AMSP site in the study area. The ACEC was established to protect the remnant marshes and endemic plants in this area, as well as the migratory and resident bird species that use this area. The playa bordering the marshes has supported nesting western snowy plovers. These birds were present and probably nesting in 2003 and 2004 (BLM 2005). The WEMO Plan 2006 amendment to the CDCA Plan changed the ACEC boundaries to delete 110 acres of barren lakebed north of the existing BLM wildlife viewing area from the ACEC. The 2006 amendment added 110 acres to the southern side of the ACEC to include watchable wildlife area improvements, and added management prescriptions addressing nesting western snowy plovers and any alkali wetland plant species (WEMO Final Plan and FEIS, Vol. 2, App D).

Farmland Protection Policy Act

The federal Farmland Protection Policy Act requires federal agencies to identify and take into account the impacts of their actions on prime or unique farmland. DOE uses the National Resource Conservation Service (NRCS) Farmland Conversion Impact Rating to analyze these impacts.

Congress passed the Farmland Protection Policy Act in 1981 in response to a substantial decrease in the amount of open farmland (7 U.S.C. 4201 et seq.). The purpose of the Farmland Protection Policy Act is to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses, and to ensure that federal programs are administered in a manner that, to the extent practicable, is compatible with state and local governments, and private programs and policies to protect farmland (7 U.S.C. 4201(b)). Under the Farmland Protection Policy Act, farmland is defined as:

- *Prime Farmland:* Land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion, as determined by the Secretary of Agriculture. Prime farmland includes land that possesses the above characteristics but is being used currently to produce livestock and timber. It does not include land already in or committed to urban development or water storage (7 U.S.C. 4201(c)(1)(A)).

- *Unique Farmland*: Land other than prime farmland that is used for production of specific high-value food and fiber crops, as determined by the Secretary of Agriculture. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality or high yields of specific crops when treated and managed according to acceptable farming methods. Examples of such crops include citrus, tree nuts, olives, cranberries, fruits, and vegetables (7 U.S.C. 4201(c)(1)(B)).
- *Farmland of Statewide or Local Importance*: Farmland, other than prime or unique farmland, that is of statewide or local importance for the production of food, feed, fiber, forage, or oilseed crops, as determined by the appropriate state or local government agency or agencies, and that the Secretary of Agriculture determines should be considered as farmland (7 U.S.C. 4201(c)(1)(C)).

Under the Farmland Protection Policy Act, the Secretary of Agriculture established criteria for use by federal agencies to consider effects to farmland. As stipulated by the Farmland Protection Policy Act, federal agencies are to (1) use the criteria to identify and account for the adverse effects of their programs on the preservation of farmland, (2) consider alternative actions, as appropriate, that could lessen adverse effects, and (3) ensure that their programs, to the extent practicable, are compatible with state, units of local government, and private programs and policies to protect farmland (7 U.S.C. 658.1). Federal agencies comply with the Farmland Protection Policy Act by completing a Farmland Conversion Impact Rating Form for submittal to the NRCS.

California Public Resources Code, Warren-Alquist Act

The California Public Resources Code establishes CEC as the decision-making authority over land use decisions and environmental determinations in accordance with provisions of the Warren-Alquist State Energy Resources Conservation and Development Act (Warren-Alquist Act) codified in Section 25000 et seq. of the California Public Resources Code.

The Warren-Alquist Act further provides in California Public Resources Code Section 25519(c) that “The commission shall be the lead agency as provided in Section 21165 [of the California Environmental Quality Act] for all projects that require certification pursuant to this chapter…” California Public Resources Code Section 25523(a) also requires CEC to prepare a written decision that includes measures to protect environmental quality and public health and safety. CEC has just issued the Supplemental Staff Assessments for the AFC.

California Public Resources Code, Important Farmland

California Public Resources Code Section 21060.1 provides definitions of agricultural land as defined by the U.S. Department of Agriculture (USDA) land inventory and monitoring criteria as modified for California. Prime Farmland, Farmland of Statewide Importance, and Unique Farmland are defined as Important Farmland in Appendix G of the California Environmental Quality Act (CEQA) Guidelines.

Pursuant to Government Code Sections 65567(b) and California Public Resources Code Section 612, the California Department of Conservation (CDC) Division of Land Resource Protection operates the Farmland Mapping and Monitoring Program. The Farmland Mapping and Monitoring Program was established in 1982 by the State of California to continue the Important Farmland mapping efforts begun in 1975 by the NRCS, which aimed to produce agricultural resource maps based on soil quality and land use across the nation. CDC's system was designed to inventory, map, and monitor the acreage of California farmland to document how much agricultural land was being converted to nonagricultural land or transferred into (or out of) Williamson Act contracts, which are long-term contracts designed to keep agricultural land in production. CDC's classifications in the Important Farmland Inventory System are as follows:

- Prime Farmland—land that has the best combination of features for the production of agricultural crops;
- Farmland of Statewide Importance—land other than Prime Farmland that has a good combination of physical and chemical features for the production of agricultural crops, but that has more limitations than Prime Farmland, such as greater slopes or less ability to store soil moisture;
- Unique Farmland—land of lesser quality soils used for the production of the state's leading agricultural cash crops;
- Farmland of Local Importance—land of importance to the local agricultural economy;
- Grazing Land—existing vegetation that is suitable to grazing;
- Urban and Built-Up Land—land occupied by structures in density of at least one dwelling unit per 1.5 acres;
- Land Committed to Nonagricultural Use—vacant areas; existing land that has a permanent commitment to development but has an existing land use of agricultural or grazing lands; and
- Other Land—land that does not meet criteria of the remaining categories.

The Farmland Mapping and Monitoring Program map for the AMSP/Lockhart Substation site is included as Figures 3.1-2 and 3.1-3. The Farmland Mapping and Monitoring Program designates a portion of the AMSP/Lockhart Substation site as Prime Farmland (71 acres) and Farmland of Statewide Importance (57 acres). Prime Farmland is defined as farmland with the best combination of physical and chemical features able to sustain long-term agricultural production. Farmland of Statewide Importance is characterized as land with a good combination of physical and chemical characteristics for agricultural use, having only minor shortcomings (CDC 2009). The Farmland Mapping and Monitoring Program map depicts the abandoned town of Lockhart and other agricultural properties west of Harper Lake Road as urban and built up land.

Other CDC lands designated as Important Farmland are located in the fiber-optic area approximately 10 to 12 miles southeast of the AMSP site near Barstow. These lands are classified as Prime, Unique, and Farmland of Statewide Importance, and also include some Williamson Act lands. Most of these agricultural lands are clustered in areas to the northwest of Barstow in the Mojave River floodplain.

California Government Code

The California Government Code, referred to as the State Planning and Zoning Law, includes the provisions of California Senate Bill (SB) 1462, adopted in 2005, that requires the military to be notified of any land use proposal located within 1,000 feet of a military installation, within special use airspace, or beneath a low level flight path. To aid in the implementation of SB 1462, the California Office of Planning and Research drafted the R-2508 Joint Land Use Study to address land use issues for the R-2508 military range complex (R-2508 Complex). This 20,000-square-mile range complex encompasses large portions of Inyo, Kern, San Bernardino, and Tulare counties, and includes Edwards Air Force Base, China Lake Naval Aviation Weapons Station, and the Army’s Fort Irwin National Training Center.

The AMSP/Lockhart Substation site is located within the southern boundary of the “special use airspace” beneath a “low level flight path” (Figure 3.1-4). Projects within this region must include an evaluation of land use compatibility pursuant to Sections 65352, 65940, and 65944 of the California Government Code. This evaluation requires consultation among the project Applicant, the public agency, and the affected military branch.

County of San Bernardino

<u>San Bernardino County Code</u>

County zoning is authorized by Section 65800 of the California Government Code. The purpose of zoning is to regulate the use of buildings, structures, and land for industry, business, residences, and open space including agriculture, recreation, enjoyment of scenic beauty, use of natural resources, and other purposes.

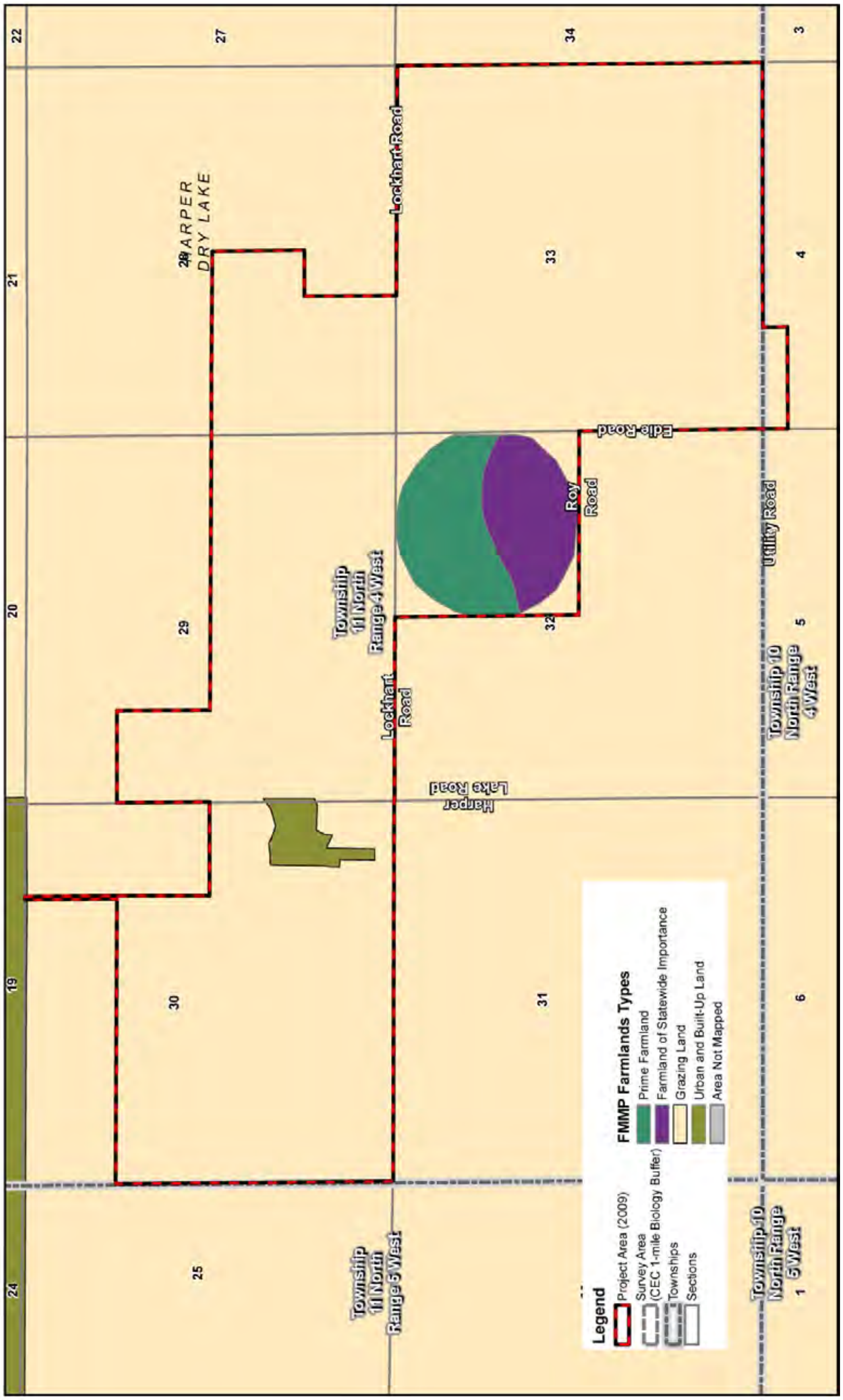


Figure 3.1-2: Agricultural Land

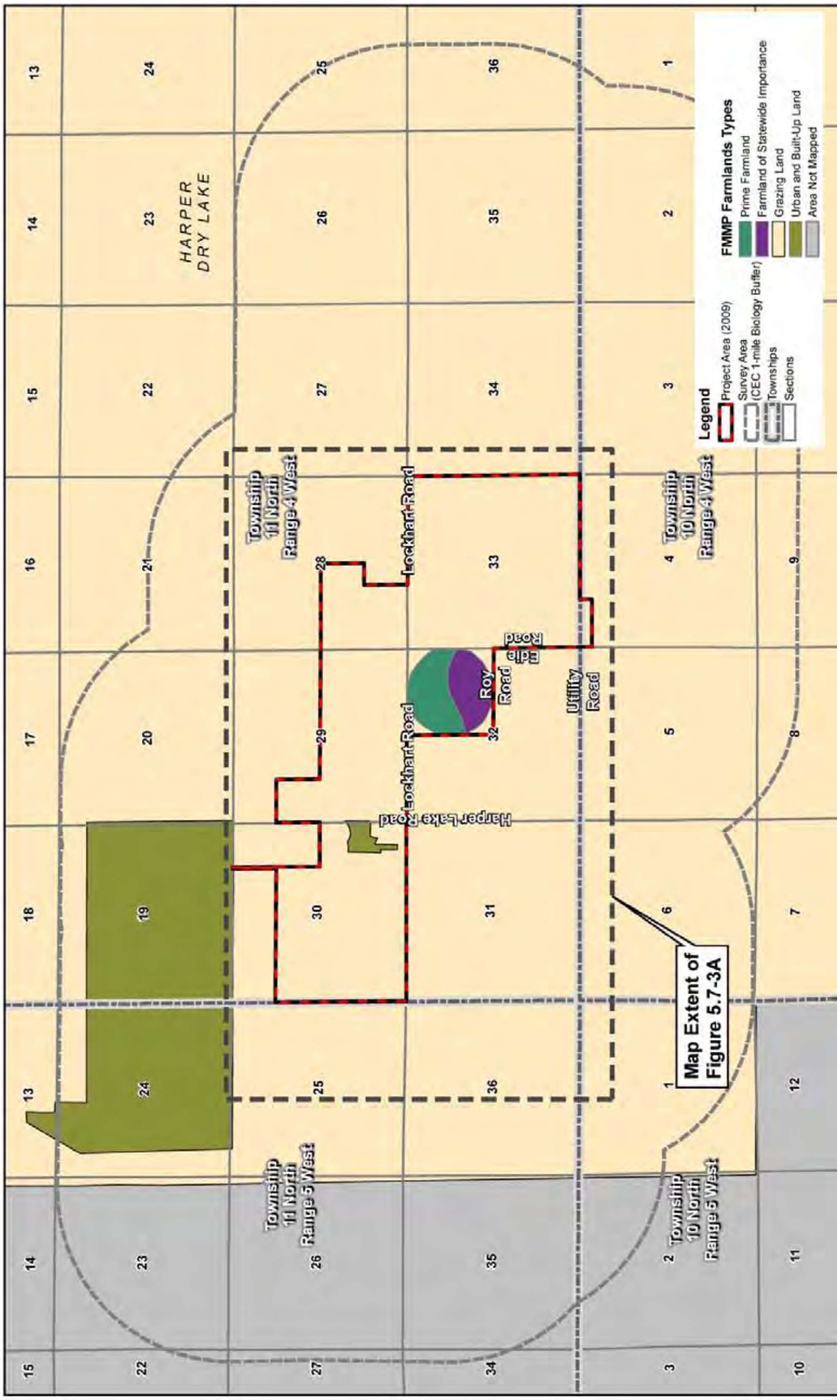


Figure 3.1-3: Agricultural Land

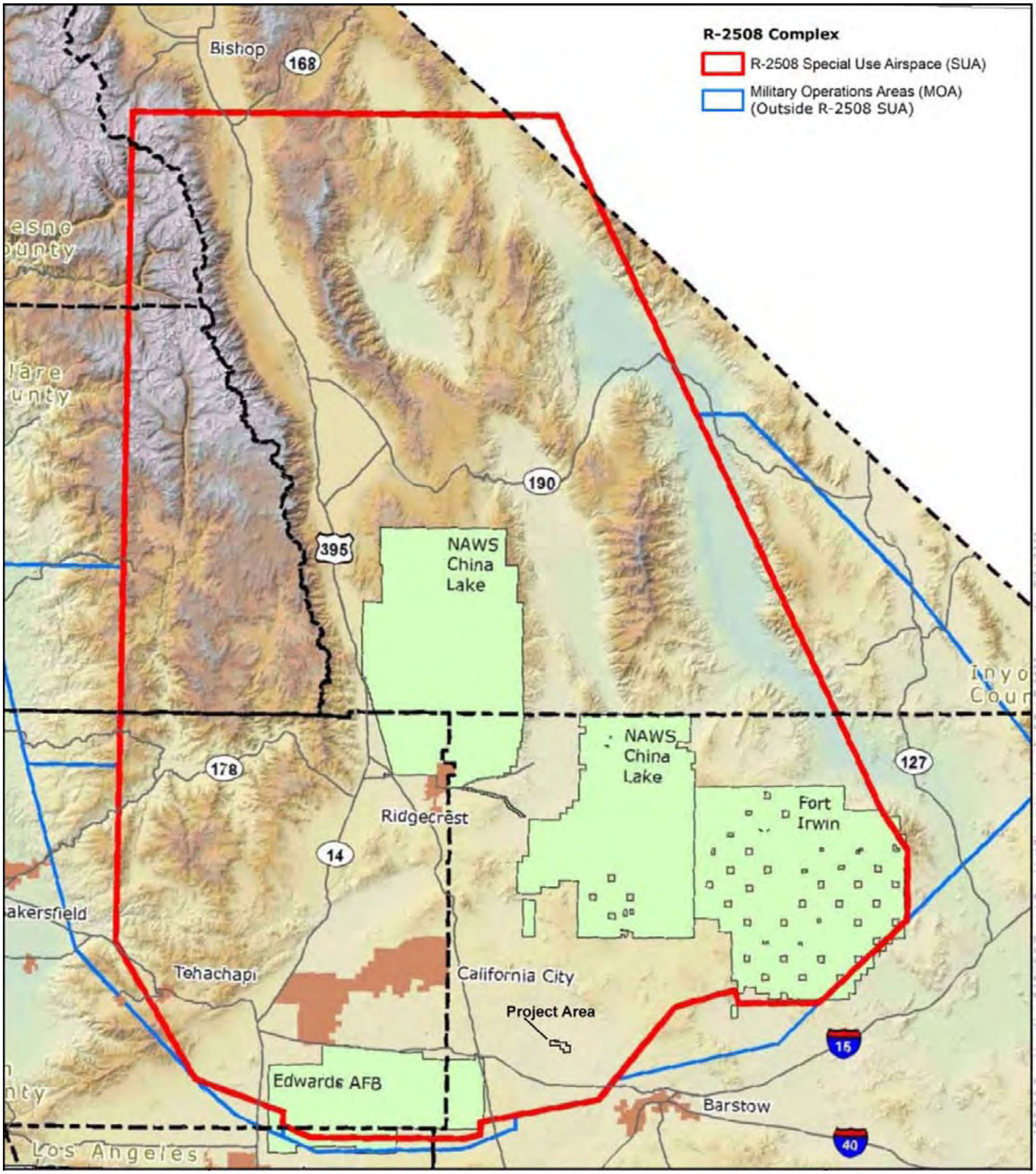


Figure 3.1-4: Joint Service Restricted R-2508 Complex

San Bernardino County General Plan and Zoning

The AMSP/Lockhart Substation site and most of the fiber-optic corridors are located within unincorporated San Bernardino County. Portions of the proposed fiber-optic line pass through the incorporated city limits of Adelanto, Victorville, and Barstow (see Figure S-1). The County has adopted a “one-map approach” for both the General Plan land use designations and zoning classifications. The one-map approach ensures land use consistency between the County’s General Plan and its zoning code. This section discusses applicable land use designations and policies described in the San Bernardino County General Plan. The County zoning information is contained in Title 8, the San Bernardino County Development Code, which was substantially updated with several amendment revisions before the Board of Supervisors in 2008 and 2009. Refer to Figure 3.1-1 and Figures 3.1-5, 3.1-6, and 3.1-7 for planned land use designations in the study area.

On February 23, 2010, San Bernardino County adopted new development codes regulating renewable energy generation facilities (Chapter 84.29). The purpose of the new codes is to establish standards and permit procedures for the development, maintenance, and decommissioning of renewable energy generation facilities with the intention of ensuring that the facilities are designed and located in a manner that minimizes visual and safety impacts to the surrounding community. The adopted solar energy development standards establish structural setbacks from the property lines and special fencing standards. The County requires a closure plan that meets local, state, and federal standards, which must be submitted prior to the issuance of a County Building Permit. The County also stipulates that the proposed development meet all other County requirements including water resources, erosion and sediment control, air quality, biological resources, and cultural resources.

The San Bernardino County General Plan was adopted March 13, 2007. The land use and zoning designations adopted for the AMSP/Lockhart Substation site are exclusively RL, Rural Living. Land use designations surrounding the AMSP/Lockhart Substation site include RL; RL-40; and Resource Conservation, RC. These designations are depicted in Figure 3.1-1 and described in Table 3.1-1.

Table 3.1-1: Project Area General Plan Land Use Designations and Zoning

Land Use Designation	Permitted Uses/Description	Location as Shown on Figure 3.1-1
RL Rural Living	Allows 1 unit per 2½ acres with a 2½ gross acre parcel size. The land use zoning district allows a 20% maximum building coverage and a 35-foot height limit. Electric power generation is listed as a use that requires a conditional use permit. (SB Code Table 82-7)	Entire AMSP, Lockhart Substation site, and the SEGS northwest of the AMSP site. Several study area parcels and some surrounding properties are also zoned RL.
RL-40 Rural Living 40 acres	Same as above, but allows 1 unit per 40 acres with a minimum parcel size of 40 gross acres.	Study area of the AMSP/Lockhart Substation site north, east, and southeast.
RC Resource Conservation	Allows 1 unit per 40 acres with a gross minimum parcel size of 40 acres. The maximum building height is 35 feet.	Study area to the northeast and southwest of the AMSP/Lockhart Substation site.

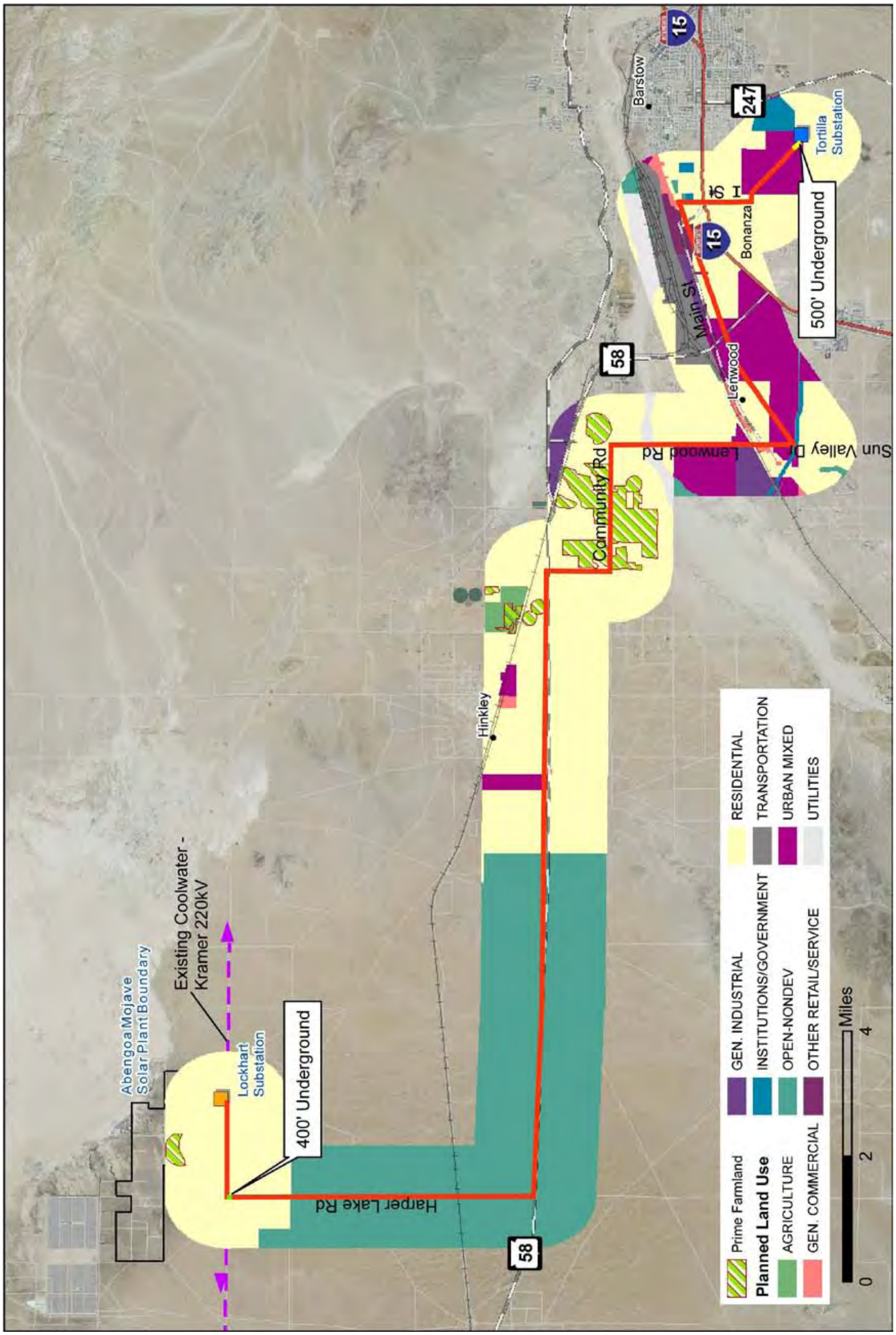


Figure 3.1-5: Planned Land Use – Lockhart to Tortilla

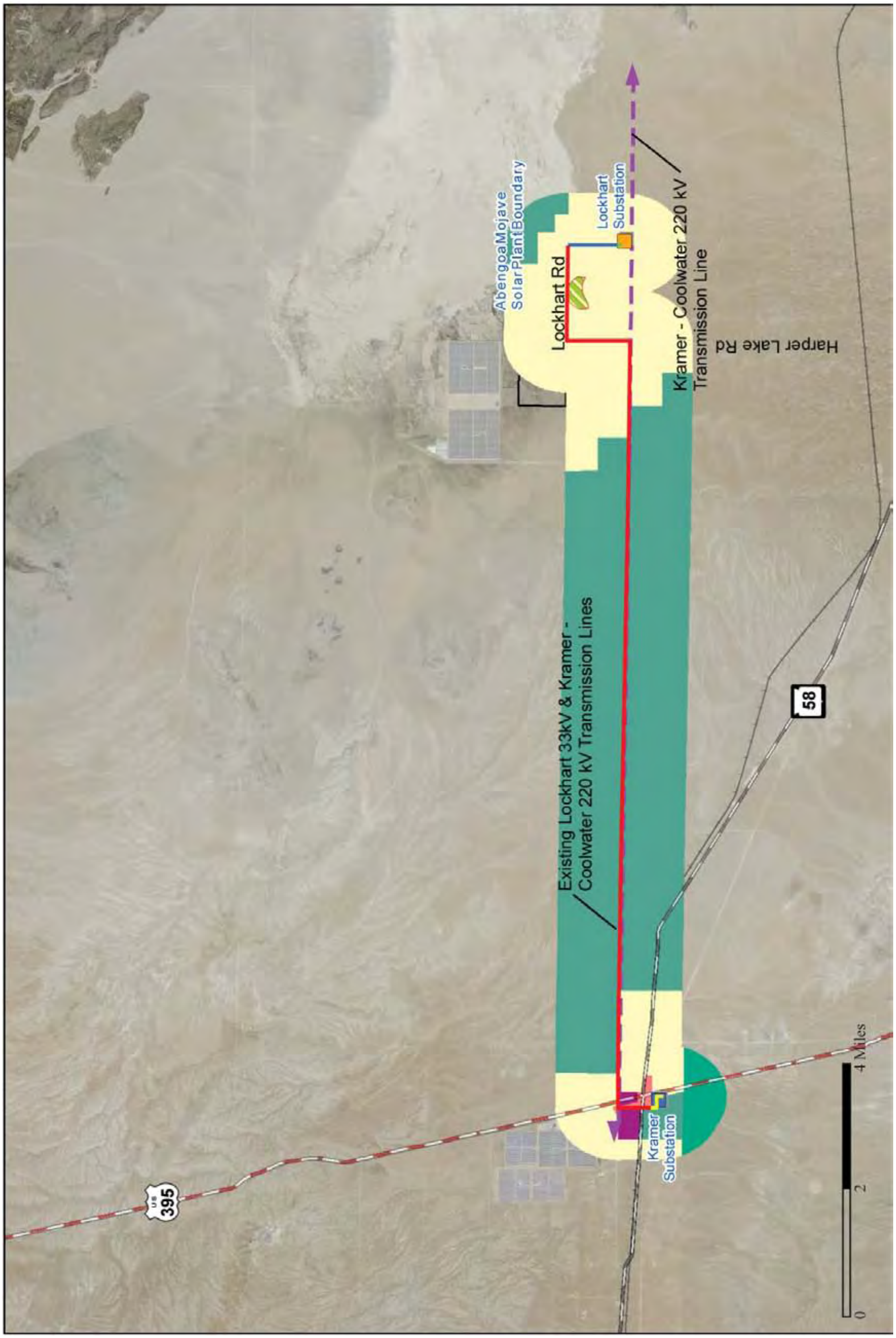


Figure 3.1-6: Planned Land Use – Lockhart to Kramer

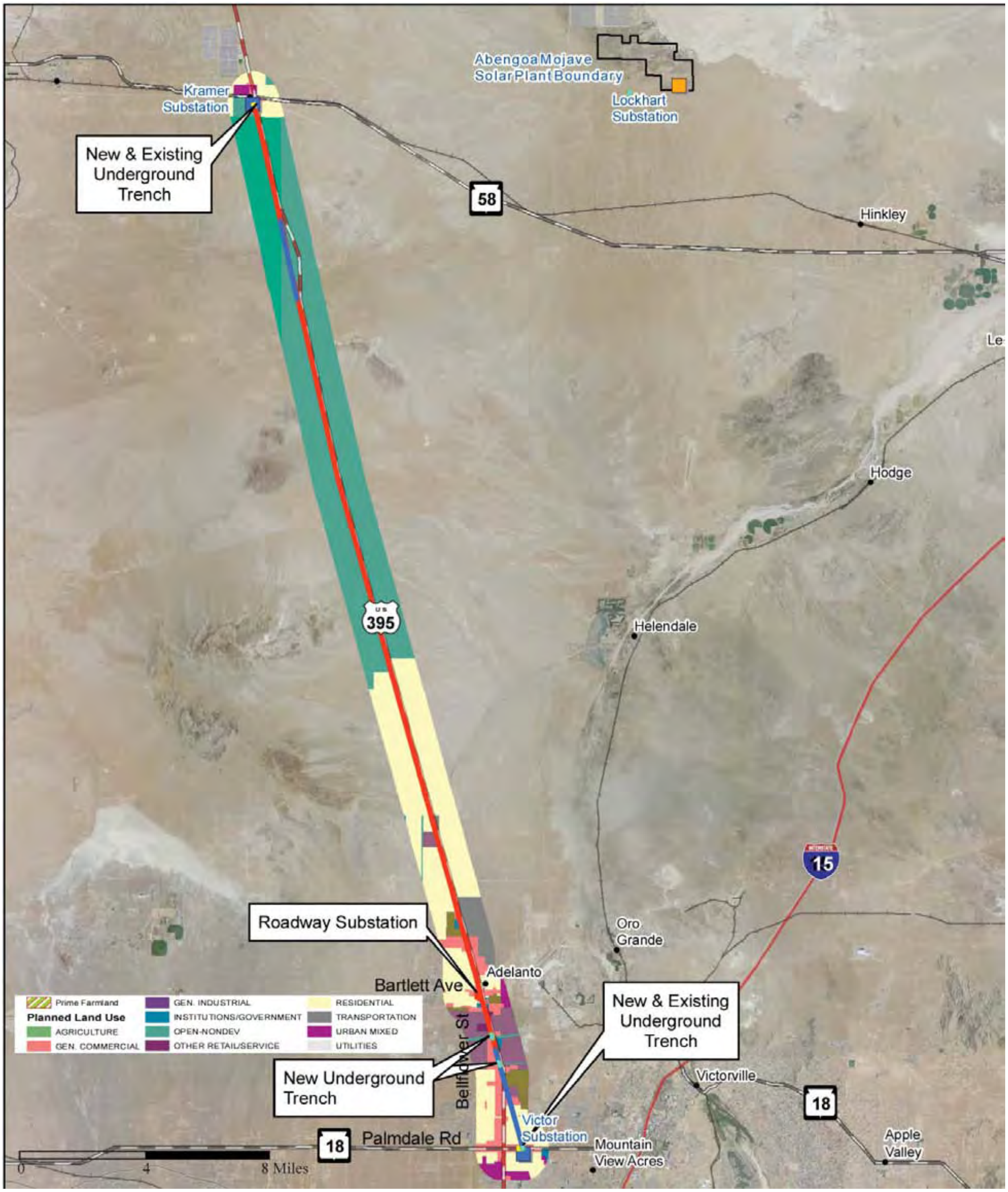


Figure 3.1-7: Planned Land Use – Kramer to Victor

Rural Living

RL is a residential zone that also allows agricultural and open space uses. The RL land use designation specifications are found in the San Bernardino County Code Section 82.04, Rural Living. Table 82-7 of the County Code lists the RL zone land uses, which include transportation, communication, and infrastructure facilities; and various types of uses requiring permit review, including electrical power generation, which is specified as requiring a conditional use permit.

Resource Conservation

The RC zone is an agricultural and resource management zoning district found on private land typically adjacent to the larger blocks of desert land managed by BLM. The applicable section of the Land Use Code is 82.03. The RC zone allows residences on a minimum of 40-acre parcels, allows farming but restricts livestock operations, and requires a conditional use permit for various mining and composting operations. Electrical power generation is prohibited in the RC zone.

<u>San Bernardino County General Plan Elements and Policies</u>

The San Bernardino County General Plan vision, goals, and policies provide guidance for County land uses and zoning and future development within the County. The General Plan includes the following elements: Land Use, Housing, Circulation and Infrastructure, Conservation, Open Space, Noise, Safety, Energy, and Economic Development. It also has an implementation program that addresses issues of permitting, capital development and financing, and various master plans.

<u>Land Use Element</u>

The County has stated that electric infrastructure is essential to serve growth and development in the County and allows electrical power generation in the RL zone with a conditional use permit. The San Bernardino County Land Use Element contains goals and policies for land use compatibility in the County. It requires cooperation and coordination with other relevant agencies, including the military. In addition, the General Plan includes specific goals and policies pertaining to the Desert Region. The applicable goals and policies are detailed in Appendix G.

City of Adelanto General Plan/Zoning

In the City of Adelanto, the proposed fiber-optic line would be strung on existing poles, new poles, and installed underground in three locations. All of the proposed fiber-optic line would be located within an existing utility corridor in a developed area, mostly paralleling U.S. Highway 395 and crossing a segment of undeveloped open space between U.S. Highway 395 and the Victor Substation. The fiber-optic line would be colocated in an existing utility corridor that would traverse several zoning classifications from low-density residential to commercial, community facility, and light industrial. The City's General Plan is silent regarding the colocation of utilities in the same corridor, or location of a new pole or trench in an existing utility corridor.

City of Barstow General Plan/Zoning

The fiber-optic line would be strung on existing poles within an existing utility corridor as the line enters Barstow. The City of Barstow allows the location of utility lines within ROWs in accordance with the California Public Utilities Commission (CPUC). The project Applicant received its CEC License Decision on September 8, 2010, and the SPS upgrades will be evaluated pursuant to CPUC CEQA requirements in a supplement to the CEC AFC.

City of Victorville General Plan/Zoning

The southern portion of the fiber-optic line and the Victor Substation is located within Victorville. The Victorville General Plan recommends that dry utilities follow roadways or existing utility corridors to facilitate maintenance. The proposed fiber-optic corridor would follow an existing utility corridor within the city limits and the trenching would prevent the fiber-optic cable from interfering with existing roads or utilities.

3.1.2 Study Methodology

The study methodology for the land use analysis includes an evaluation of the existing land uses and planned land uses and determines whether the proposed Project is compatible and identifies any conflicts with plans and policies. Plans and policies identified in Section 3.1.1 are assessed against the proposed Project.

The land use analysis addresses existing land uses within the 1,765-acre private parcel proposed for the AMSP and Lockhart Substation, as well as the interconnection to SCE's transmission system and the proposed fiber-optic telecommunication corridors. The study area also includes surrounding properties within 1 mile of the AMSP/Lockhart Substation site, and within 0.25 mile on both sides of the project's linear features (fiber-optic lines and gas pipeline). These areas are referred to collectively in the following discussion as the "study area" (see Figure S-1).

3.1.3 Affected Environment

3.1.3.1 AMSP and Lockhart Substation

Existing land uses in the AMSP and Lockhart Substation study area include scattered rural residences and farms, large open spaces, an existing solar thermal power plant, and the abandoned town of Lockhart. The proposed AMSP is located immediately south of an existing solar power plant owned by Florida Power & Light. The adjacent plant site is known as the Harper Lake Solar Electric Generating Station (SEGS VIII and IX), and referred to as SEGS. Harper Dry Lake is approximately 1,000 feet northeast of the site and has a wildlife viewing area that is accessible by Lockhart Ranch Road, an unimproved dirt road. The BLM viewing area is 0.5 mile north of the site. Rural residences and farms are sparsely located along Harper Lake Road south of Lockhart Road. The only access to the AMSP site is from Highway 58 and Harper Lake Road, which crosses the Atchison Topeka and Santa Fe railroad tracks approximately 3 miles south of the AMSP site.

Approximately 10 rural residences and small farms are located in the study area. Most of the homes are located approximately 50 to 1,000 feet from the AMSP/Lockhart Substation site. With the exception of Harper Lake Road, the roads in the AMSP study area are unimproved dirt roads. No community facilities, such as schools, stores, or recreational facilities, remain from the town of Lockhart, and no such services currently exist in the area. No new residential development was observed in the study area. The structures that once composed the town of Lockhart are now abandoned, collapsed, or in disrepair.

All of the existing homes in the study area are located south of the AMSP/Lockhart Substation site and south of Lockhart Ranch Road (Figure 3.1-8). Several properties (approximately 10 rural residences and farms) are located south of Lockhart Road and some farms and accessory structures are clustered in the eastern portion of the west half of Section 32. Approximately four rural residential properties are located on the west side of Harper Lake Road, approximately 0.75 to 1 mile south and west of the AMSP/Lockhart Substation site. These properties are along the west side of Harper Lake Road south of Lockhart Road; most are set back from the road 75 feet or more.

The proposed AMSP/Lockhart Substation site, and much of the surrounding study area, is on private lands within unincorporated San Bernardino County. The site is relatively flat, with elevations ranging from approximately 2,025 to 2,105 feet amsl. As noted previously, Harper Dry Lake and other BLM lands surround the site.

The adjacent SEGS VIII and IX projects went on-line in late 1989 and 1990 and are located north of the AMSP at Harper Lake Road and Hoffman Road. The two SEGS projects have a capacity of 160 MW of renewable electric power. Other SEGS projects were previously proposed on the AMSP site between 1989 and 1991, but the AFCs were never completed and the projects were suspended (CEC 2009).

3.1.3.2 Telecommunication System

The following discussion is organized by the three proposed fiber-optic routes.

The Lockhart to Tortilla Substation fiber-optic line falls within the limits of unincorporated San Bernardino County, as well as a portion of the incorporated City of Barstow for the southern portion of the route nearing the Tortilla Substation. The proposed overhead fiber-optic line between the Lockhart Substation and Harper Lake Road follows an existing utility corridor for 33-kV and 220-kV lines. Existing land uses along this stretch are similar to those described

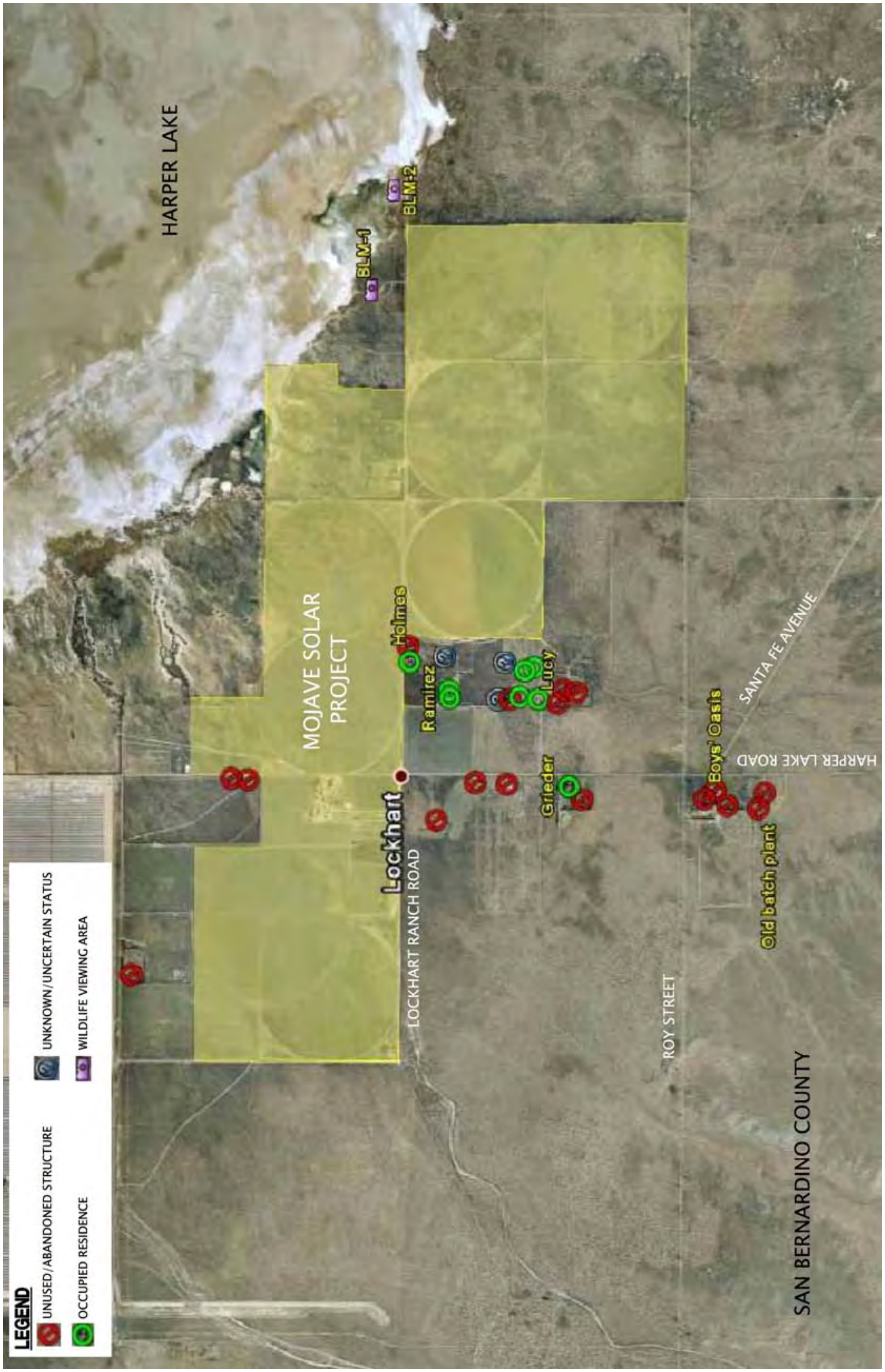


Figure 3.1-8: Existing Homes in the Study Area

previously for the substation site, primarily those of open space, agriculture, and rural residential. The nearest residence to this segment is situated approximately 260 feet to the west of Harper Lake Road. Existing land uses adjacent to the remainder of the route include residential, retail, open space, industrial, prime farmland, and agriculture. The proposed fiber-optic line would be strung on existing transmission line poles for a majority of this route (with the exception of three replacement poles and limited underground conduit), so the existing land use consists of utility easements, transmission structures, and line. The majority of the route is adjacent to open space or agricultural land uses. Residential, retail, commercial, and industrial land uses are found primarily within the limits of the City of Barstow and mostly to the south of Main Street. Some residential uses can be found scattered along SR-58, Summerset Road, Community Road, and Lenwood Road to the north of Main Street. Residential land uses are predominant along I Street and Siderite Road near the Tortilla Substation.

Existing land uses along the Lockhart to Kramer Substation fiber-optic line include mostly open space with limited agriculture and scattered rural residential uses. The entire route is either located within the limits of the AMSP site or within existing utility easements. The majority of this route follows the existing Lockhart 33-kV and Coolwater–Kramer No. 1 and No. 2 220-kV transmission line corridors in a vast area of undeveloped desert open space. As the route nears U.S. Highway 395, a mix of retail, commercial, and limited residential exists along the highway corridor. The intersection of SR-58 and U.S. Highway 395 includes service stations, restaurants, and other retail to serve motorists using these transportation corridors. The route enters the Kramer Substation, an industrial land use that blends with the urban land uses at the crossroads of U.S. Highway 395 and SR-58.

Existing land use along a majority of the Kramer to Victor Substation fiber-optic line consists of open space and U.S. Highway 395, marked only by the presence of the three existing electric transmission line corridors that the fiber-optic cable is proposed to be within. These corridors are situated in and adjacent to open space consisting of desert habitat and rolling terrain to the west. Open space abuts the highway and the cable corridor for more than half of this route’s distance. As the route nears the southern half, the open space gives way to more urban land uses, including residential, retail, commercial, and light industrial. The proposed cable route passes through mixed land uses and some open space before it crosses Palmdale Road and enters the Victor Substation.

3.1.3.3 Desert Tortoise Translocation Receptor Sites

Two specific receptor sites for desert tortoises have been identified. One of these is located on private land west of the AMSP. The second receptor area is on public lands south of the AMSP, and is located within critical habitat designated by USFWS (1994) as well as the Superior-Cronese Desert Tortoise Wildlife Management Area ACEC for conservation and enhancement of desert tortoises (WEMO 2006). These two areas consist of undisturbed desert tortoise habitat, and are described in detail in the draft Desert Tortoise Clearance and Relocation/Translocation Plan (see Appendix M).

3.1.4 Environmental Consequences

3.1.4.1 Proposed Action

3.1.4.1.1 AMSP and Lockhart Substation

The AMSP and Lockhart Substation site is located on currently vacant farmland because farming operations have ceased. The area surrounding the site is rural residential and farmland, habitat conservation areas, and a solar power plant. The proposed AMSP and Lockhart Substation would not conflict with the existing land uses and would be compatible with the adjacent SEGS. An established community does not exist in this area; therefore, the AMSP and Lockhart Substation would not physically divide an established community.

The AMSP and Lockhart Substation would not affect or conflict with existing plans of state government, local governments, or private entities for other developments in the vicinity of the proposed Project. The AMSP and Lockhart Substation would not conflict with the R-2508 Joint Land Use Study related to military airspace restrictions. Proposed development of the AMSP site was reviewed by NAVAIR Ranges, U.S. Navy and it has been determined that, although the plant is within the R-2525 military restricted airspace, it is unlikely to create conflicts with the military use of the airspace. This assessment is based on the understanding that the plant would be located near other similar structures and would not include transmission towers higher than the existing facilities in the area. The Navy has also reviewed the AMSP portion of the proposed Project for frequency spectrum impacts and indicated that the AMSP would require additional review prior to final design to ensure that it would not result in a substantive impact on military communications or result in frequency spectrum impedances (Parisi 2009b).

The AMSP would be consistent with the applicability of land use zoning districts designated for renewable energy generation. The AMSP and Lockhart Substation would be consistent with the San Bernardino County General Plan and the RL zoning designation with approval of a conditional use permit. However, because the AMSP is proposed to generate more than 50 MW of thermal electricity, facility permitting would be addressed under the Warren-Alquist Act power plant licensing process. Mojave Solar meets these requirements under the CEC License.

While there are no specific General Plan policies pertaining to solar power plants, the AMSP is compatible with policies that require protection of the County's environmental resources, such as the Harper Lake playa, cultural and paleontological resources, important wildlife habitat, air quality, and a balanced water regime. The AMSP siting has been sensitive to these issues by avoiding lands that are zoned RC and by siting the AMSP and Lockhart Substation on mostly fallow and previously disturbed land, and near another solar facility.

The AMSP and Lockhart Substation would have a positive influence on County Energy Element goals and policies that support future electric facility planning in the County. The County has stated in its policies that electric infrastructure is essential to serve growth and development in the County, and it allows electrical power generation in the RL zone with a conditional use permit.

All construction activities would take place within the AMSP site boundary or within existing utility corridor boundaries immediately to the south of the substation. While the interconnection elements extend south of the AMSP into BLM lands and land designated as RC, the facilities would not be located within a sensitive area defined in the WEMO Plan and the improvements would be within and consistent with the existing utility corridor structures, line, and improvements. The proposed facilities would be compatible with the proposed AMSP improvements, supporting the operation of that facility. No new land use impacts are identified for this element of the proposed Project.

The AMSP and the Lockhart Substation could potentially conflict with some of the County's General Plan goals and policies that direct the conservation, development, and utilization of the County's natural resources, including its agricultural resources. The AMSP/Lockhart Substation site would be intensively developed for solar generation in a rural area and would be partially inconsistent with the policies that require retention of native vegetation, native soils, and policies regarding vegetation clearing. Most of the vegetation that would be cleared would be fallow agricultural land with minimal native vegetation. As mentioned, some actively farmed land would also be removed from production for the AMSP. The CEC Decision (permit) was obtained for the AMSP in lieu of some of the local permits and resolves any conflict with County's General Plan goals and policies.

Siting of the AMSP and Lockhart Substation mostly on fallow agricultural land near the existing SEGS plant, rather than on more sensitive conservation lands or within an agricultural zoning district, or on critical habitat, is consistent with the General Plan Energy Element policy "to develop alternative energy technologies that have minimum adverse effect on the environment." This may help to protect sensitive and critical habitat by effectively clustering the electric facilities and avoiding potential impacts to other more sensitive habitat lands in the County. The AMSP and Lockhart Substation construction BMPs and design measures would minimize any adverse impacts to local residents. Refer to Sections 3.2, 3.3, 3.4, and 3.13 for more information on design measures and BMPs proposed for the AMSP and the Lockhart Substation.

The AMSP conflicts with the County's goal to equitably site energy facilities and avoid inappropriately burdening certain communities. Every effort would be made to mitigate the impacts; however, the AMSP and Lockhart Substation would involve construction in a small rural community that was previously subjected to similar solar development in the 1980s during construction of the SEGS VIII and IX projects. The AMSP and Lockhart Substation would be located adjacent to the southeast corner of SEGS and would be within 500 feet of existing homes and farms. Without standard BMPs and construction-phase environmental protection measures, construction of the AMSP and the Lockhart Substation has the potential to create dust and noise; however, these impacts would be minimized through implementation of BMPs and other construction and operation phase measures summarized in Sections 3.3 and 3.4 and listed in Appendix S. The AMSP and Lockhart Substation facilities, similar to the SEGS project, are not expected to substantially alter the rural quality of the area. The AMSP and the Lockhart Substation would be located in an area where a major solar facility already exists and would not contribute urban development or sprawl since it would not bring new services such as water or sewers, or include improvements in the transportation network of the area.

The County General Plan policies encourage the retention of existing native vegetation for new development projects to help conserve water, retain soil in place, and reduce air pollutants, but some native vegetation would be removed during construction. Measures proposed to avoid and minimize effects on plants and animals are summarized in Section 3.8 and listed in Appendix S. These measures are expected to reduce any substantive adverse impacts. The AMSP and the Lockhart Substation design would capture any site runoff in drainage channels on the site perimeter and this water would percolate into the groundwater table or be released in the eastern portion of the site near Harper Dry Lake.

3.1.4.1.2 Telecommunication System

The proposed fiber-optic telecommunication systems would use existing utility corridors through mostly rural and undeveloped areas. In locations where the fiber-optic line traverses developed areas, it would be strung on a combination of existing poles and new poles in established utility corridors and, therefore, would not physically divide established communities.

This proposed fiber-optic line, including the construction of approximately 10 to 15 new poles within the limits of Edwards Air Force Base near U.S. Highway 395, would not conflict with base operations, since the poles would be located within existing transmission line corridors and new poles would be dwarfed by the existing 500-kV and 220-kV towers along this route.

The proposed fiber-optic line would be consistent with the San Bernardino County General Plan or the city plans of Barstow, Adelanto, or Victorville. A conditional use permit is not required to string the new fiber-optic line on existing poles. New ROW acquisition for the transmission or telecommunication lines would not be necessary because the cables would be located within existing utility corridors. Therefore, negligible impacts would occur to existing land use along the corridor; current farming activities would likely continue within portions of the ROW. The planning and design of the fiber-optic line meets CEC regulations, which in turn comply with CPUC regulations and consequently the City’s General Plan.

The proposed fiber-optic line would not conflict with any applicable habitat conservation plan (HCP) or natural community conservation plan, nor convert existing farmlands or conflict with existing zoning for agricultural use or a Williamson Act contract because the cable would be primarily strung on existing utility poles, or trenched for short spans.

Land use impacts associated with the telecommunication line from Lockhart to the Tortilla Substation are projected to be minimal. The installation of the proposed fiber-optic cable would take place within existing utility corridors or within the existing Tortilla Substation boundary. Construction would include the installation of new overhead fiber-optic lines on existing structures, with the exception of where three replacement poles would be required, and limited underground trenching for cable conduit. Construction would not adversely affect the current land use in the area because existing utility corridors, transmission poles, and substation boundaries would be used and the proposed cable infrastructure would be compatible with the existing utility uses. Areas of the utility corridor in proximity to lands designated as Prime Farmland would not result in impacts to agricultural lands since improvements would remain within the existing corridors. No impacts to the WEMO Plan are expected. This segment of the telecommunication system would not conflict with existing or planned land uses.

Land use impacts associated with the Lockhart to Kramer Substation fiber-optic line are projected to be minimal. A portion of this fiber-optic route is located within the AMSP boundary (e.g., the new poles between the substation and Lockhart Road and the use of existing poles heading toward Harper Lake Road) where land use impacts were previously addressed for the AMSP and found not to be substantive. A majority of this line uses existing poles where the new cable would be compatible with the existing utility land use, and the easements are designated on planned land use maps. Proposed trenching at the Kramer Substation would be within the existing substation boundary, so this improvement would be compatible with that land use, an industrial use per the San Bernardino County General Plan.

Land use impacts associated with the Kramer to Victor Substation fiber-optic line are projected to be minimal. This route would be located entirely within the boundaries of existing utility easements and would be considered a compatible land use. A few segments of new poles and trenching are proposed as noted in Figure 2-13. The new poles would be compatible with the existing utility poles and trenching would only result in short-term adverse but not substantive impacts, such as noise and air quality impacts. Trenching proposed within the Kramer and Victor Substation boundaries would also be considered a short-term impact and would not conflict with the operations of those facilities.

3.1.4.2 No-Action Alternative

Under the No-Action Alternative, DOE would not issue Mojave Solar a loan guarantee for construction of the proposed Project and Mojave Solar would not proceed with the proposed Project. Absent the AMSP and the Lockhart Substation, the existing farmland would remain fallow and the SCE telecommunication system would not be improved as it relates to the AMSP and the Lockhart Substation.

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3.2 Visual Resources

3.2.1 Study Methodology

The visual resource analysis for the proposed AMSP and Lockhart Substation was conducted by 3DScape in 2009 for purposes of the CEC AFC process. That analysis is summarized herein for the DOE EA. Visual resources of the AMSP and Lockhart Substation area were investigated based on the following criteria:(1) existing visual quality and scenic attributes of the landscape; (2) location of sensitive receptors in the landscape and assumptions about receptors' concern for scenery and sensitivity to changes in the landscape, referred to as sensitivity levels; (3) the magnitude of visual changes in the landscape that would be brought about by implementation, construction, and operation of the proposed Project; and (4) compliance with state, county, and local policies for visual resources. Visual resources for the proposed fiber-optic lines were based on a site reconnaissance in February 2010 and a review of applicable plans, such as the County of San Bernardino General Plan and the WEMO Plan).

AMSP and Lockhart Substation

Baseline data for the AMSP/Lockhart Substation site were collected for the environmental setting using the following methodology:

- A general overview and site reconnaissance was conducted in April 2009, followed by independent site reconnaissance and site analysis by the CEC AFC visual analyst contractors.
- Locations of sensitive receptors were noted on U.S. Geological Survey (USGS) topographic maps showing highways, roads, residences, and the BLM watchable wildlife area.
- Viewpoints were identified from which the proposed AMSP and Lockhart Substation would be seen.
- From all viewpoints investigated, the most critical views were selected as "waypoints" (possible Key Observation Points [KOPs]), and landscape photographs were taken from these viewpoints. At each waypoint, a Global Positioning System (GPS) reading of latitude, longitude, and elevation was recorded.
- From all waypoints, the eight most critical were selected as KOPs for analysis, based on their ability to exemplify visual resource impacts at a particular location. KOPs that were analyzed are representative of project-induced visual resource impacts to this particular landscape.
- Computerized visual simulations were carefully constructed based on existing landscape photography, three-dimensional computer models of proposed Project features, USGS topographic maps, and grading plans provided by Mojave Solar showing the AMSP and Lockhart facilities.

Photographs of existing landscape conditions and computer-generated visual simulations are provided in this section to accurately portray the proposed AMSP and Lockhart Substation and changes to the visual character of the landscape. Eight simulations present views from seven different locations that were selected as KOPs for purposes of the visual resources evaluation. Two of the simulations (labeled as KOP-6 and KOP-7) were taken at the same vantage point, but looking in different directions—south and west, respectively. The KOPs are shown in Figure 3.2-1, Key Observation Points.

The character of a landscape is the overall impression created by its unique combination of visual features (such as land, vegetation, water, and structures) as seen in terms of form, line, color, and texture. (BLM 1986a) Overall landscape visual quality was evaluated in the range of high, moderate, or low, based on the visual resource management systems of the BLM (1986a), U.S. Department of Transportation Federal Highway Administration (1988), and U.S. Forest Service (1995). The elements of the rating scale are defined below:

- High Visual Quality: These landscapes contain natural and/or cultural elements of high-quality scenic value. Areas of high visual quality have the most variety and most harmonious compositions for the landscape character type.
- Moderate Visual Quality: These landscapes contain natural and/or cultural elements of moderate scenic value. Visual variety and compositions are average for the landscape character type.
- Low Visual Quality: These landscapes contain natural and/or cultural elements of low scenic value. Visual variety and compositions are either missing or below average for the landscape character type.

Part of the quality analysis includes the assessment of light and glare from the solar troughs, night lighting, and other solar plant effects. Potential light and glare impacts with regard to visual resources considers the following:

- Artificial sky glow: The brightening of the night sky attributable to human-created sources of light.
- Glare: Light that causes visual discomfort or disability or a loss of visual performance.
- Spill light: Light from a lighting installation that falls outside of the boundaries of the property on which the installation is sited.
- Light trespass: Spill light that because of quantitative, directional, or type of light causes annoyance, discomfort, or loss in visual performance and visibility.

Visual quality judgments were made by the visual analysts based on professional qualifications and experience applying criteria that include the following elements:

- Landscape features, including topography, water features, and vegetation;

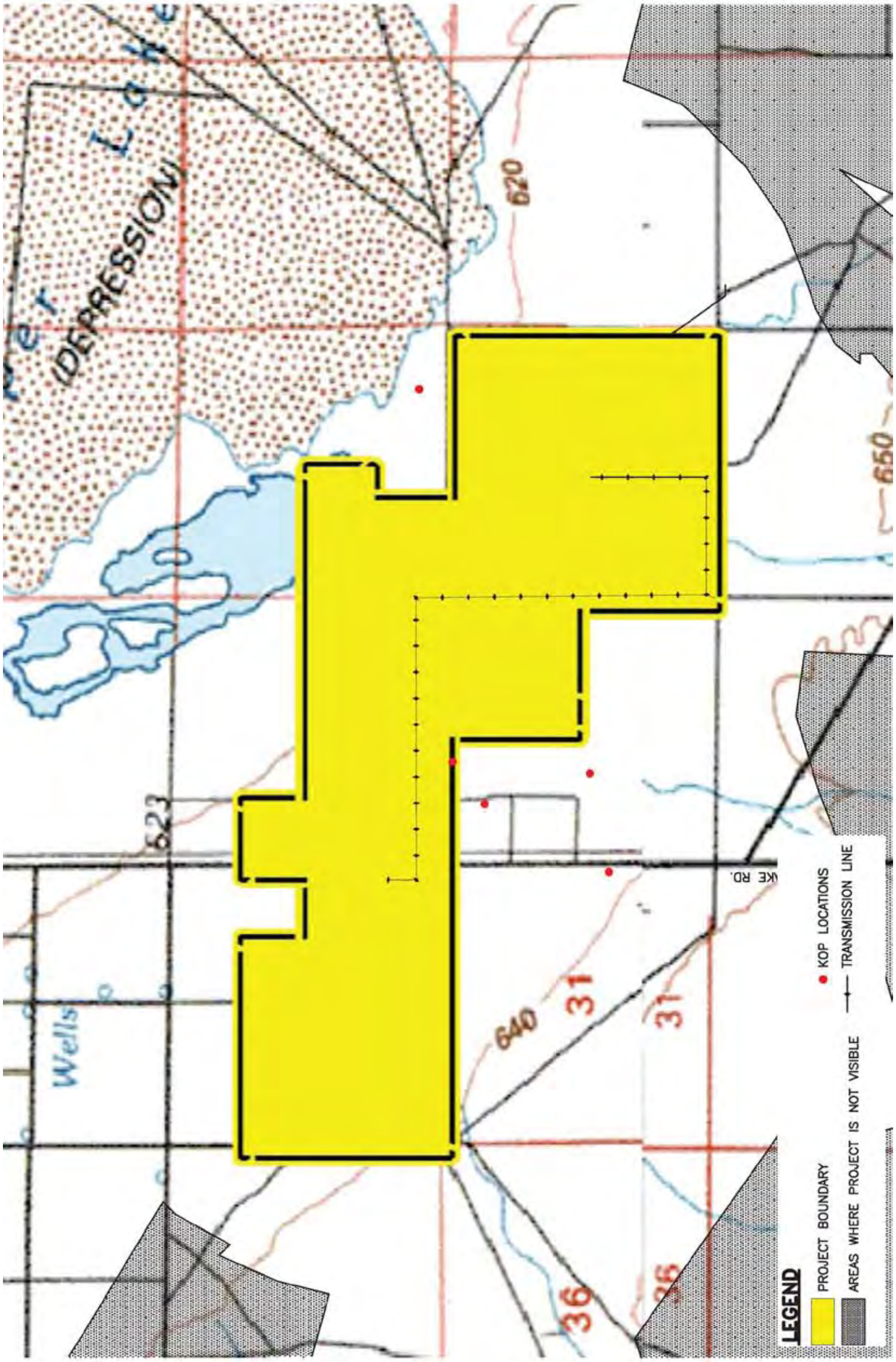


Figure 3.2-1: Key Observation Points

- Cultural alterations and built structures, including roads, agricultural fields, residences, and outbuildings; and
- Dominance elements in the characteristic landscape, including form, line, color, texture, and scale of landscape features and cultural alterations.

Regional visibility of the AMSP and Lockhart Substation provides a generalized indication of the proposed Project viewshed, i.e., the areas from which the proposed power plant and substation are likely to be visible. Determination of the AMSP and the Lockhart Substation's viewshed was based on a review of site engineering drawings, placement of an imaginary computerized "observer" half way to the top of the Steam Turbine Generator Building (the tallest structure in the power block), and a computerized digital terrain model, upon which a visibility viewshed analysis was performed using Geographic Information Systems (GIS) technology. The boundaries of the viewshed were set at 15 miles from each power block because elements of a view that are 15 miles or more from the viewpoint are considered part of the seldom seen area (BLM 1986a). The viewshed map indicates two categories of visibility: (1) those areas in which the tallest solar plant features are likely to be generally visible, and (2) those areas in which views toward the AMSP/Lockhart Substation site are likely to be blocked by topographic features, according to the digital terrain model.

For purposes of describing the existing visual setting (Affected Environment), several factors are inventoried to evaluate the effect the Project would have on visual resources and characteristic landscapes. Those factors are defined below.

Viewer Exposure describes the degree to which viewers are exposed to views of the landscape. Viewer exposure considers landscape visibility (the ability to see the landscape), distance zones (proximity of viewers to the subject landscape), number of viewers, and the duration of view. Landscape visibility can be a function of several interconnected considerations including proximity to viewing point; degree of discernible detail; seasonal variations (snow, fog, and haze can obscure landscapes); time of day; and presence or absence of screening features such as landforms, vegetation, and/or built structures.

Viewer Concern addresses the level of interest or concern of viewers regarding an area's visual resources and is closely associated with viewers' expectations for the area. It reflects the importance placed on a given landscape based on the human perceptions of the intrinsic beauty of the existing landforms, rockforms, water features, vegetation patterns, and even cultural features.

Visual Quality is a measure of the overall impression or appeal of an area as determined by the particular landscape characteristics such as landforms, rockforms, water features, and vegetation patterns, as well as associated public values. These characteristics contribute to visual quality classifications of indistinctive (low), common (moderate), and distinctive (high). Visual quality is a point of reference to assess whether a given project would appear compatible with the established features of the setting or would contrast noticeably and unfavorably with them.

Overall Visual Sensitivity is a concluding assessment related to an existing landscape's susceptibility to an adverse visual outcome. A landscape with a high degree of visual sensitivity is able to accommodate a lower degree of adverse visual change without resulting in a significant visual impact. A landscape with a low degree of visual sensitivity is able to accommodate a higher degree of adverse visual change without resulting in a significant visual impact. Overall visual sensitivity is derived from a comparison of existing visual quality, viewer concern, and viewer exposure.

For purposes of assessing the environmental effects of the proposed AMSP and Lockhart Substation (Environmental Consequences), the following factors are addressed for each of the KOPs. Each of these factors is also generally expressed as low, moderate, or high.

Visual Contrast describes the degree to which a project's visual characteristics or elements (consisting of form, line, color, and texture) differ from the same visual elements established in the existing landscape. The degree of contrast can range from low to high. The presence of forms, lines, colors, and textures in the landscape similar to those of a project indicates a landscape more capable of accepting those project characteristics than a landscape where those elements are absent. This ability to accept alteration is often referred to as visual absorption capability and typically is inversely proportional to visual contrast.

Project Dominance is a measure of a feature's apparent size relative to other visible landscape features and the total field of view. A feature's dominance is affected by its relative location in the field of view and the distance between the viewer and the feature. The level of dominance can range from subordinate to dominant.

View Blockage or Impairment describes the extent to which any previously visible landscape features are blocked from view as a result of the project's scale and/or position. Blockage of higher-quality landscape features by lower-quality project features causes adverse visual impacts. The degree of view blockage can range from none to high.

Overall Visual Change is a concluding assessment as to the degree of change that will be caused by a project. Overall visual change is derived from a comparison of resulting visual contrast, project dominance, and view blockage.

Telecommunication System

Since a majority of the proposed fiber-optic cables are proposed to be strung on existing transmission line poles and within existing utility corridors, the visual analysis for this element of the proposed Project focuses on where the project crosses BLM land and where new visual elements are being proposed, including these three project components: (1) the seven replacement poles found along the Lockhart to Tortilla and Lockhart to Kramer routes; (2) new interset poles along the Kramer to Victor route, west of U.S. Highway 395 near Kramer Hills;

and (3) new interset poles between the Victor Substation and approximately 3.4 miles north of the substation. Existing photos, site reconnaissance of the visual setting, and review of plans for potential sensitive viewsheds were included in this analysis for the fiber-optic lines.

Approximately 17 miles of the proposed 85-mile fiber-optic cables would be strung on existing and new transmission line structures within existing utility corridors that cross public lands managed by BLM under the WEMO Plan (2005), which is an amendment to the CDCA Plan of 1980. Public lands in this part of the CDCA have not been formally inventoried for visual resources. The CDCA Plan prescribes the following visual resource management actions for activities that involve the alteration of the natural character of the landscape:

1. The appropriate levels of management, protection, and rehabilitation of all public lands in the CDCA will be identified, commensurate with visual resource management objectives in the multiple-use guidelines.
2. Proposed activities will be evaluated to determine the extent of change created in any given landscape and to specify appropriate design or mitigation measures using BLM's contrast rating process.

The transmission line corridors are within a Multiple-Use Class L (Limited Use) designated area within the CDCA. This designation protects scenic resource values, among other sensitive resource values. A Visual Resource Inventory (VRI) should be conducted for projects in lieu of an existing VRI to be consistent with the CDCA visual resource guidelines for identifying the appropriate levels of management, protection, and rehabilitation of visual resources in Class L areas. The VRI consists of a scenic quality evaluation, sensitivity level analysis, and a delineation of distance zones, as detailed in BLM Visual Resource Management (VRM) Manual 8410 (BLM 1986a). Based on these three factors, BLM lands are categorized into one of four VRI classes. The VRI classes represent the relative value of the visual resources, with Classes I and II being the most valued, Class III representing a moderate value, and Class IV being of least value. The VRI classes provide the basis for developing management objectives for visual resources, which are implemented through the establishment of VRM classes. The VRI classes identified for BLM lands affected by the installation of fiber-optic cable serve as interim VRM classes for the evaluation of the impacts from the proposed Project. The VRI factors of scenic quality, sensitivity level, and distance zones are defined below:

Scenic Quality – Scenic quality is a measure of the visual appeal of a tract of land. In the visual resource inventory process, public lands are give an A, B, or C rating based on the apparent scenic quality, which is determined using seven key factors: landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. During the rating process, each of these factors is ranked on a comparative basis with similar features within the physiographic province.

Sensitivity Level – Sensitivity levels are a measure of public concern for scenic quality. Public lands are assigned high, medium, or low sensitivity levels by analyzing the various indicators of public concern.

Distance Zones – Landscapes are subdivided into three distanced zones based on relative visibility from travel routes or observation points. The three zones are: foreground-middleground, background, and seldom seen. The foreground-middleground (fm) zone includes areas seen from highways, rivers, or other viewing locations which are less than 3 to 5 miles away. Seen areas beyond the foreground-middleground zone but usually less than 15 miles away are in the background (bg) zone. Areas not seen as foreground-middleground or background (i.e., hidden from view) are in the seldom-seen (ss) zone.

The scenic quality, sensitivity level, and distance zones are combined to assign the VRI Class to inventoried BLM lands as shown in the following matrix.

Ratings to Determine BLM VRI Classes

<table>
<tr><td>Sensitivity Level</td><td></td><td colspan="3">High</td><td colspan="3">Medium</td><td>Low</td></tr>
<tr><td>Special Areas</td><td></td><td>I</td><td>I</td><td>I</td><td>I</td><td>I</td><td>I</td><td>I</td></tr>
<tr><td rowspan="7">Scenic Quality</td><td>A</td><td>II</td><td>II</td><td>II</td><td>II</td><td>II</td><td>II</td><td>II</td></tr>
<tr><td rowspan="2">B</td><td rowspan="2">II</td><td rowspan="2">III</td><td>III*</td><td rowspan="2">III</td><td rowspan="2">IV</td><td rowspan="2">IV</td><td rowspan="2">IV</td></tr>
<tr><td>IV*</td></tr>
<tr><td>C</td><td>III</td><td>IV</td><td>IV</td><td>IV</td><td>IV</td><td>IV</td><td>IV</td></tr>
<tr><td></td><td>fm</td><td>b</td><td>ss</td><td>fm</td><td>b</td><td>ss</td><td>ss</td></tr>
<tr><td></td><td colspan="7">DISTANCE ZONES</td></tr>
</table>

fm – foreground-middleground
b – background
ss – seldom seen

The BLM lands within and adjacent to the existing utility corridors are within the Mojave Desert physiographic province, which is characterized by long, north-south-trending mountain ranges separated by broad valleys sparsely vegetated with creosote bush and cacti (USGS 2004). The utility corridor landscape is common to the physiographic province. There are few interesting features and there is little variety in the terrain, vegetation, and color of the visual setting. The scenic quality is rated as Class C, which is typical of the majority of the landscape in the CDCA.

The utility corridors on BLM lands are visible primarily from U.S. Highway 395, SR-58, and other local roads in and around Bartow. Motorist viewsheds change with the moving vehicle, so that the affected BLM lands would be visible to motorists for relative brief moments. However, the importance of visual values increases as the number of viewers increase. There would be a relatively large number of viewers on U.S. Highway 395. Based on the high number of viewers on the highway and connecting local roads, the overall sensitivity level is high.

The utility corridors on BLM lands are within the foreground-middleground distance zone of U.S. Highway 395, SR-58, and other local roads. Portions of the corridors are adjacent to the highways, which equates to being within the immediate foreground distance zone (less than 0.5 mile from viewpoint).

Using the VRI matrix shown above, the interim VRI Class would be Class III for BLM lands within and adjacent to the existing utility corridors. Based on the VRI Class, the appropriate level of visual resource management for the proposed fiber-optic route study areas would be VRM Class III. The objective of this class is to at least partially retain the existing character of the landscape. A moderate change to the characteristic landscape is allowed, and management activities may attract the attention of a casual observer but must not dominate the view. Changes should imitate the basic elements of the natural features of the landscape.

Evaluation of proposed activities to determine the extent of change to the characteristic landscape involves determining whether the potential visual impacts meet the management objectives (VRM class) established for the area, or if design adjustments will be required to meet VRM objectives. A visual contrast rating process is used for this analysis, which involves comparing the project features with the major features in the existing landscape using the basic design elements of form, line, color, and texture. This process is described in BLM Handbook H-8431-1, Visual Resource Contrast Rating (BLM 1986b). The visual resource analysis of the proposed fiber-optic cable and associated infrastructure, pursuant to BLM guidelines, is included in Section 3.2.2.2 further below.

3.2.2 Affected Environment

3.2.2.1 AMSP and Lockhart Substation

The AMSP/Lockhart Substation site is situated in unincorporated San Bernardino County in the Harper Lake Valley of the western Mojave Desert. The Mojave Desert is a subsection of the Basin and Range Physiographic Province, which is visually characterized by long, north-south-trending mountain ranges separated by broad valleys. With respect to regional geographic features, the AMSP/Lockhart Substation site is a large, flat planar landscape that slopes northeast toward Harper Dry Lake, with no distinctive geographic features onsite.

Harper Dry Lake is a dry alkaline lake bed in the middle of this basin landscape, and the lake bed is situated northeast of the solar plant site. Approximately 8 miles northeast of the AMSP site, and beyond the dry lake bed, is Black Mountain, a wilderness area managed by BLM. Four miles east-southeast of the AMSP site is Lynx Cat Mountain, and along with an unnamed butte south of SR-58, these landforms create what is locally known as the Hinkley Divide. SR-58 is eligible for scenic highways status because plants indigenous to the area along the route occasionally have good scenic qualities when wildflowers are in bloom.

The existing SEGS VIII and IX are located just northwest of the AMSP site. Neither the proposed AMSP/Lockhart Substation site nor the existing SEGS facilities are visible from anywhere along SR-58, because of topographic screening.

In the vicinity of the AMSP/Lockhart Substation site, the only existing fixed light sources are found at the existing SEGS VIII and IX on Hoffman Road, where lights are on at night for security and maintenance of the facility. There are fixed light sources at approximately 10 rural residences and small farms that are located in the vicinity within 1 mile of the AMSP/Lockhart Substation site. These fixed light sources tend to be typical high-intensity “farm” lights mounted on moderately tall wooden poles. There are no existing public street lights within the AMSP and Lockhart Substation vicinity. Transitory nighttime light and glare are produced by headlights from moving vehicles.

There is nighttime sky glow from developed areas outside the immediate vicinity of the AMSP/Lockhart Substation site. Specifically, the City of Barstow to the southeast and Kramer Junction to the southwest produce nighttime sky glow. Otherwise, the area is generally very dark after sunset. The current nighttime views are considered to have high value.

The site is relatively flat and bound by existing dirt roads to the west and south, and existing electric transmission line corridors south of the substation where the interconnection is proposed. The overall visual setting can be described as rural, agricultural, open space marked by east-west electric transmission line corridors. Refer to Figures 3.2-2, 3.2-3, and 3.2-4 for all photos referenced in this section.

An analysis of existing visual conditions of the eight KOPs associated with the AMSP and Lockhart Substation is provided below. The basis of selecting the KOPs was that each one displays a different sensitive receptor location from which the solar plant would be visible, and that accurately represents how the AMSP and the Lockhart Substation would appear when seen from different distance zones: foreground-middleground; and background. Eight KOPs were selected to evaluate the AMSP/Lockhart Substation site’s existing conditions and potential visual impacts.

<u>KOP-1 – Harper Lake Road near Phoenix Road</u>

KOP-1 is located on Harper Lake Road near Phoenix Road (Figure 3.2-5). Phoenix Road is an east-west, one-lane dirt road that is part of a platted, undeveloped subdivision in the Mojave Desert, south of the proposed solar plant and east of Harper Lake Road. KOP-1 is located approximately 0.25 mile north of Phoenix Road.

The speed limit posted on Harper Lake Road is 55 miles per hour (mph); however, speed of travel tends to be approximately 45 to 55 mph because it is restricted by the rolling nature of the landscape. The view north from KOP-1 is one of the first viewing opportunities as motorists travel north from SR-58 on Harper Lake Road. The solar plant site is not visible from SR-58 because of the rolling nature of the desert landform. The proposed AMSP/Lockhart Substation

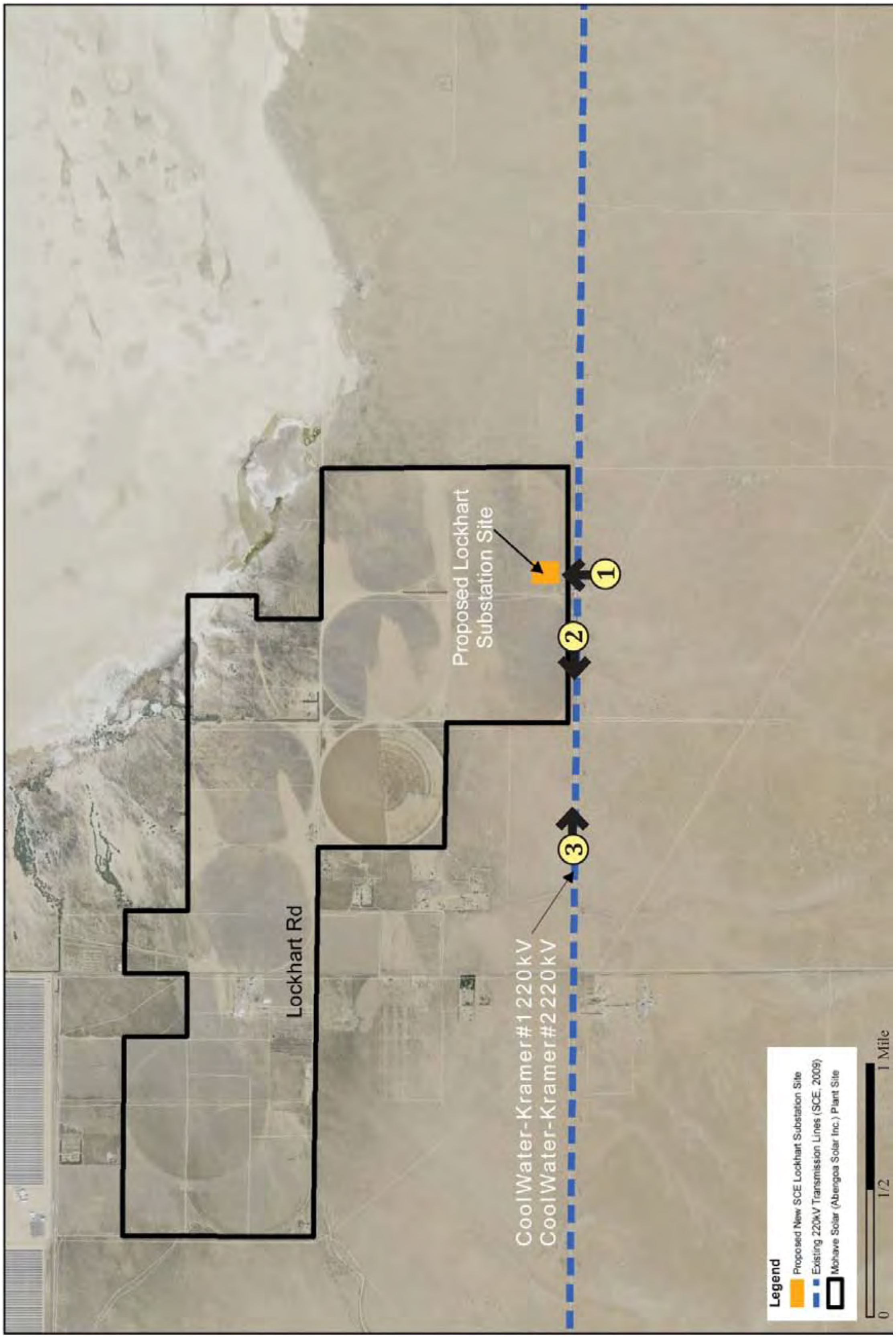


Figure 3.2-2: Photo Key Map 1

Figure 3.2-3: Photo Key Map 2

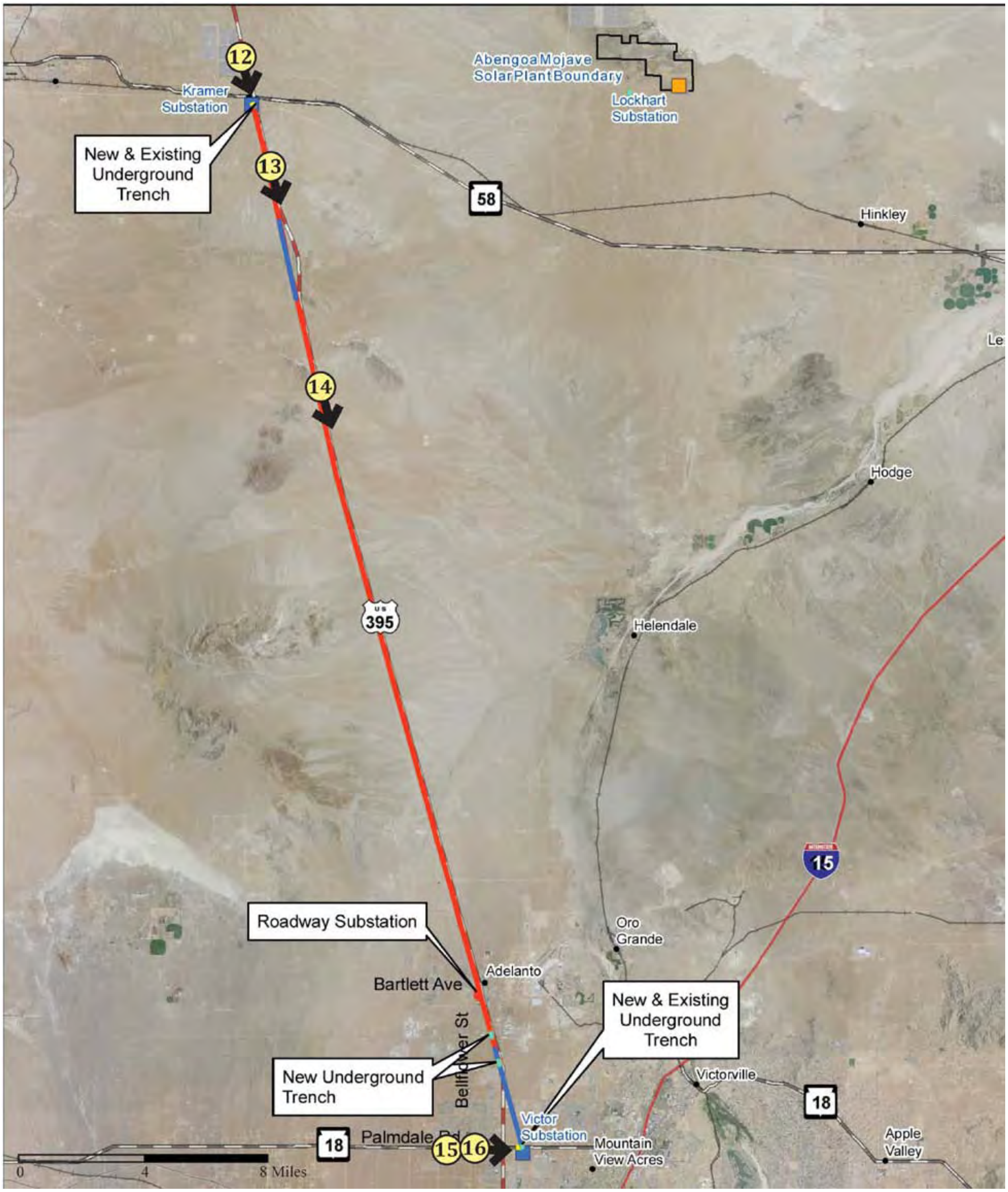


Figure 3.2-4: Photo Key Map 3

Figure 3.2-5: KOP-1 Existing Conditions at Harper Lake Road Near Phoenix Road

site is approximately 3 to 4 miles from KOP-1. This is a middleground viewing distance to the solar plant site. Overall, the landform appears very flat and devoid of interesting features, except for Black Mountain on the horizon at the right side of the photograph (Figure 3.2-5). Wooden electric distribution poles line the left (west) side of Harper Lake Road, creating some of the only vertical landscape elements in the foreground. Three electric transmission lines are visible in the middleground, crossing the view from right to left in an east-west direction. These are the existing 220-kV Coolwater-Kramer transmission lines No. 1 and No. 2, and the existing 500-kV Mead-Adelanto transmission line that are located along Utility Road. These three transmission lines with their lattice steel towers create additional vertical lines in this otherwise horizontal landscape.

Viewer Exposure: Low. Visibility to the AMSP/Lockhart Substation site is limited as seen from KOP-1 and the number of viewers on Harper Lake Road is low (as compared to other vantage points, such as SR-58, which is farther away to the south, or the City of Barstow).

Viewer Concern: Low-to-moderate. Residents and visitors enjoy the predominantly natural setting with middleground panoramic sightlines to the Mojave Desert, Harper Dry Lake, and Black Mountain. Travelers on Harper Lake Road can be expected to have low-to-moderate concern for visual impacts from the proposed AMSP and Lockhart Substation features because they are subjected to similar views of the nearby existing SEGS facilities on a daily basis. Overall, viewer concern is estimated to be low-to-moderate.

Visual Quality: Low. The primary focal point in this landscape is the road, which creates a strong linear feature leading into the distance. A secondary focal point is Black Mountain on the right side of the view, on the skyline. There are no distinctive or interesting landform features, vegetative patterns, water features, or cultural features in this view, leading to an overall low visual quality for the AMSP site.

Overall Visual Sensitivity: Low. For workers, visitors, and residents traveling on Harper Lake Road looking toward the proposed AMSP/Lockhart Substation site, and from KOP-1 specifically, the low viewer exposure, low-to-moderate viewer concern, and low visual quality lead to a low overall visual sensitivity of the visual setting and viewing characteristics.

<u>KOP-2 – Harper Lake Road South of Roy Road</u>

KOP-2 is located on Harper Lake Road south of Roy Road, heading northbound (Figure 3.2-6). At this point on Harper Lake Road, there is a windbreak on the left side of the road. The landscape is predominantly flat with native desert vegetation. The only vertical lines are those created by the wooden distribution poles carrying electric and telephone lines. The dominant focal point in this landscape is the road itself, reinforced by the repetitive pattern of wooden utility poles on the left side of the road, leading the viewers' eyes to the flat horizon. Black Mountain is a secondary focal point on the skyline at the far right side of this view. Two or three scattered rural residences are visible on the left side of the road. The AMSP/Lockhart Substation site is approximately 0.75 mile away from KOP-2, making this a middleground viewing distance.

Figure 3.2-6: KOP-2 Existing Conditions at Harper Lake Road South of Roy Road

Viewer Exposure: Moderate. There is very little landscape screening by landforms or vegetation and the AMSP and Lockhart Substation would be physically visible in the middleground. Due to the flatness of the landform, visibility to the AMSP/Lockhart Substation site is limited as seen from KOP-2. The number of viewers is low on Harper Lake Road and for the scattered rural residences. For viewers on Harper Lake Road, the duration of view would be brief because of the speed of travel. For residents living in the vicinity, duration of view would be extended, leading to a moderate viewer exposure.

Viewer Concern: Low-to-moderate. Residents and visitors enjoy the predominantly natural setting with middleground panoramic sightlines to the Mojave Desert, Harper Dry Lake, and Black Mountain. Travelers on Harper Lake Road can be expected to have low-to-moderate concern for visual impacts from the proposed AMSP and Lockhart Substation features, because they are subjected to similar views of the nearby existing SEGS facilities on a daily basis. Overall, viewer concern is estimated to be low-to-moderate.

Visual Quality: Low. The primary focal point in this landscape is the road, which creates a strong linear feature leading into the distance. A secondary focal point is Black Mountain on the right side of the view, on the skyline. There are no distinctive or interesting landform features, vegetative patterns, water features, or cultural features in this view, leading to an overall low visual quality for the view toward the AMSP/Lockhart Substation site.

Overall Visual Sensitivity: Low-to-moderate. For workers, visitors, and residents traveling on Harper Lake Road looking toward the proposed AMSP/Lockhart Substation site, the moderate viewer exposure, low-to-moderate viewer concern, and low visual quality lead to a low-to-moderate overall visual sensitivity of the visual setting and viewing characteristics.

<u>KOP-3 – Roy Road East of Edie Road</u>

KOP-3 is located on Roy Road east of Edie Road, looking east-northeast (Figure 3.2-7). Roy Road dead-ends at this KOP location, and KOP-3 represents a typical view for three residences along Roy Road. The landscape in this vicinity is not distinctive, consisting of a flat desert plain covered with native creosote bush scrub and grasses. Beyond the fence line of wooden posts, which is a property line for the proposed Project, there is a fallow agricultural field and a windbreak that runs north-south in the landscape.

Viewer Exposure: Moderate. Due to the lack of landscape screening by landforms or vegetation, the proposed AMSP/Lockhart Substation site is physically visible, but because of the flat topography and angle of view, visibility of the site is moderate. The proposed solar plant and substation would contain vertical elements that would be highly visible in the foreground from KOP-3. The number of viewers in this area is low. The flat viewing angle, foreground distance zone, relatively low number of viewers, and extended duration of view leads to a moderate viewer exposure rating.

Figure 3.2-7: KOP-3 Existing Conditions at Roy Road East of Edie Road

Viewer Concern: High. People living in these three rural residences can be expected to have high concern for changes in their personal views of the adjoining landscape. While conducting this study, the visual analysts made no attempt to contact the residents who live in the vicinity of KOP-3. Due to the difficulty in inventorying for every individual's sensitivity level, it was determined that all residential viewers within 0.5 mile of the proposed AMSP (foreground distance zone) may have a high level of concern related to changes occurring in landscapes in the AMSP and Lockhart Substation vicinity.

Visual Quality: Low. There is no primary focal point in this landscape, and the flat horizontal land plain is devoid of distinguishing characteristics. The horizon, several miles away, repeats the flat horizontal appearance. Black Mountain is out of view, to the left of this view. Lynx Cat Mountain is barely visible on the right side of this view, to the southeast. There are no distinctive or interesting landform features, vegetative patterns, water features, or cultural features in this view, leading to an overall low visual quality for the AMSP and the Lockhart Substation site.

Overall Visual Sensitivity: Moderate. For residents traveling on Edie Road or living in the three rural residences in this vicinity and looking toward the proposed AMSP/Lockhart Substation site, and from KOP-3 specifically, the moderate viewer exposure, high viewer concern, and low visual quality lead to a moderate overall visual sensitivity of the visual setting and viewing characteristics.

<u>KOP-4 – Edie Road South of Lockhart Ranch Road</u>

KOP-4 is located on Edie Road south of Lockhart Ranch Road near the driveway to a rural residence, looking east-southeast (Figure 3.2-8). The primary focal points in this landscape view are the driveway leading to the house and scattered outbuildings, with scattered evergreen trees around the homestead. An overhead distribution line for electricity and telephone is visible on the horizon, with several widely scattered wooden poles creating contrasting vertical elements in this otherwise horizontal landscape. In the center of this view, Lynx Cat Mountain forms a minor secondary focal point on the skyline.

Viewer Exposure: Moderate. Due to the lack of landscape screening by landforms or vegetation, the proposed AMSP/Lockhart Substation site is physically visible, but because of the flat topography and angle of view, visibility of the site is moderate. The AMSP and Lockhart Substation would contain vertical elements (e.g., stands of solar troughs) that would be highly visible in the foreground from KOP-4. The flat viewing angle, foreground distance zone, relatively low number of viewers, and extended duration of view lead to a moderate viewer exposure rating.

Figure 3.2-8: KOP-4 Existing Conditions at Edie Road South of Lockhart Ranch Road

Viewer Concern: High. People living in these three rural residences can be expected to have high concern for changes in their personal views of the adjoining landscape. It was determined that all residential viewers within 0.5 mile of the AMSP/Lockhart Substation site (foreground) may have a high level of concern related to changes occurring in landscapes in the vicinity of the AMSP and Lockhart Substation.

Visual Quality: Low. The primary focal point in this landscape is the driveway leading to a single-family residence and scattered outbuildings. A secondary focal point is Lynx Cat Mountain on the horizon in the center of the view. There are no distinctive or interesting landform features in this view, leading to an overall low visual quality for the AMSP/Lockhart Substation site.

Overall Visual Sensitivity: Moderate. For residents traveling on Edie Road or living in the three rural residences in this vicinity and looking toward the proposed AMSP/Lockhart Substation site, and from KOP-4 specifically, the moderate viewer exposure, high viewer concern, and low visual quality lead to a moderate overall visual sensitivity of the visual setting and viewing characteristics.

<u>KOP-5 – Lockhart Ranch Road East of Edie Road</u>

KOP-5 is located on Lockhart Ranch Road east of Edie Road, just north of an existing rural residence, looking east along the dirt road (Figure 3.2-9). The landscape is predominantly flat with native desert vegetation of creosote bush scrub, sagebrush, and grasses. The only vertical lines are those created by the wooden distribution poles carrying electric and telephone lines that create a pattern of lines along the south side of the road. The dominant focal point in this landscape is the road itself, reinforced by the repetitive pattern of wooden utility poles on the right side of the road, leading the viewers' eyes to the flat horizon.

Viewer Exposure: Moderate-to-high. Due to the lack of landscape screening by landforms or vegetation, the AMSP/Lockhart Substation site is very visible from KOP-5. The AMSP and Lockhart Substation would contain vertical and horizontal elements that would be highly visible in the foreground from KOP-5. Recreational travelers use Lockhart Ranch Road to access Harper Dry Lake and the BLM watchable wildlife area. For the residents at this rural residence on Lockhart Ranch Road, the duration of view would be extended, but for travelers on Lockhart Ranch Road, duration of view would be brief. The number of viewers in this area is low. The high visibility, foreground distance zone, relatively low number of viewers, and extended duration of view for the residence lead to a moderate-to-high viewer exposure rating.

Viewer Concern: High. People traveling on Lockhart Ranch Road may have a moderate-to-high viewer concern. People living in this rural residence can be expected to have high concern for changes in their personal views of the adjoining landscape. Due to the difficulty in inventorying for every individual's sensitivity level, it was determined that all residential viewers within 0.5 mile of the AMSP and Lockhart Substation may have a high level of concern related to changes occurring in landscapes in the vicinity of the AMSP/Lockhart Substation site.

Figure 3.2-9: KOP-5 Existing Conditions at Lockhart Ranch Road East of Edie Road

Visual Quality: Low. The primary focal point in this landscape is Lockhart Ranch Road, which creates a strong linear feature leading into the distance. The pattern of vertical wooden poles carrying overhead utility lines reinforces this linear focal point. A secondary focal point is the abandoned rural residence and windbreak in the middleground at the center of this view. There are no distinctive or interesting landform features, vegetative patterns, water features, or cultural features in this view, leading to an overall low visual quality for the AMSP/Lockhart Substation site.

Overall Visual Sensitivity: Moderate. For residents living on Lockhart Ranch Road and for recreationists traveling on Lockhart Ranch Road looking toward the proposed AMSP/Lockhart Substation site, and from KOP-5 specifically, the moderate-to-high viewer exposure, high viewer concern, and low visual quality lead to a moderate overall visual sensitivity of the visual setting and viewing characteristics.

KOP-6 – BLM Watchable Wildlife Area

KOP-6 is located at the BLM watchable wildlife area near the east end of Lockhart Ranch Road and on the south shore of Harper Dry Lake, looking south (Figure 3.2-10). This is the view from the gravel path and visitor information signage area. Vegetation in the foreground consists of native sagebrush and low-growing grasses. Wooden poles of the local electric and telephone distribution line form strong vertical lines in this horizontal landscape. In the distance and on the horizon, lattice steel towers of the existing 220-kV and 500-kV transmission lines are visible, creating minor focal points. The proposed AMSP/Lockhart Substation site consists of fallow agricultural land with a pivot wheel irrigation system, which creates a circular pattern when viewed from the air but is indistinguishable from ground views.

Viewer Exposure: Moderate-to-high. The AMSP and Lockhart Substation are highly visible, being less than 0.25 mile south of KOP-6. However, visitors at the wildlife viewing area would most likely look to the northeast, toward Harper Dry Lake, to see wild birds during rest stops on their migratory flights. Therefore, viewers' attention would not normally be focused to the south, toward the AMSP/Lockhart Substation site. Due to the lack of landscape screening by landforms or vegetation, the proposed solar plant and substation would be highly visible from KOP-6. The number of viewers at the BLM watchable wildlife area is low, but for these viewers, the duration of view would be extended because of the pedestrian mode of travel, resulting in a moderate-to-high viewer exposure.

Viewer Concern: High. People visiting the BLM watchable wildlife area are expected to have high concern for the environment and visual quality, as they are at this area to enjoy nature and watch wildlife.

Visual Quality: Low. The primary focal points in this landscape are the covered bulletin board and the vault toilet behind the parked car. The strong horizontal line of the flat desert plain landform is interrupted only by scattered wooden poles and distant lattice steel towers of the

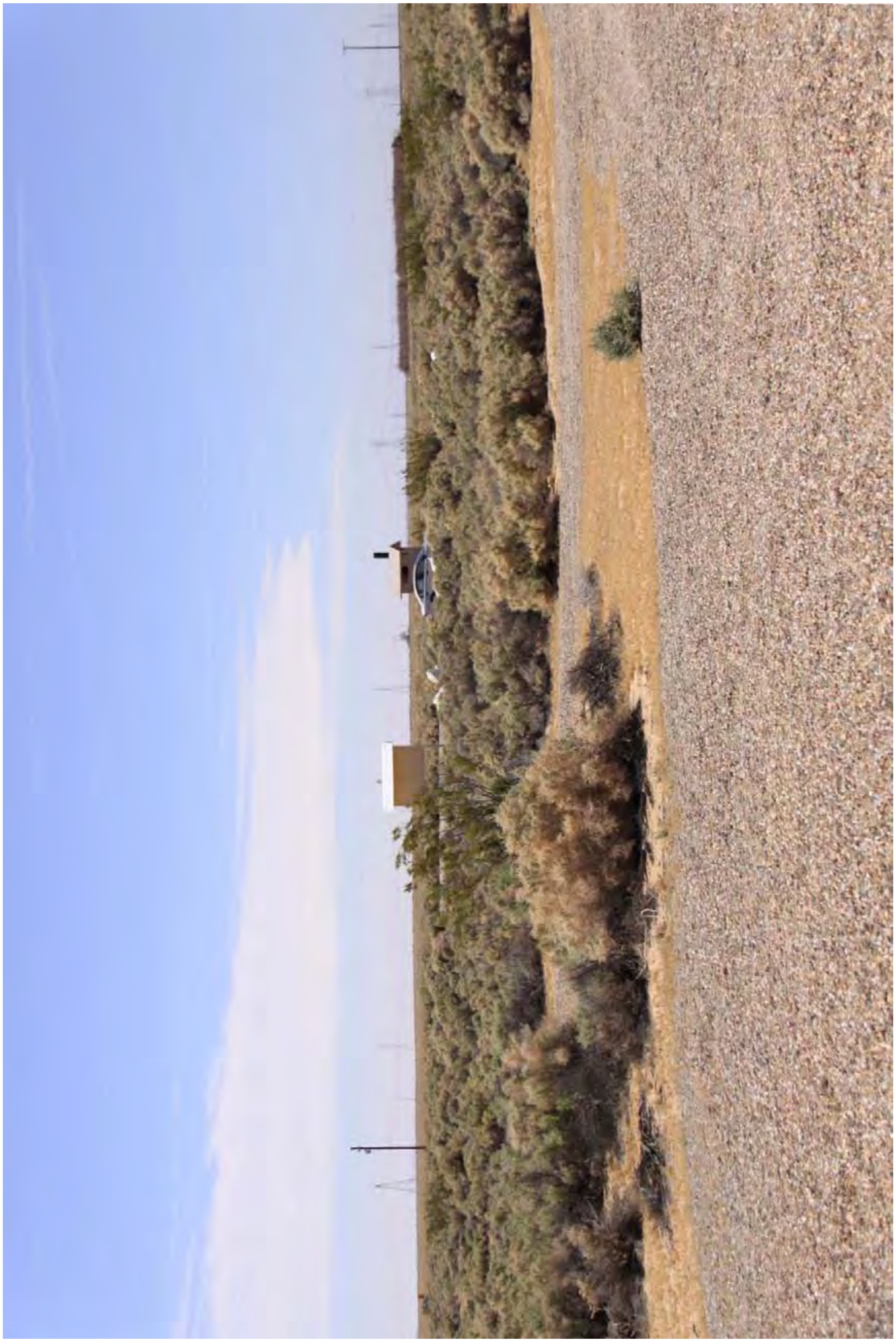


Figure 3.2-10: KOP-6 Existing Conditions at BLM Watchable Wildlife Area

existing transmission lines. There are no distinctive or interesting landform features, vegetative patterns, water features, or cultural features in this view, leading to an overall low visual quality for the AMSP/Lockhart Substation site.

Overall Visual Sensitivity: Moderate. For visitors to the BLM watchable wildlife area at the east end of Lockhart Ranch Road and for people looking at the proposed AMSP/Lockhart Substation site from KOP-6, the moderate-to-high viewer exposure, high viewer concern, and low visual quality lead to a moderate overall visual sensitivity of the visual setting and viewing characteristics.

KOP-7 – BLM Watchable Wildlife Area

KOP-7 is also located at the BLM watchable wildlife area, but the view is looking west away from Harper Dry Lake (Figure 3.2-11). The primary focal point in this landscape is the flat desert plain of the landform, which is reinforced by the dark green evergreen windbreaks that form strong horizontal lines on this tan, grass-covered landscape.

Viewer Exposure: Moderate. The proposed AMSP and Lockhart Substation would be highly visible to the west of KOP-7, on private land but visible from the BLM watchable wildlife area. The AMSP/Lockhart Substation site would extend from approximately 0.50 mile to 3 miles to the west, making this a middleground viewing distance. Visitors to this site are probably looking to the northeast, toward Harper Dry Lake, to see migratory waterfowl.

Viewer Concern: High. As described for KOP-6, people visiting the BLM watchable wildlife area are expected to have high concern for the environment and visual quality, and viewer concern for landscape quality can be presumed to be high for KOP-6 and KOP-7.

Visual Quality: Low. The primary focal point in this landscape is the flat desert plain and two evergreen windbreaks that accentuate the horizon. There are no distinctive or interesting landform features, vegetative patterns, water features, or cultural features in this view.

Overall Visual Sensitivity: Moderate. For visitors to the BLM watchable wildlife area at the east end of Lockhart Ranch Road and for people looking at the AMSP/Lockhart Substation site from KOP-7, the moderate viewer exposure, high viewer concern, and low visual quality lead to a moderate overall visual sensitivity of the visual setting and viewing characteristics.

KOP-8 – Fossil Bed Road near Black Canyon Road

KOP-8 is located on Fossil Bed Road near Black Canyon Road, looking southwest toward the proposed AMSP/Lockhart Substation site (Figure 3.2-12). The primary focal point of this landscape is the flat desert plain of the Mojave Desert, covered by scattered creosote bush scrub and grasses. This is the archetypical desert landscape.

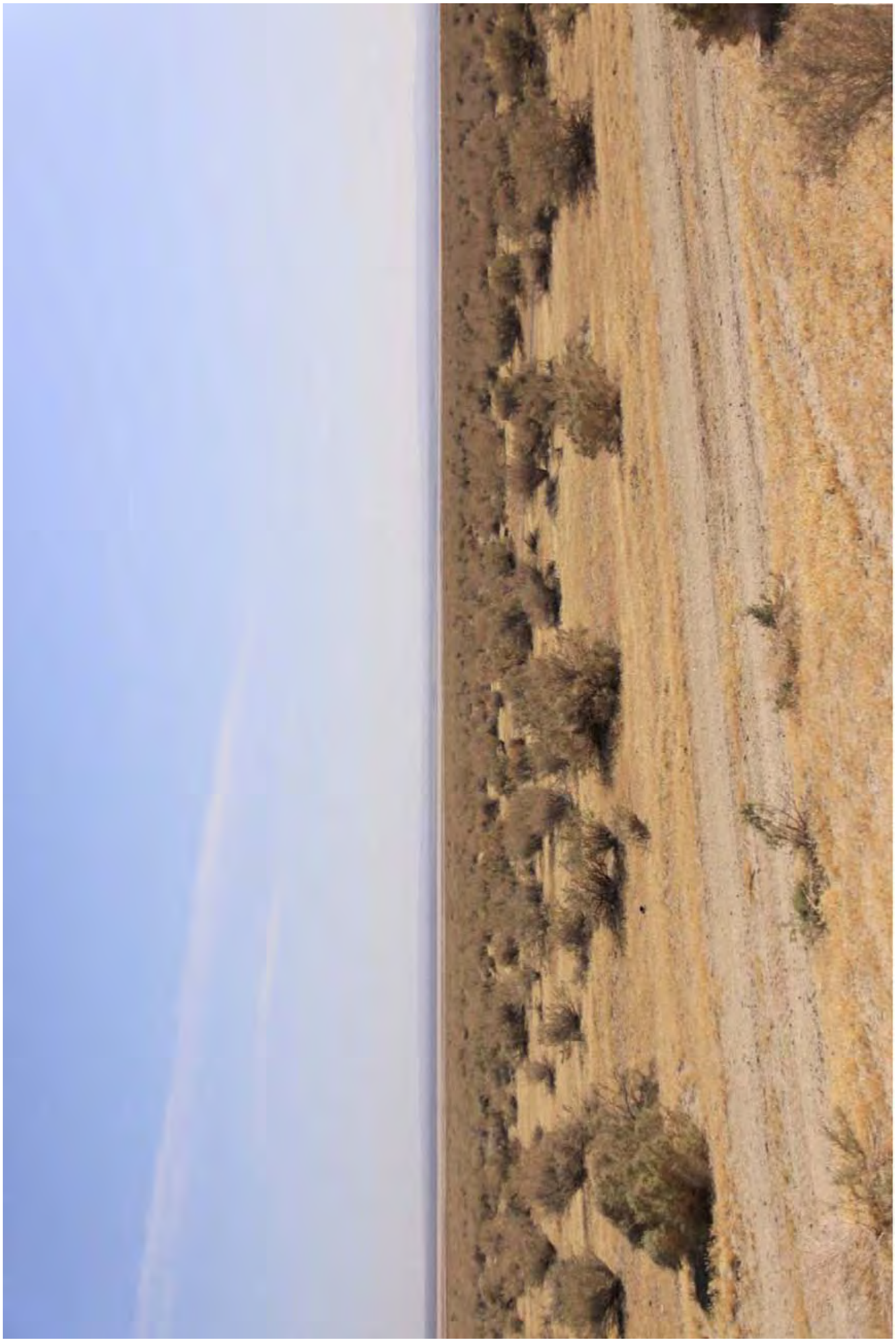


Figure 3.2-11: KOP-7 Existing Conditions at BLM Watchable Wildlife Area

Figure 3.2-12: KOP-8 Existing Conditions at Fossil Bed Road Near Black Canyon Road

Viewer Exposure: Low. Due to the lack of landscape screening by landforms or vegetation, the AMSP/Lockhart Substation site is physically visible, but because of the flat topography and angle of view, visibility of the site is moderate-to-low. The AMSP and Lockhart Substation would be barely visible in the background from KOP-8. The flat viewing angle, background distance zone, relatively low number of viewers, and brief duration of view lead to a low viewer exposure rating.

Viewer Concern: Low. People traveling on these desert roads can be expected to have low concern for changes in the background landscape, 5 to 8 miles away. For this visual analysis, it was determined that viewers at KOP-8 would have a low level of concern related to changes occurring in the background landscapes of the AMSP/Lockhart Substation site.

Visual Quality: Low. There is no primary focal point in this landscape, and the flat horizontal land plain is devoid of distinguishing characteristics. There are no distinctive or interesting landform features, vegetative patterns, water features, or cultural features in this view, leading to an overall low visual quality for the AMSP/Lockhart Substation site.

Overall Visual Sensitivity: Low. For people driving on Fossil Bed Road near Black Canyon Road and looking at the proposed AMSP/Lockhart Substation site 5 to 8 miles away, and from KOP-8 specifically, the low viewer exposure, low viewer concern, and low visual quality lead to a low overall visual sensitivity of the visual setting and viewing characteristics.

3.2.2.2 Telecommunication System

The following visual setting is organized by the three new fiber-optic routes.

Lockhart to Tortilla Substation

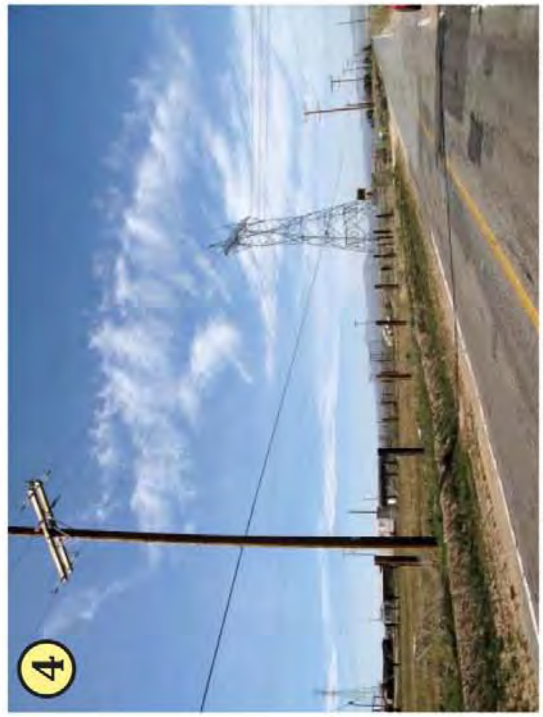
The existing poles and overhead fiber-optic line are proposed within existing electric transmission line corridors that parallel a dirt road between Lockhart Substation and Harper Lake Road. As shown in Photos 2 and 3 (Figure 3.2-13), two 220-kV transmission lines with steel lattice towers parallel the road on either side and a 33-kV transmission line with wood H-frame poles lines the road to the north. The transmission lines are the predominant visual reference point along this portion of the route. This route is bound mostly by open space and limited agriculture to the north and south.

As the route heads south along Harper Lake Road, the proposed fiber-optic cable would be strung on existing transmission line poles primarily on the west side of the road, with the exception of where 400 feet of underground conduit would be required where the route turns south on Harper Lake Road. The trenching would occur on the east side of the road, described as a disturbed road shoulder. Refer to Photos 4 and 5 in Figures 3.2-13 and 3.2-14. Refer to Photo 6 in Figure 3.2-14 for a view of the existing overhead lines along Harper Lake Road.

Looking north to Lockhart Substation site.

Looking west from Lockhart Substation where new overhead poles are proposed.

Looking east toward Lockhart Substation within corridor where new poles are proposed.

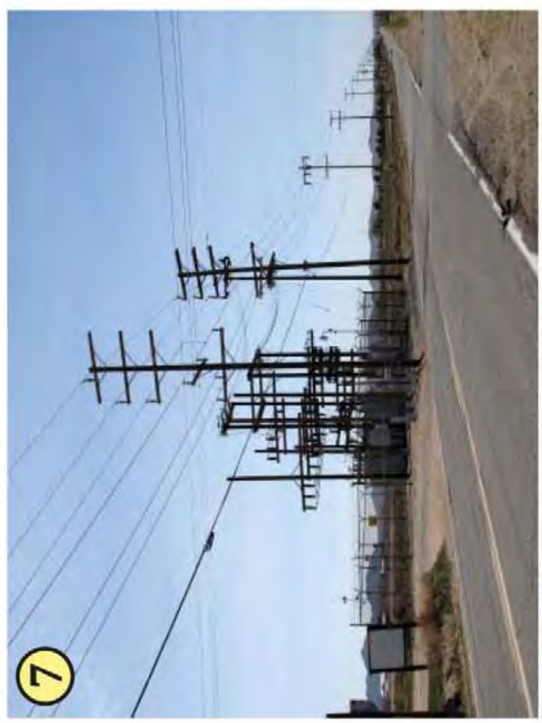


Looking north on Harper Lake Road where underground trenching is proposed.

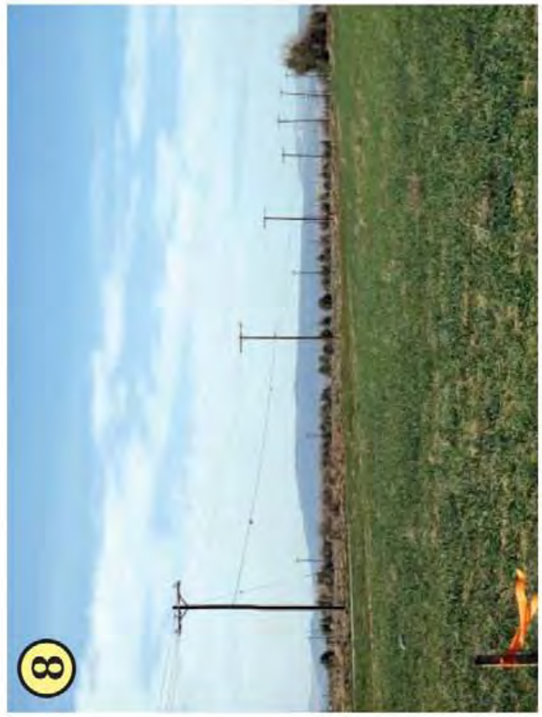
Figure 3.2-13: Study Area Photos 1–4

Looking north on Harper Lake Road where underground trenching is proposed in road shoulder.

Looking north on Harper Lake Road at existing poles.



Looking southwest at corner of SR 58 and Harper Lake Road at Hinkley Substation.



Existing overhead poles along Summerset Road, looking north.

Figure 3.2-14: Study Area Photos 5–8

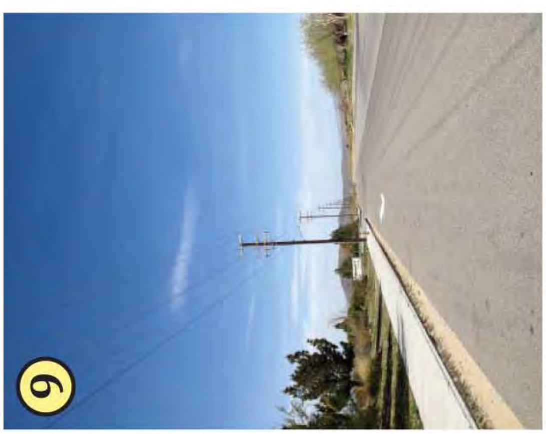
The Hinkley Substation is the primary visual focus since it is the only structure in the vicinity and is surrounded by open space. Refer to Photo 7 in Figure 3.2-14. The proposed fiber-optic line would be strung on existing transmission line poles paralleling SR-58, a similar view to that along Harper Lake Road. Most of this route can be described as flat terrain, abutted on both sides of road by open space, agriculture, and rural residential uses toward the east end of this segment. The existing poles along Summerset Road (Photo 8, Figure 3.2-14), Community Road, and Lenwood Road (Photo 9, Figure 3.2-15) traverse through similar, flat terrain, with the addition of more rural residential uses on either side of the roads.

As the existing overhead line crosses south of Main Street along Sun Valley Drive and then northeast, the visual setting consists of more mixed land uses, including commercial, residential, and light industrial land uses, followed by medium-density residential land uses along I Street and Siderite Road, until the existing overhead line, the 115-kV Kramer–Tortilla transmission line, traverses through an open space field in a southeast direction to the Tortilla Substation. Refer to Photos 10 and 11 in Figure 3.2-15 for the Tortilla Substation and existing poles proposed to be used to route the new fiber-optic cable. No significant visual resources exist along the Lockhart to Tortilla Substation fiber-optic line.

Approximately 3.6 miles (nearly 12%) of the total 31 miles of the Lockhart-Tortilla transmission line corridor is on public lands managed by the BLM. The visual setting is characterized by expansive views of open space on flat, desert terrain that encompasses both BLM and private land; the analysis of the entire route, including areas of private lands, was addressed above. The characteristic rural development described for private lands is generally within the viewshed of adjacent parcels of BLM lands due to the intermingled BLM and private land ownership along the existing transmission line corridor. BLM lands crossed by, or adjacent to, the corridor are located along Harper Lake Road, SR-58, and a small segment of Lenwood Road. Refer to Figure 2-11 to see where the proposed route crosses or abuts BLM-managed lands. The existing overhead transmission line on BLM land is visible in the immediate foreground distance zone (up to 0.5 mile from viewpoint), as viewed from these roads.

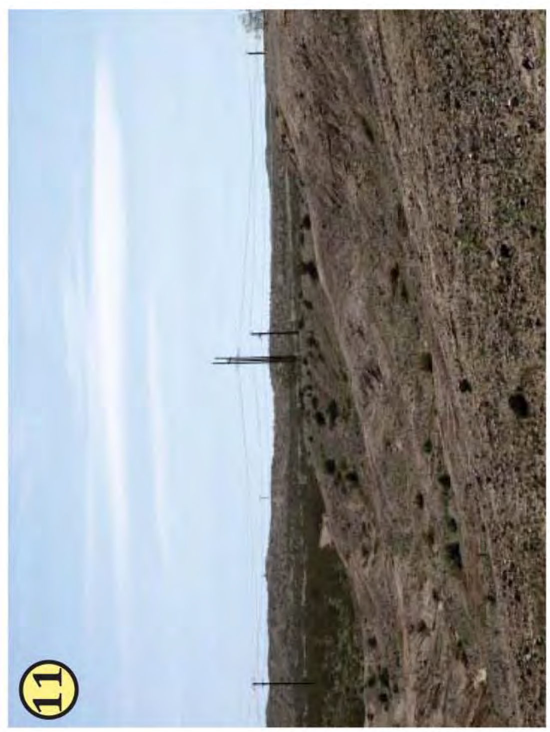
Lockhart to Kramer Substation

New poles for overhead fiber-optic cable are proposed within the AMSP to link the Lockhart Substation with the Kramer Substation. The new poles would be located within the AMSP, between the substation and Lockhart Road to the north. The route continues west along Lockhart Road, where cable is proposed to be strung on existing transmission poles. The setting consists of fairly level terrain that was historically used for agriculture, marked only by dirt roads crossing the site. The cable would be strung on existing poles along Harper Lake Road, with the exception of where three replacement poles are required. The visual setting along this segment of the route is described as a rural country road surrounded by open space, agriculture, and scattered residences. The cable is proposed to be strung along existing poles between Harper Lake Road and just west of U.S. Highway 395, and this segment of the fiber-optic cable route is described visually as vast desert open space marked only by the existing

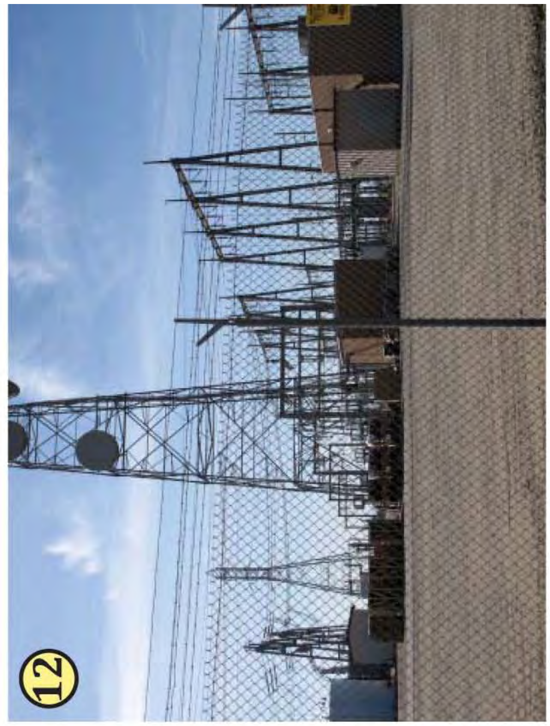


Looking north on Lenwood Road, existing poles.

Looking south toward Tortilla Substation.



Looking southwest at existing Kramer - Tortilla 115 kV line.



View of Kramer Substation.

Figure 3.2-15: Study Area Photos 9–12

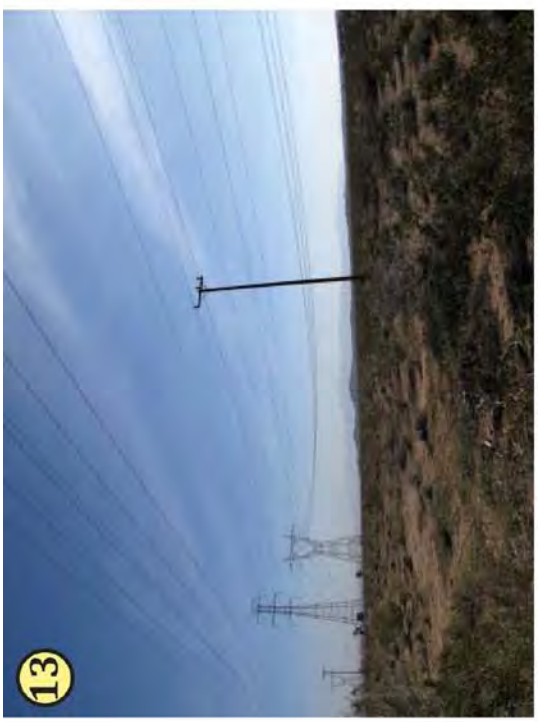
transmission structures and line, and dirt roads crisscrossing the corridor. The existing overhead transmission line is not the dominant visual feature near this intersection. The cable would continue south connecting with the Kramer Substation, a large facility, depicted in Photo 12, Figure 3.2-15. No significant visual resources exist along the Lockhart to Kramer Substation fiber-optic line.

Approximately 5.1 miles (31%) of the total 16.4 miles of the Lockhart–Kramer transmission line corridor is on public lands managed by BLM. The corridor contains a mix of BLM and private lands east of U.S. Highway 395, to just west of Harper Lake Road. The visual setting is characterized by expansive views of open space on flat desert terrain, as well as the existing overhead transmission lines in the corridor. The transmission line on BLM lands is more than 1 mile from viewpoints on U.S. Highway 395, and a minimum of 0.5 mile north of SR-58, which parallels a portion of the transmission line. Views of BLM lands from the highways also encompass private lands and are characterized by the desert open space and existing development as described above for private lands. The existing transmission structures on BLM lands are not a dominant element as seen from the highways, as structures on private land are closer to the highways and are a dominant element in the immediate foreground of highway viewpoints.

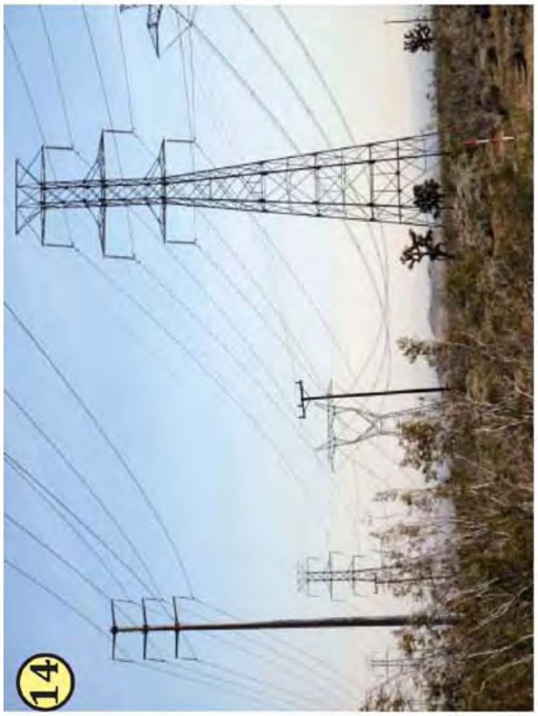
Kramer to Victor Substation

The Kramer Substation is a dominant feature at the crossroads of SR-58 and U.S. Highway 395; however, this industrial land use is located near an intersection with a number of retail and commercial land uses that are strategically located to provide services to motorists passing through the Mojave Desert. The substation is not considered a visual distraction given the nature of this intersection. The proposed fiber-optic cable between the Kramer and Victor substations would follow within the ROWs of three existing transmission line corridors that parallel the west side of U.S. Highway 395. These three existing transmission lines are prominent in the view of motorists driving along this stretch of the highway. Refer to Photos 13 and 14 in Figure 3.2-16 for a depiction of the three existing transmission corridors and associated structures and line. The existing structures include large steel lattice towers for two of the transmission lines and single wood poles for the third transmission line. The existing visual setting between the Kramer Substation and three-quarters of this alignment south consists of undeveloped open space with varying topography, but mostly gently rolling slopes and knolls. The terrain to the east is relatively flat, with fairly long-distance views easterly across the desert. At approximately 5.4 miles south of the Kramer Substation, the three existing corridors trend westerly to route around one of the higher knolls of Kramer Hills. The transmission towers and lines are not visible from U.S. Highway 395 for approximately 1 mile.

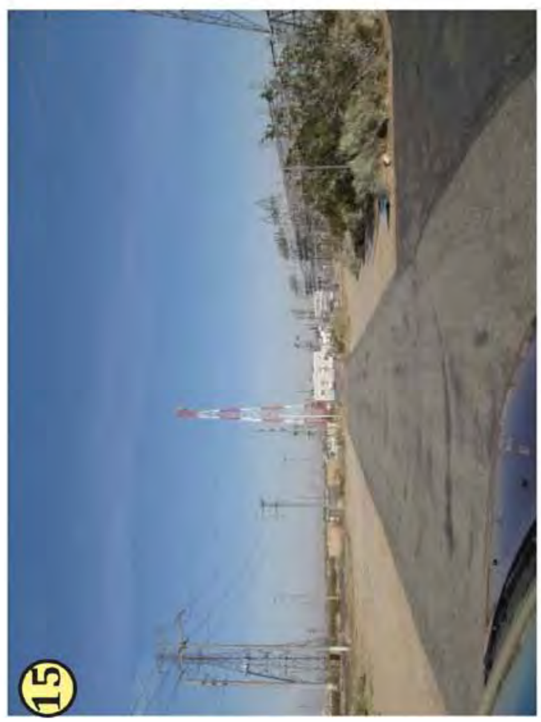
As the corridor nears the community of Adelanto, retail, commercial, light industrial, and residential land uses become more evident along both sides of the highway. The proposed fiber-optic line continues parallel to U.S. Highway 395 on the west side, routing in and out of the Roadway Substation. Once the alignment crosses U.S. Highway 395, the existing utility



Looking southwest along Highway 395 at existing transmission line corridors.



Looking southwest along Highway 395 of existing transmission line corridors.



View east toward Victor Substation and existing transmission lines to the north.

View of Victor Substation.

Figure 3.2-16: Study Area Photos 13–16

corridor mostly crosses an open space and desert setting. The existing overhead poles and line for this southern portion of the alignment are not prominent visual features and tend to blend into the urban setting, and the segment that crosses the open space is obscured from motorists on U.S. Highway 395 by existing retail and commercial uses.

The Victor Substation, a large substation similar to the Kramer Substation, is set easterly away from U.S. Highway 395 but still within a fairly urban setting between the retail and commercial uses along the highway and residential communities to the east. The substation is a prominent visual feature along this stretch of Palmdale Road (Highway 18). Refer to Photo 16 in Figure 3.2-16 for a depiction of the Victor Substation.

Approximately 8.5 miles (22%) of the total 38 miles of the existing Kramer-Victor transmission line corridor crosses public lands managed by BLM. The corridor contains BLM lands intermingled with private and other Federal lands along U.S. Highway 395. The visual setting is characterized by expansive views of open space on flat desert terrain, punctuated with low hills and ridges in the Kramer Hills portion of this alignment. The dominant visual feature on both BLM and adjacent military and private lands is the existing overhead transmission lines that are visible in the immediate foreground distance zone (up to 0.5 mile from viewpoint) as viewed from the highway. As noted above and shown in Figure 3.2-16, multiple, parallel transmission line corridors follow the U.S. Highway 395 corridor.

3.2.3 Environmental Consequences

3.2.3.1 Proposed Action

3.2.3.1.1 AMSP and Lockhart Substation

The AMSP and Lockhart Substation are located in a rural and former agricultural area. The solar field would surround each power island, which would be centered in the middle of each solar field. Project components that may affect visual resources include the following:

- The solar troughs would reflect light and take on the color of what is reflected back to the viewer. If the reflected image is the sky, mirrors appear blue, white, or gray, depending on sky color. If the mirrors are aimed toward the horizon, the reflected image is of the soil color, which is tan to gray.
- The power block buildings are prefabricated buildings whose walls would be a warm pallet of light tan colors sympathetic to the desert context.
- The solar collector assembly buildings would be composed of large, rectangular, prefabricated metal buildings with shallow gable and/or shallow shed roofs. Walls would be a warm pallet of light tan colors sympathetic to the desert context.

- All-weather, paved access roads would be provided to both power islands for emergency and fire access. Only a small portion of the overall plant site would be paved with asphalt, primarily the site access road and portions of the power block.
- Fencing would be galvanized gray chain-link fence, 6 to 8 feet tall.
- The gen-tie line poles are approximately 80 feet in height (maximum pole height of 110 feet), with a span length expected to average approximately 500 feet.
- The interconnection substation would be located on the AMSP/Lockhart Substation site in the southwest corner of the Beta site. The interconnection would extend from the substation to a point under the adjacent power lines in the transmission ROW.
- Lighting would be designed to provide the minimum illumination needed to achieve safety and security objectives and would be shielded and oriented to focus illumination on the desired areas and minimize additional nighttime illumination in the site vicinity.
- Cooling towers at the AMSP power islands would be similar to the cooling towers at the existing SEGS VIII and IX power islands. The air leaving the cooling towers is usually saturated with moisture and warmer than the ambient air, causing potential formation of a visual plume. The saturated exhaust plume may be visible depending on the specific meteorological conditions.

Visual effects resulting from the development of the AMSP and Lockhart Substation would include changes to the visual character of the landscape by introducing new elements into the landscape that would alter the form, line, color, and texture that characterize the existing landscape.

The existing open space landscape character of fallow agricultural lands at the AMSP/Lockhart Substation site would be modified into a commercial-scale solar-generating power plant, altering the existing landscape character of the AMSP site as seen from the surrounding vicinity. However, this alteration would not substantially degrade the existing visual character or quality of the site and its surroundings.

The elements that extend beyond the AMSP boundary connect to a large east-west utility corridor that contains large lattice towers, wooden utility poles, and overhead transmission lines. The proposed AMSP facilities are consistent with the adjacent solar power-generating facility to the northwest. The Lockhart Substation structure would not exceed the heights of proposed AMSP facilities and the station and interconnection elements are not located in an area considered to have sensitive visual features (refer to the KOP analysis below). The connection to the existing 220-kV transmission line would not result in a substantive visual alteration since existing towers would be replaced with similar structures and transmission lines would be consistent with the visual setting of the large east-west transmission corridor.

The existing SEGS VIII and IX are situated just northwest of the proposed AMSP/Lockhart Substation site, north of and along Hoffman Road. SEGS VIII and IX utilize similar technology and hardware to what would be utilized at the AMSP. Existing nighttime lighting levels and existing water vapor plumes at the existing SEGS VIII and IX solar plants are similar to what would be expected from future nighttime lighting and water vapor plumes at the proposed AMSP.

Project elements possess the potential to alter the existing visual character or quality of the AMSP/Lockhart Substation site. Due to the size of the AMSP/Lockhart Substation site (1,765 acres) and configuration of the solar troughs and power islands, these various project elements would be clearly evident and would alter the landscape from the KOPs identified in this analysis. Direct visual impacts associated with the AMSP and Lockhart Substation would be changes from the current open views of fallow agricultural fields to views of a commercial-scale solar farm as seen from the KOPs. These visual impacts would not be considered substantively adverse. While the existing visual character and quality of the site and its surroundings would be altered to accommodate the construction and operation of the AMSP/Lockhart Substation, these facilities would be visually compatible with the adjacent SEGS and would not adversely impact an existing visual resource. There are no identified indirect impacts to visual resources on the site with operation of the AMSP and Lockhart Substation.

The AMSP/Lockhart Substation site would have direct, but not adverse effects on views toward the AMSP site, as described below for the KOPs analysis.

Key Observation Point Analysis

<u>KOP-1 – Harper Lake Road near Phoenix Road</u>

From this vantage point, the AMSP and Lockhart Substation would be physically visible; however, because of the flat terrain, intervening undulations in the landforms of the flat desert plain, and the nearly flat viewing angle, the solar plant would be barely visible (Figure 3.2-17).

Visual Contrast: Low. The AMSP and Lockhart Substation would blend in with the flat terrain of the existing agricultural fields from this distance (middleground). Both the Alpha and Beta solar troughs would be visible at a very flat angle of view.

Project Dominance: Low. Because the AMSP and Lockhart Substation would be seen at middleground distances from KOP-1 on Harper Lake Road, and because the existing site is flat and only the Alpha power island would be visible in this view, the AMSP/Lockhart Substation site would not dominate this view.

View Impairment: Low. As seen from KOP-1, the AMSP and Lockhart Substation would fit into the landscape and would not impair any views to the surrounding or backdrop landscape. The solar plant would create no view impairment of the skyline or surrounding landscape scenery, leading to a low rating of view impairment.

Figure 3.2-17: KOP-1 Harper Lake Road Near Phoenix Road (Post-Project)

Overall Visual Change: Low. Based on low visual contrast, low project dominance, and low view impairment, the overall visual change at KOP-1 would be low.

Visual Sensitivity/Visual Change: No adverse effect. The overall visual change seen from KOP-1 at Harper Lake Road would be low. In the context of the existing landscape's low visual sensitivity, the resulting visual impact is not adverse.

KOP-2 – Harper Lake Road South of Roy Road

Solar troughs of the Alpha plant would be visible on both west and east sides of the road, but would be located on flat terraces that limit their visual magnitude. The solar plant site is approximately 0.75 mile from KOP-2, making this a middleground viewing distance (Figure 3.2-18).

Visual Contrast: Low. As seen from KOP-2, the AMSP and Lockhart Substation would blend in with the flat terrain of the existing agricultural fields from this viewing distance (middleground). Only the Alpha solar troughs would be visible from KOP-2, but at a very flat angle of view, thereby reducing the visual contrast.

Project Dominance: Low. The proposed solar plant would be seen at middleground distances from KOP-2 on Harper Lake Road. The existing site is flat and the Alpha power island would be visible but would replace an existing agricultural building in this view Therefore, the AMSP/Lockhart Substation site would not dominate this view.

View Impairment: Low. As seen from KOP-2, the AMSP and Lockhart Substation would fit into the landscape and would not impair any views to the surrounding or backdrop landscape. The Alpha power island would not block or impair views to any unique landscape element in the background, leading to a low rating of view impairment.

Overall Visual Change: Low. Based on low visual contrast, low project dominance, and low view impairment, the overall visual change at KOP-2 would be low.

Visual Sensitivity/Visual Change: No adverse effect. The overall visual change seen from KOP-2 at Harper Lake Road would be low and in the context of the existing landscape's low visual sensitivity, the resulting visual impact is not adverse.

KOP-3 – Roy Road, East of Edie Road

Solar troughs would be visible in the foreground and middleground viewing distances from KOP-3, and the perimeter chain-link fence would be visible. (Figure 3.2-19). A drainage channel would be constructed inside the chain-link fence but, because of its depth and distance away from the viewer, would not be visible from KOP-3.

Figure 3.2-18: KOP-2 Harper Lake Road South of Roy Road (Post-Project)

Figure 3.2-19: KOP-3 Roy Road East of Edie Road (Post-Project)

Visual Contrast: High. As seen from KOP-3 on Roy Road, the AMSP and Lockhart Substation would be visible in the foreground and middleground as seen from this vantage point and from the nearby rural residences. Because there is no topographic or vegetative screening for the AMSP/Lockhart Substation site, visual contrast would be high.

Project Dominance: High. The AMSP and Lockhart Substation would be very visible from KOP-3 and the nearby rural residences and would create a new focal point in the landscape. The AMSP/Lockhart Substation site would have high visual dominance as seen from KOP-3.

View Impairment: Low-to-moderate. Due to the horizontal nature of the AMSP's solar troughs, the distance from KOP-3 to the Beta power island, and the fact that the power island does not extend above the skyline in the background, as illustrated in the simulation of KOP-3, view impairment to surrounding landscape features would be low-to-moderate.

Overall Visual Change: Moderate-to-high. Based on high visual contrast, high project dominance, and low-to-moderate view impairment, the overall visual change at KOP-3 on Roy Road would be moderate-to-high.

Visual Sensitivity/Visual Change: No adverse effect with Project design features incorporated. The overall visual change seen from KOP-3 and in this vicinity of rural residences would be moderate-to-high and in the context of the existing landscape's moderate visual sensitivity, the resulting visual impact would not be adverse with project design features incorporated. Specific project design features that minimize visual impacts include the following elements:

- Design Feature 1: The surfaces of all aboveground structures except the solar collectors (i.e., control building, administration building, warehouse, water treatment building, solar collector array assembly buildings, enclosures for mechanical and electrical equipment, substation MERS building, water storage tanks, etc.) would be given low reflectivity finishes with neutral desert tan colors sympathetic to the desert environment to minimize the contrast of the structures with their backdrops.
- Design Feature 2: All substation equipment would be specified with low reflectivity, neutral finishes. All insulators at the substations and on the takeoff equipment would be nonreflective and nonrefractive. The chain-link fences surrounding the substation and AMSP site would have a dulled finish to reduce contrast with the desert surroundings.
- Design Feature 3: For overhead transmission lines, tubular steel poles would be painted light-gray colors or would be dulled galvanized steel. If concrete monopoles are used, they would be natural concrete with light-gray colors. All insulators specified for this Project would be made of materials that do not reflect or refract light. All conductors specified for the AMSP/Lockhart Substation site would be nonspecular; that is, they would be treated at the factory to dull their surfaces to reduce their potential to reflect light.

- Design Feature 4: All construction-related operations at the construction laydown area would be kept clean and tidy. Mojave Solar would remove construction debris promptly at regular intervals, not to exceed 2 weeks at any one location.
- Design Feature 5: All outdoor lighting would be the minimum required to meet safety and security standards and all light fixtures would be hooded to eliminate any potential for glare effects and to prevent light from spilling off the site or up into the sky. In addition, the light fixtures would have sensors and switches to permit the lighting to be turned off at times when it is not required.
- Design Feature 6: The Applicant will voluntarily consult with residential property owners within 0.5 mile of the proposed AMSP/Lockhart site boundary to suggest offsite-planting on adjacent residential properties (if landowner is interested) to assist with visual screening of the AMSP/Lockhart site as seen from these single-family residential locations.

<u>KOP-4 – Edie Road South of Lockhart Ranch Road</u>

In the center of this view, Lynx Cat Mountain forms a minor secondary focal point on the skyline. Beyond the fence line and distribution line with wooden posts (which is the property line for the AMSP/Lockhart Substation site, about 0.25 mile away), there would be a chain-link perimeter fence and solar troughs of the Beta plant, visible in the foreground. The top of the Beta power island would be barely visible in the middleground as seen from KOP-4, mostly screened from view by the solar troughs and existing vegetation at this farmstead. Residents along Edie Road would have unobstructed views to the proposed Project features (Figure 3.2-20).

Visual Contrast: Moderate-to-high. The AMSP and Lockhart Substation would be visually evident from KOP-4, although they would be farther away from KOP-4 than from KOP-3, thereby reducing their visual magnitude. As shown in the simulation, new solar troughs would be visible in the foreground along the existing fence line and would extend into the middleground along the left (north) side of the photograph.

Project Dominance: High. The AMSP and Lockhart Substation would be very visible from KOP-4 and the nearby rural residences and would create a new focal point in the landscape. The proposed Project would have high visual dominance as seen from KOP-4.

View Impairment: Moderate-to-high. Even with the horizontal nature of the AMSP's solar troughs, the skyline at the horizon and portions of Lynx Cat Mountain would be obstructed from view as seen from KOP-4. Additionally, the Beta power island would screen part of Lynx Cat Mountain from view, as illustrated in the simulation of KOP-4.

Figure 3.2-20: KOP-4 Edie Road South of Lockhart Ranch Road (Post-Project)

Overall Visual Change: Moderate-to-high. Based on moderate-to-high visual contrast, high project dominance, and moderate-to-high view impairment, the overall visual change at KOP-4 on Edie Road would be moderate-to-high.

Visual Sensitivity/Visual Change: No adverse effect with Project design features incorporated. The overall visual change seen from KOP-4 would be moderate-to-high in the context of the existing landscape's moderate visual sensitivity. Specific project design features that minimize visual impacts include Design Measures 1 through 6 listed above for KOP-3.

<u>KOP-5 – Lockhart Ranch Road East of Edie Road</u>

Due to the lack of landscape screening by landforms or vegetation, the AMSP and Lockhart Substation would be very visible from KOP-5 (residence on Lockhart Ranch Road), and for people traveling to the BLM watchable wildlife area. The proposed Project would contain vertical and horizontal elements that would be highly visible in the foreground (Figure 3.2-21). Farther east along Lockhart Ranch Road (in the middleground of this view), solar troughs would be visible on both the left and right sides of the road.

Visual Contrast: High. The AMSP and Lockhart Substation would be very visually evident from KOP-5 and would be directly across the street from this rural residence, thereby increasing the visual magnitude of the solar plant. As shown in the simulation, a new perimeter chain-link fence, drainage channel, transmission line, and solar troughs would be very visible in the foreground along Lockhart Ranch Road and would extend into the middleground along the road.

Project Dominance: High. The AMSP and Lockhart Substation would be very visible from KOP-5 and the nearby rural residence and would attract attention and create a new focal point in the landscape. The AMSP/Lockhart Substation site would have high visual dominance as seen from KOP-5.

View Impairment: Moderate-to-high. Even with the relatively short stature of the AMSP's chain-link fence and solar troughs, the skyline at the horizon would be obstructed from view as seen from KOP-5; however, this obstruction would be less noticeable as seen from the lane of travel. The camera position shows a vantage point that would not normally be seen from either the rural residence or travelers on Lockhart Ranch Road.

Overall Visual Change: Moderate-to-high. Based on high visual contrast, high project dominance, and moderate-to-high view impairment, the overall visual change at KOP-5 on Lockhart Ranch Road would be high.

Figure 3.2-21: KOP-5 Lockhart Ranch Road East of Edie Road (Post-Project)

Visual Sensitivity/Visual Change: No adverse effect with Project design features incorporated. The overall visual change seen from KOP-5 would be high; however, in the context of the existing landscape's moderate visual sensitivity, the resulting visual impact would not be adverse with project design features incorporated. Specific design features that minimize visual impacts include Design Measures 1 through 6 listed above for KOP-3.

<u>KOP-6 – BLM Watchable Wildlife Area</u>

From the gravel path and visitor information signage area, the AMSP and Lockhart Substation, located on the south side of Lockhart Ranch Road, would be visible beyond the covered BLM bulletin board (in the center of this simulation) and the vault toilet behind the parked car (Figure 3.2-22). The view would be looking south, down the solar troughs, giving a unique view of these troughs as they articulate to follow the sun. The existing windbreak visible on the right side of this view would be replaced with the Beta power island. The lower portion of the existing lattice steel towers on the horizon would be screened from view by the solar troughs and the power island. The AMSP and Lockhart Substation would be highly visible and less than 0.25 mile south of KOP-6, making this a foreground view from the BLM watchable wildlife area. However, it should be noted that viewers' attention would not normally be focused to the south, toward the proposed solar plant site, but rather to the lake bed where wildlife gather.

Visual Contrast: Moderate-to-high. The AMSP and Lockhart Substation would be very visually evident from KOP-6 at the BLM watchable wildlife area. As shown in the simulation, the arrays of solar troughs would be very visible in the foreground across Lockhart Ranch Road and would extend into the middleground toward the existing transmission lines.

Project Dominance: High. The AMSP and Lockhart Substation would be very visible from KOP-6 and the BLM watchable wildlife area and would attract attention and create a new focal point in the landscape.

View Impairment: Low. The existing view to the south from the BLM area shows a flat desert plain extending to the horizon, punctuated by vertical lattice steel towers of two existing transmission lines. The AMSP/Lockhart Substation site would replace this view with taller, horizontal arrays of solar troughs. The skyline at the horizon would be slightly obstructed from view as seen from KOP-6, as illustrated in the simulation of KOP-6 (Figure 3.2-22).

Overall Visual Change: Moderate. Based on moderate-to-high visual contrast, high project dominance, and low view impairment, the overall visual change at KOP-6 at the BLM watchable wildlife area would be moderate.

Visual Sensitivity/Visual Change: Altered but not adverse. The overall visual change seen from KOP-6 would be moderate and in the context of the existing landscape's moderate visual sensitivity, and the fact that viewers at the BLM watchable wildlife area would most likely be looking north toward Harper Dry Lake and not south toward the AMSP/Lockhart Substation site. The resulting visual impact would be altered but is not considered adverse.

Figure 3.2-22: KOP-6 BLM Watchable Wildlife Area (Post-Project)

KOP-7 – BLM Watchable Wildlife Area

KOP-7 is also located at the BLM watchable wildlife area, but the view is looking west toward the AMSP/Lockhart Substation site and away from Harper Dry Lake and any migratory wildfowl (Figure 3.2-23). The existing dark green evergreen windbreaks would be replaced with solar troughs, and on the far right side of this view, two solar collector assembly buildings would be visible. The Alpha power island would be visible in the center of this view, but it would be located approximately 2 miles away, in the middleground.

Visual Contrast: Moderate-to-high. The AMSP and Lockhart Substation would be very visually evident from KOP-7. As shown in the simulation (Figure 3.2-23), the arrays of solar troughs would be less visible looking west than they are when looking south, as shown for KOP-6.

Project Dominance: Moderate. The AMSP and Lockhart Substation would be visible from KOP-7 and the BLM watchable wildlife area and would attract attention and create new focal points in the landscape, but because of the distance to the AMSP/Lockhart Substation site, it would have moderate visual dominance.

View Impairment: Low. The existing westerly view from KOP-7 shows a flat desert plain extending to the horizon, punctuated only by existing windbreaks. The AMSP and Lockhart Substation would replace these windbreaks with horizontal arrays of solar troughs. The skyline at the horizon would be slightly obstructed from view by the Alpha power island and solar collector assembly buildings, as illustrated in the simulation of KOP-7 (Figure 3.2-23).

Overall Visual Change: Moderate. Based on moderate-to-high visual contrast, moderate project dominance, and low view impairment, the overall visual change from KOP-7 would be moderate.

Visual Sensitivity/Visual Change: Altered but not adverse. The overall visual change seen from KOP-7 would be moderate and, in the context of the existing landscape's moderate visual sensitivity, the resulting visual impact would be altered but not adverse.

KOP-8 – Fossil Bed Road near Black Canyon Road

KOP-8 is located on Fossil Bed Road near Black Canyon Road, looking southwest toward the AMSP/Lockhart Substation site (Figure 3.2-24). This vantage point is approximately 5.67 miles to 7.83 miles northeast of the AMSP/Lockhart Substation site, making this a background viewing distance zone. The primary focal point of this landscape is the flat desert plain of the Mojave Desert, covered by scattered creosote bush scrub and grasses. This is the archetypical desert landscape. Due to the lack of landscape screening by landforms or vegetation, the AMSP and Lockhart Substation would be physically visible. However, because of the background distances, flat topography and flat angle of view, the AMSP and Lockhart Substation would be barely visible in the background from KOP-8.

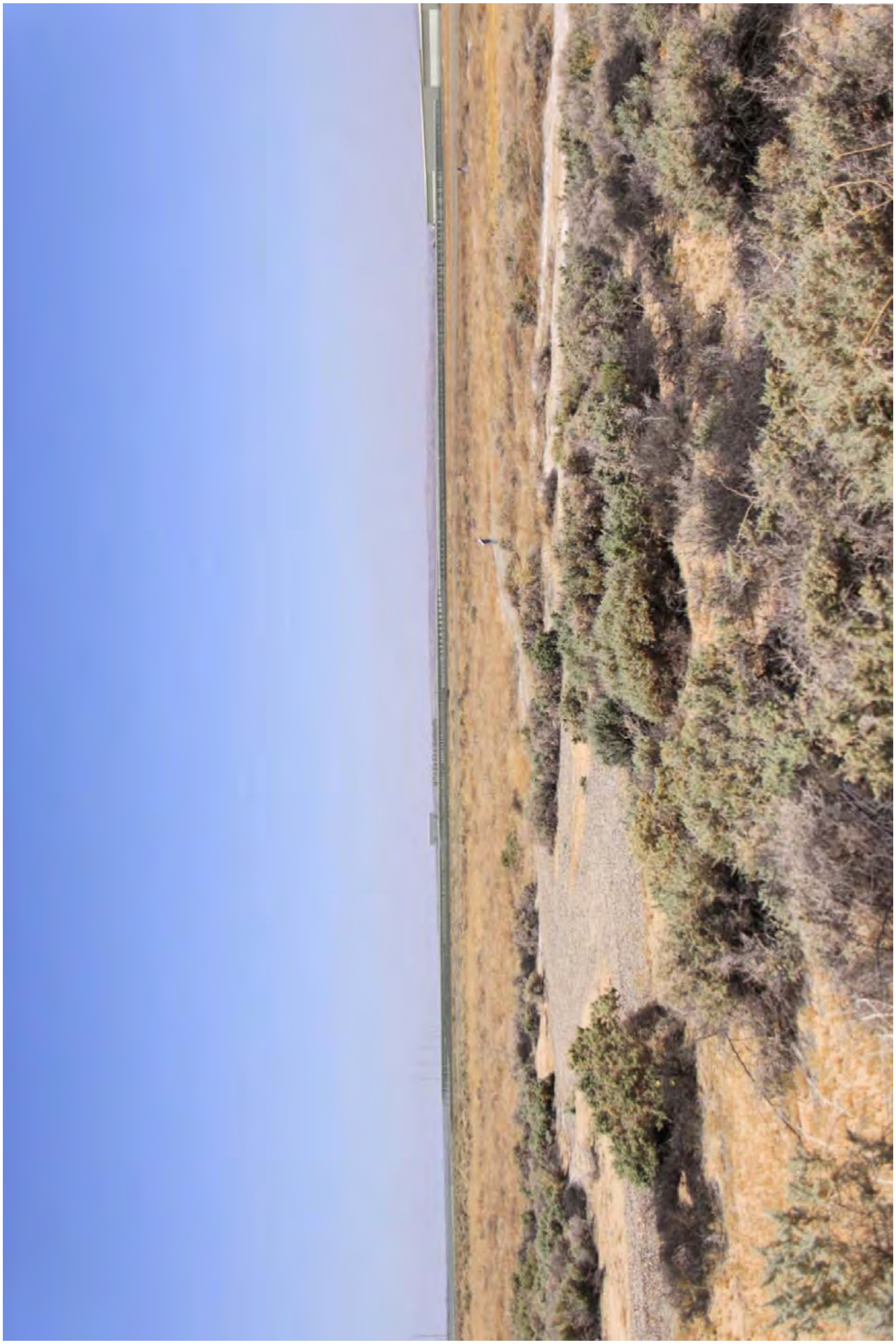


Figure 3.2-23: KOP-7 BLM Watchable Wildlife Area (Post-Project)

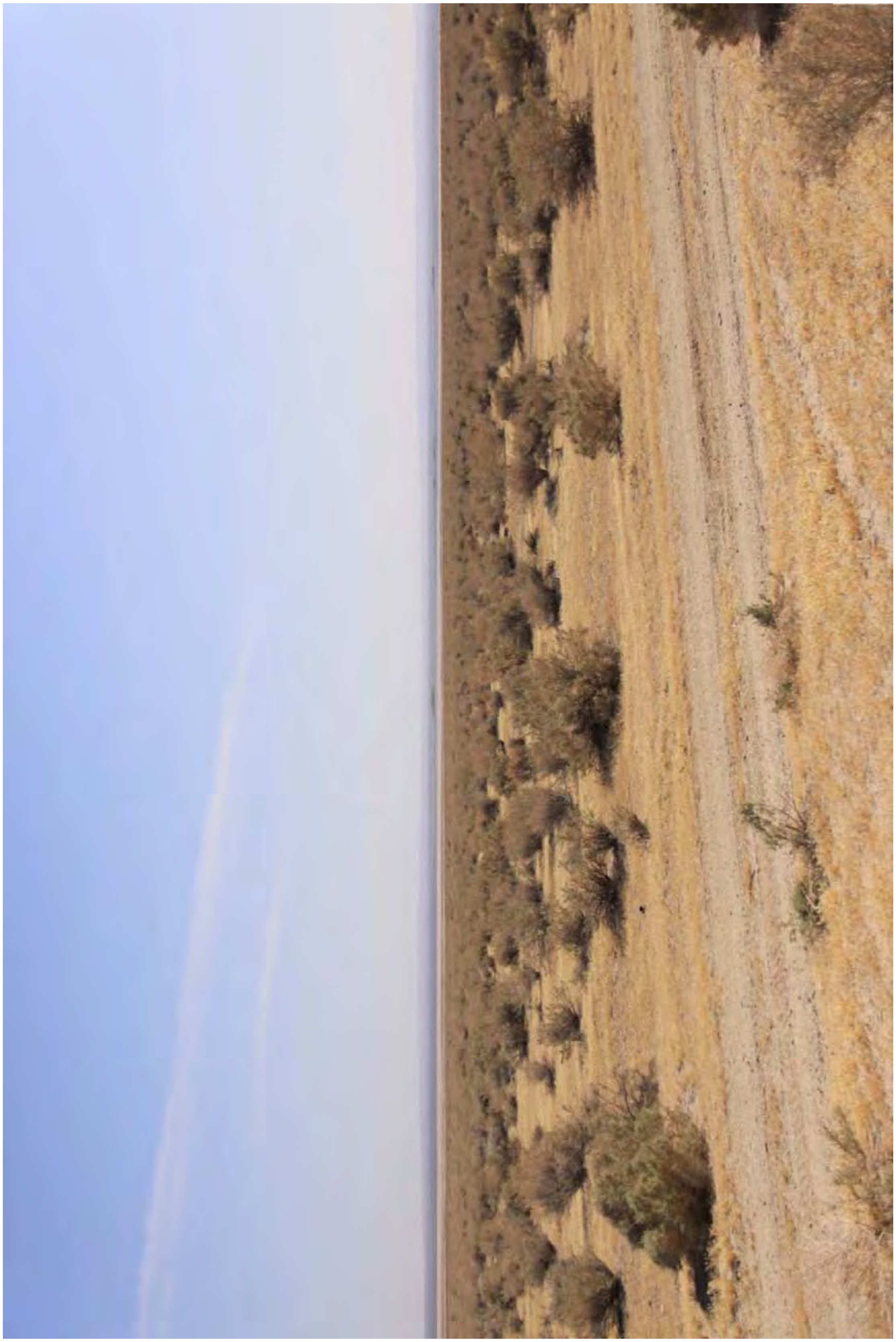


Figure 3.2-24: KOP-8 Fossil Bed Road Near Black Canyon Road (Post-Project)

Visual Contrast: Low. The AMSP and Lockhart Substation would blend in with the flat terrain of the existing landscape as seen from this distance (background). Both the Alpha and Beta power islands would be slightly visible at these distances.

Project Dominance: Low. Because the AMSP and Lockhart Substation would be seen at background distances from KOP-8 on Fossil Bed Road near Black Canyon Road, the AMSP/Lockhart Substation site would not dominate this view.

View Impairment: Low. As seen from KOP-8, the AMSP and Lockhart Substation would fit into the landscape and would not impair any views to the surrounding landscape or the horizon, leading to a low rating of view impairment.

Overall Visual Change: Low. Based on low visual contrast, low dominance, and low view impairment, the overall visual change at KOP-8 would be low.

Visual Sensitivity/Visual Change: No adverse effect. The overall visual change seen from KOP-8 at Fossil Bed Road near Black Canyon Road would be low in the context of the existing landscape's low visual sensitivity. The resulting visual impact is not adverse.

The proposed interconnection facilities could potentially result in sources of light or glare. However, overhead transmission line tubular steel poles associated with the interconnection elements could be painted light-gray or the galvanized steel could be dulled. Insulators could be made of materials that do not reflect or refract light, and conductors could be nonspecular; that is, they could be treated at the factory to dull their surfaces to reduce their potential to reflect light.

Applicable Plans and Policies

The proposed Project would include a new solar power plant and substation within a former agricultural and rural part of San Bernardino County, with a proposed telecommunication system following existing electrical transmission corridors in a former agricultural and rural area. Visual resources are addressed in the San Bernardino County General Plan (2007a), the San Bernardino County Development Code (2007b), and the San Bernardino County Ordinance No. 3900 related to glare, outdoor lighting, and night sky protection.

The AMSP would be located within the County's Desert Region (San Bernardino County 2009a). Policies and goals that are applicable to visual resources were identified in elements of the General Plan. The provisions of the General Plan that are applicable to visual resources are summarized in Appendix H, Table H-1, Conformity of Mojave Solar Project with the San Bernardino County General Plan. Implementation of the proposed Project would be compatible with the County's Desert Region and Countywide Goals and Policies for land use, circulation, conservation, and open space.

The provisions of the San Bernardino County Development Code that are applicable to visual resources are summarized in Appendix H, Table H-2, Conformity of Mojave Solar Project with the San Bernardino County Development Code. The provisions are also evaluated for conformity as if the County had jurisdiction over the AMSP/Lockhart Substation development. Implementation of the AMSP/Lockhart Substation would comply with the County's Development Code. However, due to the nature of the project, Mojave Solar would utilize xeriscape landscaping around the entrances to the control room and administrative building.

The provisions of the San Bernardino County Ordinance 3900 that are applicable to visual resources are summarized in Appendix H, Table H-3, Conformity of Mojave Solar Project with the San Bernardino County Ordinance 3900. The provisions are also evaluated for conformity as if the County had jurisdiction over the AMSP/Lockhart Substation development. Implementation of the proposed Project would comply with the County's ordinance regarding visual resources by designing light fixtures and placement of light sources that minimize light trespass, light spill, and sky glow.

The AMSP/Lockhart Substation is not within the viewshed of any state park. Therefore, there are no regulations regarding state parks that would apply to the proposed AMSP/Lockhart Substation.

3.2.3.1.2 Telecommunication System

Visual effects resulting from installation of the telecommunication system would include minor changes to the visual character of the landscape by introducing new cable on primarily existing transmission poles and within existing electrical transmission line corridors. The limited number of new poles would, however, introduce new elements into the landscape in a few areas, minimally altering the form, line, color, and texture that characterize the existing landscape. The analysis below is organized by the three fiber-optic cable routes.

Lockhart to Tortilla Substation

New fiber-optic cable would be strung on existing transmission poles for the entire route, with the exception of where three replacement poles would need to be constructed. The transmission line corridor between the proposed Lockhart Substation and Harper Lake Road is within a rural, remote area of the desert with limited opportunities for views toward this corridor, other than Harper Lake Road, which is a rural north-south road. The addition of new cable on existing structures would not substantively alter the visual setting for this segment of the fiber-optic line.

The proposed 400 feet of underground cable would require some short-term construction impacts (soils piles, construction equipment, etc.); however, the visual setting over the long term would not change. The cable is proposed to be located within the dirt shoulder of Harper Lake Road and would not be visible.

The addition of the fiber-optic cable is not projected to alter the visual setting of this entire route to the Tortilla Substation since most of the cable (with the exception of three new replacement poles and trenching discussed above) would be strung on existing electrical transmission line poles. A small segment of cable would be installed in existing underground conduit, directly west of the Tortilla Substation. No trenching or ground disturbance is anticipated with this installation. Since the cable is underground, long-term impacts to the existing visual setting are not expected. No adverse visual impacts are expected with the installation of fiber-optic cable between the proposed Lockhart Substation and existing Tortilla Substation.

Proposed telecommunication components that would be installed on BLM land consist of the fiber-optic cable installed on existing transmission line infrastructure. No other project components would be installed on BLM land on the Lockhart-Tortilla route, including the seven replacement poles and interset poles. The addition of the fiber-optic cable to the existing transmission line infrastructure would not alter the visual setting of that portion of the overhead line located on BLM land. The appearance of the cable and attachment structures would be very similar to the existing elements of form, line, color, and texture that characterize the existing transmission line conductors and attachment structures, and would not attract the attention of the casual observer. The level of change to the characteristic landscape would be very low. Installation of the fiber-optic cable would meet the objective of VRM Class III, which is to partially retain the existing character of the landscape. No visual impacts to BLM lands or conflicts with BLM management of visual resources are expected from the installation of fiber-optic cable on BLM lands between the proposed Lockhart Substation and existing Tortilla Substation.

Lockhart to Kramer Substation

The 30 new poles proposed within the AMSP site boundary would not substantively alter the visual setting of the proposed solar plant. The poles would blend in with the other elements of the AMSP, which is considered an industrial land use. Design Measure 3, listed previously under KOP-3 consequences, may also be incorporated into the design for the new poles, which would reduce visibility of the poles. After transitioning from new poles to existing poles along Lockhart Road, the fiber-optic cable is proposed to be strung on existing overhead lines all the way west to the Kramer Substation, with the exception of where three replacement poles are required—two along Harper Lake Road and one next to the Kramer Substation. The addition of new fiber-optic cable on existing utility poles is not expected to change the visual setting of the existing transmission corridors and the replacement poles would be similar in scale and height, minimizing any substantive change to the visual setting. The cable would transition into existing underground conduit at the Kramer Substation, which would not result in a visual change to the substation site. No adverse visual impacts are projected for the Lockhart to Kramer fiber-optic line.

Proposed telecommunication components that would be installed on BLM land consist of the fiber-optic cable installed on existing transmission line infrastructure. No other proposed

Project components would be installed on BLM land; the three replacement poles along this route are not located on BLM land. The addition of the fiber-optic cable to the existing transmission line would not alter the visual setting of that portion of the overhead line on BLM land viewed from U.S. 395 and SR-58. The appearance of the cable and attachment structures, as described for the Lockhart–Tortilla route above, would not attract the attention of the casual observer. In addition, the fiber-optic components on BLM land would be located at a minimum of 0.5 mile from highway viewpoints, and would not be discernible to the average observer. The level of change to the characteristic landscape would be very low. Installation of the fiber-optic cable meets the objective of VRM Class III, which is to partially retain the existing character of the landscape. No visual impacts to BLM lands or conflicts with BLM management of visual resources are expected from the installation of fiber-optic cable between the proposed Lockhart Substation and existing Kramer Substation.

Kramer to Victor Substation

The new and existing underground conduit within the Kramer Substation falls within the existing Kramer Substation. The underground cable would not alter the existing industrial facility and visual setting. Thirty new poles are proposed to be installed within two different segments of this route (Figure 2-13). As noted previously, the poles would be located within the limits of the existing utility corridors and would blend in with the existing utility structures already in place. These existing lattice towers and line dominate the viewshed along the highway, with existing structures varying in height between 100 and 120 feet. The addition of new monopoles alongside the much larger steel lattice towers would not result in a substantive change to the visual setting. Existing 220-kV towers are approximately 100 to 120 feet tall and the existing Kramer to Victor 115-kV structures are approximately 90 feet tall. The new poles would be placed intermittently along the 115-kV corridor and would be 25 to 50 feet tall. Design Measure 3, listed previously under KOP-3 consequences, may also be incorporated into the design for the new poles, which would reduce visibility of the poles. No adverse visual impacts are projected with the installation of new fiber-optic line and poles.

None of the proposed fiber-optic lines would result in a substantive change to the overall visual setting or character of the study area. None of the elements would affect a scenic vista, and none of the elements would substantially alter any scenic resources, including trees, rock outcroppings, historic buildings, or state scenic highways.

Proposed telecommunication components that would be installed on BLM land include fiber-optic cable installed on existing transmission line infrastructure, as well as on new interset poles that would be located between existing poles. No other proposed Project components would be installed on BLM land. The addition of the fiber-optic cable to the existing transmission line would not alter the visual setting of that portion of the overhead line on BLM land. The appearance of the cable and attachment structures would be very similar to the existing elements of form, line, color, and texture that characterize the existing transmission line conductors and attachment structures, and would not attract the attention of the casual observer. The level of change to the characteristic landscape would be very low.

Most of the proposed fiber-optic cable would be strung on the existing Kramer –Victor 115-kV transmission line on BLM land. Interset poles would be required within the existing utility ROW on nearly 2 miles of BLM land south of the Kramer Substation (refer to Figure 2-13 to see where the proposed interset poles would be located on BLM land. The interset poles would be similar in terms of form, line, color, and texture to the existing transmission line in the ROW. The level of change to the characteristic landscape would be low.

The addition of the interset poles as well as the new fiber-optic cable on existing and new transmission structures would meet the objective of VRM Class III, which is to partially retain the existing character of the landscape. No visual impacts to BLM lands or conflicts with BLM management of visual resources are expected from the installation of new fiber-optic line and poles on BLM land.

Applicable Plans and Policies

See discussion above under AMSP and Lockhart Substation. Refer also to Section 3.2.1 for applicable visual resource management guidelines of BLM.

3.2.3.2 No-Action Alternative

Under the No-Action Alternative, DOE would not issue Mojave Solar a loan guarantee for construction of the proposed AMSP, and Mojave Solar would not proceed with the proposed Project. Absent the solar plant, substation, interconnection, and telecommunication system, no changes to the visual character of the landscape would occur and no new elements would be introduced into the existing landscape.

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3.3 Air Quality

This section includes a description of existing air quality conditions in the study area, a summary of applicable regulations, and an analysis of potential air quality impacts of the proposed Project.

3.3.1 Regulatory Framework

Federal Standards

Air Quality Standards

U.S. Environmental Protection Agency (USEPA) air quality mandates are drawn primarily from the Clean Air Act (CAA), which was enacted in 1970. The most recent major amendments to the CAA were made by Congress in 1990. The CAA required USEPA to establish the National Ambient Air Quality Standards (NAAQS). As shown in Table 3.3-1, USEPA has established primary and secondary NAAQS for ozone, carbon monoxide (CO), nitrogen dioxide (NO_2),[1] sulfur dioxide (SO_2), respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less (PM_{10}), fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less ($PM_{2.5}$), and lead. These air pollutants are commonly referred to as "criteria air pollutants" because USEPA regulates them by developing human health-based and/or environmentally based criteria (science-based guidelines) for setting permissible levels. The primary standards protect public health, while the secondary standards protect public welfare. California Ambient Air Quality Standards (CAAQS) promulgated by the State of California, are also shown in Table 3.3-1.

When an area violates a health-based standard, the CAA requires that the area be designated as nonattainment for that pollutant. Specific geographic areas or air basins are classified as either "attainment" or "nonattainment" areas for each criteria pollutant based on the comparison of measured air quality data with federal standards.

The CAA also required each state to prepare an air quality control plan, referred to as a state implementation plan (SIP). The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. USEPA is responsible for reviewing all SIPs to determine whether they conform to the mandates of the CAA and its amendments, and to determine whether implementing the SIPs will achieve air quality goals. If an area is redesignated from nonattainment to attainment, the CAA requires a revision to the SIP, called a

[1] Nitrogen dioxide (NO_2) is one of a group of highly reactive gases known as "oxides of nitrogen," or "nitrogen oxides (NO_X)." Other nitrogen oxides include nitric oxide and nitrous oxide. While EPA's National Ambient Air Quality Standard covers this entire group of NO_X, NO_2 is the component of greatest interest and the indicator for the larger group of nitrogen oxides.

Table 3.3-1: Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	NAAQS[1] Primary[3]	NAAQS[1] Secondary[4]	CAAQS[2] Concentration[5]
Ozone (O_3)[6]	1-Hour	-	Same as Primary Standard	0.09 ppm
	8-Hour	0.075 ppm[7]		0.070 ppm
Carbon Monoxide (CO)	8-Hour	9 ppm	None	9.0 ppm
	1-Hour	35 ppm		20 ppm
	8-Hour (Lake Tahoe)	-	-	6 ppm
Nitrogen Dioxide (NO_2)	Annual Average	0.053 ppm	Same as Primary Standard	0.030 ppm [8]
	1-Hour	0.100 ppm	0.053 ppm	0.18 ppm [8]
Sulfur Dioxide (SO_2)[9]	Annual Average	0.030 ppm	-	-
	24-Hour	0.14 ppm	-	0.04 ppm
	3-Hour	-	0.5 ppm	-
	1-Hour	0.075 ppm	-	0.25 ppm
Respirable Particulate Matter (PM_{10})[10]	24-Hour	150 µg/m^3	Same as Primary Standard	50 µg/m^3
	Annual Arithmetic Mean	Revoked		20 µg/m^3 [10]
Fine Particulate Matter ($PM_{2.5}$)[11]	24-Hour	35 µg/m^3	Same as Primary Standard	-
	Annual Arithmetic Mean	15 µg/m^3		12 µg/m^3
Lead (Pb)	30-Day Average	-	-	1.5 µg/m^3
	Calendar Quarter	1.5 µg/m^3	Same as Primary Standard	-
	Rolling 3-Month Average[10]	0.15 µg/m^3	Same as Primary Standard	-
Hydrogen Sulfide (H_2S)	1-Hour	No Federal Standards		0.03 ppm
Sulfates (SO_4)	24-Hour			25 µg/m^3
Visibility Reducing Particles	8-Hour (10 a.m. to 6 p.m., Pacific Standard Time)			Extinction coefficient of 0.23 per km-visibility of 10 miles or more (0.07/30 miles for Lake Tahoe) due to particles when the relative humidity is less than 70 percent.
Vinyl Chloride[12]	24-Hour			0.01 ppm

1 NAAQS (other than O_3, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact EPA for further clarification and current federal policies.

2 California Ambient Air Quality Standards for O_3, CO (except Lake Tahoe), SO_2 (1- and 24-hour), NO_2, PM_{10}, $PM_{2.5}$ and visibility reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded.

3 National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

4 National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

5 Concentration expressed first in units in which it was promulgated. Ppm in this table refers to ppm by volume or micromoles of pollutant per mole of gas.

6 On June 15, 2005, the 1-hour ozone standard was revoked for all areas except the 8-hour ozone nonattainment Early Action Compact Areas (those areas do not yet have an effective date for their 8-hour designations). Additional information on federal ozone standards is available at http://www.epa.gov/oar/oaqps/greenbk/index.html.

7 On January 6, 2010, EPA proposed to strengthen the 8-hour primary ozone standard to a level within the range of 0.060-0.070 ppm. EPA may issue a final decision by the end of July 2011.

8 The nitrogen dioxide ambient air quality standard was amended to lower the 1-hr standard to 0.18 ppm and establish a new annual standard of 0.030 ppm. These changes became effective March 20, 2008.

9 The 24-hour and annual primary standards for SO_2 are set forth in 40 CFR §50.4. The 1-hour SO_2 primary standard is set forth in 40 CFR §50.17. The 1-hour standard was promulgated by EPA in June 2010 and became effective on August 23, 2010. EPA also revoked the 24-hour and annual primary standards, however, they will remain in effect until August 23, 2011. The SO_2NAAQS set forth in 40 CFR §50.4 will no longer apply to an area one year after the effective date of the designation of that area, pursuant to section 107 of the Clean Air Act, for the SO_2NAAQS set forth in §50. 17; except that for areas designated nonattainment for the SO_2NAAQS set forth in 40 CFR §50.4 as of the effective date of §50. 17, and areas not meeting the requirements of a State Implementation Plan call with respect to requirements for the SO_2NAAQS set forth in 40 CFR §50.4, the SO_2NAAQS set forth in 40 CFR §50.4 will apply until that area submits, pursuant to section 191 of the Clean Air Act, and EPA approves, an implementation plan providing for attainment of the SO_2NAAQS set forth in §50.17.

10 Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, EPA revoked the annual PM_{10} standard on December 17, 2006.

11 Effective December 17, 2006, EPA lowered the $PM_{2.5}$ 24-hour standard from 65 µg/m^3 to 35 µg/m^3.

12 ARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

ppm = parts per million; µg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter; km = kilometers

Source: CARB 2010a

maintenance plan, to demonstrate how the air quality standard will be maintained for at least 10 years. In California, local air pollution control districts have the primary responsibility for developing and adopting the regional elements of the California SIP.

Lead, hydrogen sulfide, and vinyl chloride, included in Table 3.3-1, are not addressed in this evaluation. Although there is a federal NAAQS for lead and a CAAQS for hydrogen sulfide and vinyl chloride, negligible emissions of these pollutants would be generated during the construction and operation phases of the proposed Project.

<u>General Conformity</u>

The 1990 Amendment to CAA Section 176 requires USEPA to promulgate rules to ensure that federal actions conform to the appropriate SIP. These rules, known as the General Conformity Rule (40 C.F.R. Parts 51.850–51.860 and 93.150–93.160), require any federal agency, responsible for an action in a federal nonattainment/maintenance area, to demonstrate conformity to the applicable SIP, by either determining that the action is exempt from the General Conformity Rule requirements, or subject to a formal conformity determination. DOE's guidance document, *CAA General Conformity Requirements and the NEPA Process* (DOE 2000), outlines the specific steps for addressing CAA conformity requirements in NEPA documents.

There are two phases to addressing CAA conformity requirements. In the first phase, the conformity *review* process, the federal agency evaluates whether the conformity regulations would apply to an action (which, in turn, determines if the second phase of analysis is required). The second phase of analysis is the conformity *determination* process, in which the federal agency demonstrates how an action would conform to the applicable SIP (DOE 2000). Actions would be exempt, and thus conform to the SIP, if an applicability analysis shows that the total direct and indirect emissions of nonattainment/maintenance pollutants from Project construction and operation activities would be less than specified emission rate thresholds, known as *de minimis* levels, and that these emissions would be less than 10% of the area's annual emission budget for subject pollutants.

The General Conformity Rule is applicable only for criteria air pollutants and their precursors for which an area is designated nonattainment or that is covered by a maintenance plan. The proposed Project is located in the Mojave Desert Air Basin (MDAB), which is a moderate federal nonattainment area for 8-hour ozone and PM_{10}. Therefore, the General Conformity Rule is applicable to proposed Project emissions of ozone precursors (volatile organic compounds [VOCs][2] and oxides of nitrogen [NO_X]) and PM_{10}. The proposed Project would include

2 The California Air Resources Board describes Reactive Organic Gases to mean *any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, as well as some other specified negligible photochemically reactive organic compounds such as methane and ethane, and acetone.* Volatile organic compound (VOC) is the term used throughout codified Federal regulations and is defined in 40 CFR 51.100(s): *Volatile organic compounds (VOC) means any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions.* Excluded are some organic

construction equipment and operational activities that would emit VOCs, NO_X,[3] and PM_{10}. The applicable *de minimis* levels for the proposed Project are shown in Table 3.3-2.

Table 3.3-2: Applicable General Conformity *de minimis* Levels

Pollutant	Emission (tons/year)
VOCs	100[1]
NO_X	100[2]
PM_{10}	100[2]

[1] Moderate nonattainment area for 8-hour ozone.
[2] Moderate nonattainment area for PM_{10}.
Source: 40 C.F.R. 93 § 153

Criteria Air Pollutant Analysis

When considering overall compliance with ambient air quality standards, all pollutants for which there are standards (relating to attainment and nonattainment pollutant emissions) are considered, not just the nonattainment pollutant emissions considered in a General Conformity analysis. Therefore, in addition to the nonattainment pollutant emissions of VOCs, NO_X, and PM_{10}, emissions of CO, oxides of sulfur (SO_X), and $PM_{2.5}$, are included in the overall ambient air quality analysis. Significant emissions thresholds are established by the Mojave Desert Air Quality Management District (MDAQMD). While there are no NEPA-established "significance thresholds," this analysis draws upon MDAQMD's significant emissions thresholds as numerical benchmarks or yardsticks to assess the proposed Project's air quality impacts.

Hazardous Air Pollutants

Air quality regulations also focus on hazardous air pollutants. USEPA has identified 188 air toxics as hazardous air pollutants. In general, for those hazardous air pollutants that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which adverse health impacts may not be expected to occur. This contrasts with the criteria air pollutants for which acceptable levels of exposure can be determined and for which ambient standards have been established (Table 3.3-1). Instead, USEPA regulates hazardous air pollutants through statutes and regulations that generally require the use of maximum achievable control technology (MACT) to limit emissions. Primary

compounds that have been determined to have negligible photochemical reactivity such as methane, ethane, acetone and others listed in 40 CFR51.100(s). The Federal term "VOC" is used in this analysis.

[3] NO_X is the generic term for a group of highly reactive gases, all of which contain nitrogen and oxygen in varying amounts, and primarily consists of nitric oxide (NO), nitrogen dioxide (NO_2), and a small amount of nitrous oxide (N_2O). The General Conformity rule has a *de minimis* level of 100 tons per year for both the criteria air pollutant NO_2 and generic NO_X for marginal and moderate nonattainment areas inside an ozone transport region, maintenance areas, and other areas outside an ozone transport region. *De minimis* levels for NO_X are lower in serious, severe, and extreme nonattainment areas. Note: NO is regulated as N_2O.

hazardous air pollutants of concern include diesel particulate matter (diesel PM), asbestos, and lead.

California Standards

In addition to the NAAQS, USEPA allows states to set more stringent state air quality standards based on the state's air quality. The California Air Resources Board (CARB) has established the CAAQS for most of the criteria pollutants and additional pollutants, which are comparatively shown with NAAQS in Table 3.3-1. CAAQS are recommended by the California Office of Environmental Health Hazard Assessment and must be met per the requirements of the California Clean Air Act.

California Energy Commission Certification Process

The AMSP and its related facilities are subject to CEC licensing jurisdiction. (Public Resources Code, § 25500 et seq.). During licensing proceedings, CEC acts as lead State agency under CEQA. (Public Resources Code, §§ 25519(c), 21000 et seq.) CEC's regulatory process, including the evidentiary record and associated analyses, is functionally equivalent to the preparation of an environmental impact report. (Public Resources Code, § 21080.5.) The process is designed to complete the review within a specified time period when the required information is submitted in a timely manner. A license issued by CEC is in lieu of other State and local permits.

The AMSP proponent prepared an air quality analysis for the AMSP as part of the CEC environmental review process (AMSP Air Quality Analysis). The AMSP Air Quality Analysis provided a detailed list of all potential laws, ordinances, and regulations; a description of the affected environment; and the potential effects from both construction and operation. The AMSP Air Quality Analysis also identified design features and control strategies that would reduce air quality impacts. Finally, the AMSP Air Quality Analysis proposed conditions of approval to ensure compliance to the applicable regulations. The AMSP Air Quality Analysis, as contained in the AFC (09-AFC-5), was independently evaluated by CEC staff in a Staff Assessment (CEC 2010a, b). The Staff Assessment examined engineering, environmental, public health, and safety aspects of the AMSP, based on the information provided by the Applicant and other sources available at the time the Staff Assessment was prepared. The Staff Assessment contains analyses similar to those normally contained in an environmental impact report required by CEQA. CEC released a Supplemental Staff Assessment (SSA – Part B) to provide further data on the air quality analysis.

CEC staff have the responsibility to complete an independent assessment of the AMSP's engineering design and identify the potential impacts on the environment and the public's health and safety, and determine whether the AMSP conforms to all applicable laws, ordinances, regulations, and standards. Upon identifying any potentially significant environmental impacts, staff recommend mitigation measures in the form of Conditions of Certification for construction, operation, and eventual closure of the AMSP. CEC concluded that the AMSP will conform with all applicable laws, ordinances, regulations, and standards relating to air quality and implementation of the mitigation measures described in the record and contained in the Conditions of Certification ensures that the AMSP will not result in significant direct, indirect, or cumulative air quality impacts in conformance with NEPA and CEQA requirements. CEC approved the AFC on September 8, 2010, and issued the final decision on September 15, 2010. The data relative to the AMSP presented herein have been reviewed and accepted by CEC.

Regional Standards

In the MDAB, MDAQMD is the agency responsible for protecting public health and welfare through the administration of federal and state air quality laws and policies. Included in air pollution control districts' tasks are the monitoring of air pollution, the preparation and implementation of their portion of the SIP, and the promulgation of Rules and Regulations. The SIP for each air district includes strategies and tactics to be used to attain and maintain acceptable air quality in each jurisdiction including establishing annual air emission budgets for the area. In the MDAB, this list of strategies is contained in the ozone and PM_{10} attainment plans. Rules and Regulations for each district include procedures and requirements to control the emission of pollutants and prevent significant adverse impacts.

MDAQMD regulations require permits for any equipment that emits air contaminants before construction, installation, or operation (e.g., Authority to Construct [ATC] or Permit to Operate). MDAQMD Regulation XIII (New Source Review) sets forth the requirements for the preconstruction review of all new or modified facilities. Regulation VIII Rule 1302 requires a demonstration that all major stationary sources are either in compliance or on a schedule for compliance with all applicable emissions limitations under the CAA. Regulation VIII Rule 1303 sets forth the best available control technology (BACT) requirements for facility emissions.

<u>AMSP Air Quality Permitting Process</u>

The Air Quality Analysis that was prepared for the CEC AFC included a list of all applicable MDAQMD Rules and Regulations and demonstrated the AMSP's compliance with the same (see Appendix I). Additionally, MDAQMD issued a Preliminary Determination of Compliance for the AMSP on March 1, 2010 (MDAQMD 2010a), and a Final Determination of Compliance on May 13, 2010 (MDAQMD 2010b). MDAQMD issued a revised Final Determination of Compliance dated July 1, 2010, with revised permit conditions. The Final Determination of Compliance documents MDAQMD's final decision on an Application for New Source Review for the proposed AMSP. As required by MDAQMD Rule 1306(E)(3)(a), the Final Determination of Compliance reviewed the proposed AMSP, evaluating worst-case or maximum air quality impacts, and established control technology requirements and related air quality permit conditions. The Final Determination of Compliance represents MDAQMD's final preconstruction compliance review of the proposed AMSP, to determine whether construction and operation of the proposed AMSP will comply with all applicable MDAQMD rules and regulations. Compliance with all District rules and regulations was demonstrated to the District's satisfaction in the Final Determination of Compliance, subject to specified permit conditions. The District's Final

Determination of Compliance conditions for the AMSP portion of the proposed Project are presented in the Conditions of Certification (AQ-1 through AQ-57) included in Appendix I.

The CAA established the Prevention of Significant Deterioration permit program to prevent areas that currently have clean air from significant deterioration. The Prevention of Significant Deterioration permit program limits emissions by requiring permits for major stationary air pollution sources. MDAQMD determined that the proposed Project does not have the potential to emit 25 tons per year or more of criteria pollutants and so is not required to complete such an evaluation. The AMSP is not a major source nor is it subject to the Prevention of Significant Deterioration requirements Title I, Part C of the federal CAA (42 U.S.C. §§7470–7492) which apply to major sources only and therefore is in compliance with the Prevention of Significant Deterioration requirements of MDAQMD Rule 1300. MDAQMD placed permit conditions on the ATC for the project. The permit conditions are included in Appendix I, under the heading of "District Conditions, District Final Determination of Compliance Conditions" (MDAQMD 2010b). Separate permits will be issued for each auxiliary boiler, RTF ullage/expansion system, gas dispensing facility, cooling tower, fire pump, and emergency generator.

MDAQMD Regulation XIII – *New Source Review* requires offsets for nonattainment pollutants and their precursors emitted by large, new sources. The proposed Project does not have the potential to emit 25 tons or more per year of criteria air pollutants and precursors. Therefore, offsets are not required for the AMSP. Additionally, MDAQMD Rule 1303 requires BACT at major new sources and permit units that have the potential to emit more than 25 pounds per day of criteria pollutants. As this facility is not a major source, BACT is only required for the wet cooling towers, which have the potential to emit more than 25 pounds per day of a nonattainment air pollutant (PM_{10}). The proposed Project will not be required to submit applications for a Federal operating permit because this facility is not a major source nor is a Federal operating permit required under any applicable Federal regulation.

MDAQMD CEQA and Federal Conformity Guidelines

MDAQMD has published CEQA and federal Conformity Guidelines that provide district-defined "significant emissions thresholds" for criteria air pollutants and precursors (Table 3.3-3) (MDAQMD 2009). Emissions above these thresholds were viewed to require sufficient mitigation to reduce levels to below these thresholds or to incorporate all feasible mitigation. Emission thresholds are given as a daily value and an annual value, so that multiphase projects (such as projects with a construction phase and a separate operational phase) with phases shorter than 1 year can be compared to the daily value. Construction of the proposed Project would last more than 1 year; therefore, annual thresholds are applied for this analysis. These MDAQMD significant emissions thresholds were drawn upon to provide a yardstick for the assessment of any impact of Project emissions.

Table 3.3-3: MDAQMD CEQA Significant Emissions Thresholds

Pollutant	Annual Threshold, tons	Daily Threshold, lbs
Carbon Monoxide (CO)	100	548
Oxides of Nitrogen (NO_X)	25	137
Volatile Organic Compounds (VOCs)	25	137
Oxides of Sulfur (SO_X)	25	137
Particulate Matter (PM_{10})	15	82
Particulate Matter ($PM_{2.5}$)	15	82

Source: MDAQMD 2009

In addition, the following criterion was drawn upon to assess the project's hazardous air pollutant emissions: The project's hazardous air pollutant emissions would represent an adverse impact if they would:

- Expose sensitive receptors to substantial pollutant concentrations, including those resulting in a cancer risk greater than or equal to 10 in a million and/or a hazard index (noncancerous) greater than or equal to 1.

3.3.2 Study Methodology

The evaluation of potential air quality impacts from proposed Project construction and operation includes reviewing relevant air quality laws, ordinances, and regulations; characterizing the existing air quality environment throughout the project area; and estimating air emissions from construction and operation of project facilities.

In addition to the analysis performed for the AMSP, the following analysis addresses the Lockhart Substation, interconnection to the offsite transmission grid, and installation of fiber-optic telecommunication line. The analysis for these proposed Project components can be found in Section 3.3.5.1.1. Together, these analyses assess all components of the proposed Project.

3.3.3 Greenhouse Gases and Global Climate Change

Greenhouse gases (GHGs) are gases in the earth's atmosphere that are transparent to short-wave length incoming solar radiation, but absorb the longer wave length infrared radiation re-emitted from the earth's surface warmed by incoming solar radiation. In simple terms they "trap heat." Over time, the amount of energy sent from the sun to the earth's surface should be about the same as the amount of energy radiated back into space, leaving the temperature of the earth's surface roughly constant. Most studies, however, indicate that the earth's climate has warmed over the past century and that human activity affecting the atmosphere is likely an important contributing factor. Computer-based modeling suggests that rising GHG concentrations generally produce an increase in the average temperature of the earth, which may produce changes in sea levels, rainfall patterns, and intensity and frequency of extreme weather events. Collectively, these effects are referred to as "climate change." The

Intergovernmental Panel on Climate Change, in its Fourth Assessment Report, stated that warming of the earth's climate system is unequivocal and that warming is very likely due to anthropogenic GHG concentrations (Intergovernmental Panel on Climate Change 2007). These gases are emitted as a result of natural processes and human activities.

Climate change associated with global warming is predicted to produce negative environmental, economic, and social consequences across the globe. Recent observed changes include shrinking glaciers, thawing permafrost, a lengthened growing season, and shifts in plant and animal ranges (Intergovernmental Panel on Climate Change 2007). Predictions of long-term negative environmental impacts include sea level rise; changing weather patterns with increases in the severity of storms and droughts; changes to local and regional ecosystems, including the potential loss of species; and a significant reduction in winter snow pack. Predictions of these effects specific to California include exacerbation of air quality problems; a reduction in municipal water supply from the Sierra Nevada snowpack; a rise in sea level that would displace coastal businesses and residences; damage to marine and terrestrial ecosystems; and an increase in the incidence of infectious diseases, asthma, and other human health problems (Cal/EPA 2006).

Aside from water vapor, a naturally occurring GHG that accounts for the largest percentage of the greenhouse effect, the most common GHGs emitted from natural processes and human activities include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Examples of GHGs created and emitted primarily through human activities include fluorinated gases (hydrofluorocarbons and perfluorocarbons) and sulfur hexafluoride. Each GHG is assigned a global warming potential. The global warming potential is the ability of a gas or aerosol to trap heat in the atmosphere. The global warming potential rating system is standardized to CO_2, which has a value of one. For example, CH_4 has a global warming potential of 21, which means that it has a global warming effect 21 times greater than CO_2 on an equal-mass basis. To simplify analyses, total GHG emissions from a source are often expressed as a CO_2 equivalent (CO_2e). The CO_2e is calculated by multiplying the emission of each GHG by its global warming potential and adding the results together to produce a single, combined emission rate representing all GHGs.

Federal agencies are, on a national scale, addressing emissions of GHGs by reductions mandated in federal laws and Executive Orders (EOs) including, most recently, EO 13423 (Strengthening Federal Environmental, Energy, and Transportation Management), signed in January 2007. In October 2009, USEPA promulgated a regulation to require reporting of GHG emissions from all sectors of the economy. The final rule applies to fossil fuel suppliers and industrial gas suppliers, direct GHG emitters and manufacturers of heavy-duty and offroad vehicles and engines. The rule does not require control of GHGs; rather, it requires only that sources emitting more than 25,000 metric tons of CO_2e monitor and report emissions. The proposed Project would not be subject to the rule since its emissions fall below this level, as explained below. In June 2010, USEPA issued the rule to tailor applicability criteria that determine which stationary sources and modification projects become subject to permitting requirements for GHG emissions under the Prevention of Significant Deterioration and Title V programs of the CAA. On December 23, 2010, USEPA issued a series of rules that put the necessary regulatory framework in place to ensure that industrial facilities can get CAA permits covering their GHG emissions when needed, and facilities emitting GHGs at levels below those established in the Tailoring Rule do not need to obtain CAA permits.

On December 7, 2009, USEPA adopted its Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the CAA (Endangerment Finding). The Endangerment Finding is based on Section 202(a) of the CAA, which states that the administrator (of USEPA) should regulate and develop standards for “emission[s] of air pollution from any class or classes of new motor vehicles or new motor vehicle engines, which in [its] judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare.” The administrator of USEPA found that atmospheric concentrations of GHGs endanger the public health and welfare within the meaning of Section 202(a) of the CAA. The administrator of USEPA also found that GHG emissions from new motor vehicles and motor vehicle engines are contributing to air pollution, which is endangering public health and welfare.

Several states have promulgated laws as a means to reduce statewide levels of GHG emissions. In particular, the California Global Warming Solutions Act of 2006 directs the State of California to reduce statewide GHG emissions to 1990 levels by the year 2020. In addition, groups of states (such as the Western Climate Initiative) have formed regionally based collectives to jointly address GHG pollutants.

The potential effects of proposed GHG emissions are by nature global and cumulative in nature. An appreciable impact on global climate change would only occur when proposed GHG emissions combine with GHG emissions from other man-made activities on a global scale.

CEQ issued a draft guidance memorandum in February 2010 for analyzing the environmental effects of GHG emissions and climate change in NEPA documents. Specifically, the guidance states that if a proposed action would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of CO_2e GHG emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public. For long-term actions that have annual direct emissions of less than 25,000 metric tons of CO_2e, CEQ encourages federal agencies to consider whether the action’s long-term emissions should receive similar analysis. CEQ does not propose this as an indicator of a threshold of significant effects, but rather as an indicator of a minimum level of GHG emissions that may warrant some description in the appropriate NEPA analysis for agency actions involving direct emissions of GHGs (CEQ 2010).

Table 3.3-4 summarizes the annual GHG emissions associated with implementation of the proposed Project. Appendix I presents the estimated GHG emissions generated by the proposed Project. As shown in Table 3.3-4, the proposed Project would emit less than 25,000 metric tons CO_2e of GHG emissions per year during construction and operation. It follows from the CEQ GHG guidance that the level of these CO_2e emissions is sufficiently low that no further analysis would be warranted.

Table 3.3-4: Summary of Annual Operational and Construction-Related Emissions of Greenhouse Gases (Carbon Dioxide Equivalent)

Source	Estimated Annual Emissions (metric tons CO_2e)
Construction[1]	
AMSP[2]	19,853
Lockhart Substation[3]	952
Transmission Lines[3]	555
Telecommunication System[3]	443
Total Construction Emissions	21,803
Operations	
AMSP[2]	10,884
Total Operational Emissions	10,884

[1] The total construction emissions would occur over 26 months. Average annual construction GHG emissions are shown here.
[2] CEC AFC 2009. See Appendix I for detailed emissions data.
[3] Data modeled by AECOM.

Construction GHG emissions would be finite and temporary and would cease when construction activities are completed. While the AMSP would emit some operational GHG emissions, its contribution to the system build-out of renewable resources to meet the goals of the Renewable Portfolio Standard in California would result in a net reduction compared to the GHG emissions from new and existing fossil-fired electricity resources. It is reasonable to assume that the solar power produced from the AMSP would offset the need to build and operate fossil-fuel generation plants. CEC estimates that the AMSP would generate power at an annual rate of 600,000 net-megawatt hours (MWh) (CEC 2010b). Using the CPUC and CEC performance value of 1,100 pounds of CO_2 per MWh,[4] a CO_2 differential between the AMSP and a comparable fossil-fuel facility of approximately 299,000 metric tons per year would result.

As seen in Table 3.3-4, these CO_2e emissions would be substantially below 50,000 tons per year and no sources with a potential to emit less than 50,000 tons per year of CO_2e would be subject to Prevention of Significant Deterioration or Title V permitting for GHG emissions before 2016 under the provisions of USEPA's final "tailoring" rule issued on June 3, 2010, to phase in GHG permitting requirements.

[4] Title 20, California Code of Regulations, section 2900 et seq. prohibits utilities from entering into long-term contracts with any base load facility that does not meet a greenhouse gas emission standard of 0.5 metric tons carbon dioxide per megawatt-hour (0.5 metric tons CO_2/MWh) or 1,100 pounds carbon dioxide per megawatt-hour (1,100 lbs CO_2/MWh).

3.3.4 Affected Environment

Climate, Topography, and Meteorology

The ambient concentrations of air pollutants are determined by the amount of emissions released by sources and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and sunlight. Therefore, existing air quality conditions in the area are determined by such natural factors as topography, meteorology, and climate, in addition to the amount of emissions released by existing air pollutant sources. In the project study area, inversions and light winds can result in conditions for pollutants to accumulate in the region.

The proposed Project is located in San Bernardino County, which lies within the MDAB, an assemblage of mountain ranges interspersed with long broad valleys that often contain dry lakes. Many of the lower mountains that exist in this vast terrain rise from 1,000 to 4,000 feet above the valley floor. Prevailing winds in the MDAB are out of the west and southwest. These prevailing winds are due to the proximity of the MDAB to coastal and central regions and the blocking nature of the Sierra Nevada to the north.

During the summer, the MDAB is generally influenced by a Pacific Subtropical High cell that sits off the coast, inhibiting cloud formation and encouraging daytime solar heating. The MDAB is rarely influenced by cold air masses moving south from Canada and Alaska, as these frontal systems are weak and diffuse by the time they reach the desert. Most desert moisture arrives from infrequent warm, moist, and unstable air masses from the south. The MDAB averages between 3 and 7 inches of precipitation per year (from 16 to 30 days with at least 0.01 inch of precipitation). The MDAB has a dry-hot desert climate, with portions that are dry-very hot desert where maximum average temperatures are over 100.4°F for at least 3 months a year.

The warmest month for the region is typically July and the coldest month is December. The month with the highest precipitation is usually February. The western Mojave Desert region experiences a large number of days each year with sunshine, generally 345+ days per year. The region also traditionally experiences excellent visibility, i.e., greater than 10 miles or more 95% of the time. Representative and quantitative climatic data for the project area are included in Appendix I.

Regional and Ambient Air Quality

Criteria air pollutant concentrations are measured at 11 monitoring stations in the MDAB. Table 3.3-5 summarizes the air quality data recorded for 2007, 2008, and 2009 at the Barstow monitoring station.

Table 3.3-5: Barstow Monitoring Station – Ambient Air Quality

Pollutant	Averaging Time	Federal Primary Standards	California Air Quality Standards	Maximum Concentrations(1)			Number of Days Exceeding Federal Standard(2)			Number of Days Exceeding State Standard(2)		
				2007	2008	2009	2007	2008	2009	2007	2008	2009
Ozone	1 hour	0.12 ppm(3)	0.09 ppm	0.099	0.104	0.095	0	0	0	2	5	1
	8 hour	0.075 ppm	0.070 ppm	0.088	0.096	0.086	25	7	5	46	23	18
Carbon Monoxide	8 hour	9.0 ppm	9.0 ppm	0.70	1.23	0.89	0	0	0	0	0	0
Nitrogen Dioxide	1 hour	0.100 ppm	0.18 ppm	0.073	0.081	0.060	–	–	–	0	0	0
	Annual	0.053 ppm	0.030 ppm	0.020	0.019	0.016	0	0	0	0	0	0
PM_{10}(4)	24 hours	150 $\mu g/m^3$	50 $\mu g/m^3$	202.0	93.0	76.0	1	0	0	5	2	1
	Annual	Revoked	20 $\mu g/m^3$	29.8	26.1	*	–	–	–	1	1	*

"–" = data not available or applicable.
"*" = there were insufficient data to determine the value.
(1) Concentration units for ozone, carbon monoxide, and nitrogen dioxide are in parts per million (ppm). Concentration units for PM_{10} are in micrograms per cubic meter ($\mu g/m^3$).
(2) For annual standards, a value of 1 indicates that the standard has been exceeded.
(3) The federal 1-hour ozone standard was revoked in June 2005.
(4) PM_{10} data are recorded separately for federal and state purposes because USEPA and California methods are slightly different. Federal values are shown. PM_{10} is measured every 6 days; the number of days exceeding standards is projected to a 365-day base from the measurements.
Source: CARB 2009b

Both CARB and USEPA use such monitoring data to designate areas according to their attainment status for criteria air pollutants. The purpose of these designations is to identify the areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are nonattainment, attainment, and unclassified. Unclassified is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. In addition, the California designations include a subcategory of nonattainment-transitional, which is given to nonattainment areas that are progressing and nearing attainment.

The MDAB is currently classified as a federal nonattainment area for ozone (moderate) and PM_{10} (moderate), and an attainment/unclassified area for $PM_{2.5}$ (USEPA 2009). The MDAB is classified as a state nonattainment area for ozone, PM_{10}, and $PM_{2.5}$. The MDAB currently meets the federal and state standards for CO, NO_2, SO_2, and lead and is classified as an attainment area for these pollutants (CARB 2009a).

Sensitive Receptors

Some members of the population are especially sensitive to air pollutant emissions and should be given special consideration when evaluating air quality impacts from projects. These people include children, the elderly, or those with preexisting respiratory or cardiovascular illness.

Structures that house these persons or places where they gather are defined as sensitive receptors.

3.3.4.1 AMSP and Lockhart Substation

The area surrounding the AMSP/Lockhart Substation site is sparsely populated with six to eight widely separated residences located between approximately 0.5 and 1.6 miles from the AMSP/Lockhart Substation site. These are the closest known residential properties and there are no other sensitive receptors (such as schools, places of worship, or medical facilities) in the vicinity of the AMSP/Lockhart Substation site.

3.3.4.2 AMSP Telecommunication System

The Lockhart to Tortilla line is located partially within the AMSP boundary and along existing transmission line corridors all the way to the Tortilla Substation located in the City of Barstow. There are sensitive receptors located in proximity to the southern portion of this alignment, and residential areas are adjacent to this route, primarily in the developed areas surrounding Barstow.

The Lockhart to Kramer line is located partially within the AMSP and along existing transmission line corridors all the way to the Kramer Substation. Most of this route is in remote areas of the County with the exception of the far west end of the route that traverses a mixed-use retail/commercial zone near Highway 395/SR-58. These uses would not be considered sensitive receptors.

The Kramer to Victor line is located mostly along U.S. Highway 395 in an undeveloped portion of the County. The route does traverse a more urban setting for the southern one-third of the alignment, crossing partially through mixed retail, commercial, and industrial before crossing back over into undeveloped open space just north of the Victor Substation. The urban uses along this route would not be considered sensitive land uses.

3.3.5 Environmental Consequences

3.3.5.1 Proposed Action

The proposed Project would generate air pollutant emissions from construction and operation of the AMSP and Lockhart Substation and the telecommunication system. Construction activities would generate temporary (short-term) emissions such as fugitive dust emissions (PM_{10} and $PM_{2.5}$) from earth movement (grading) activities, and exhaust emissions (NO_X, SO_2, CO, VOCs, $PM_{2.5}$, and PM_{10}) from construction equipment and vehicles. Emissions would also be generated due to operation of the AMSP and Lockhart Substation. Operational emissions would include emissions from the proposed auxiliary boilers, fire pumps, emergency generator engines, heat transfer (HTF) system, and cooling towers.

Construction Emissions

Construction emissions were estimated for the proposed Project. Construction emissions associated with the AMSP were estimated for the CEC AFC and are used herein. Emissions associated with construction of the Lockhart Substation, transmission lines, and telecommunication systems were estimated using the URBEMIS 2007 model, version 9.2.4 (Rimpo and Associates 2008). URBEMIS is designed to model construction emissions for land use projects and contains emission factors from CARB's EMFAC2007 and OFFROAD2007 models. Modeling was based on project-specific data (e.g., amount of land to be disturbed/graded per day, types of equipment to be used, number of construction employees), when available. However, when project-specific information was not available, reasonable assumptions and default settings were used to estimate criteria air pollutant and ozone precursor emissions. A detailed list of modeling assumptions is provided in Appendix I.

While the emissions are the actual mass of pollutants emitted from the proposed Project, the impacts are the concentration of pollutants from the proposed Project that reach the ground level. The emissions from the proposed Project, both stationary source and onsite mobile source emissions, were analyzed through the use of air dispersion models to determine the probable impacts at ground level as part of the AFC process and CEC's Staff Assessment. Air dispersion models provide a means of predicting the location and ground level magnitude of the impacts of a new emissions source. The model results are generally described as maximum concentrations, often described as a unit of mass per volume of air, such as micrograms per cubic meter ($\mu g/m^3$). USEPA's guideline ARMS/EPA Regulatory Model was used to estimate ambient impacts from proposed Project construction.

Construction of all project components would occur over 26 to 31 months, from spring 2011 to mid to late 2013. It was assumed that construction phases for each component of the proposed Project (i.e., AMSP, Lockhart Substation, transmission lines, and telecommunication system) would overlap to represent a worst-case scenario.

The Air Quality Analysis for the AMSP AFC included several measures to control emissions during construction. These measures are also proposed to be incorporated for construction of the Lockhart Substation and telecommunication system, as appropriate. The measures are considered part of the proposed Project and were included in the analysis of potential impacts. The measures include standard dust control requirements such as: watering on unpaved roads, disturbed areas, and laydown construction sites; limiting vehicle speed on unpaved areas; preventing vehicle dust trackout; limiting access points; and covering or revegetating inactive areas. In addition, exhaust emissions will be controlled by using USEPA/CARB Tier II/Tier III engine compliant equipment, limiting equipment idling, and using low sulfur diesel fuel. The measures are described in detail in Appendix S.

Estimated maximum annual emissions for each component of the proposed Project and the total worst-case annual project emissions are shown in Table 3.3-6. Modeled emissions for AMSP construction and URBEMIS output sheets are provided in Appendix I.

Table 3.3-6: Estimated Annual Construction Emissions

Source	Air Pollutant Emissions (tons/year)					
	VOCs	NO_X[1]	CO	SO_2	PM_{10}	$PM_{2.5}$
AMSP[2]	17.1	88.6	99.3	0.2	19.8	7.8
Lockhart Substation[3]	0.46	1.83	5.29	0.01	0.21	0.17
Transmission Lines[3]	0.36	1.50	2.49	0.00	0.52	0.19
Telecommunication System[3]	0.33	1.36	1.84	0.00	0.86	0.27
Total Annual Emissions	18.25	93.29	108.92	0.21	21.39	8.43
General Conformity De Minimis Levels	*100*	*100*			*100*	
MDAQMD Significant Emissions Thresholds[4]	*25*	*25*	*100*	*25*	*15*	*15*

1 Represents NO_X measure as NO_2. NO_X emissions include average percent reductions from use of Tier II construction equipment, which is a control measure for the project (SCAQMD 2010).
2 CEC AFC 2009. See Appendix I for detailed construction emissions data.
3 Data modeled by AECOM.

General Conformity Analysis

As shown in Table 3.3-6, the estimated annual emissions of VOCs, NO_X, and PM_{10} for the proposed Project would be less than the General Conformity annual *de minimis* levels. The analysis indicates that the proposed Project would conform to the SIP and a formal conformity determination would not be required.

Criteria Air Pollutant Analysis

As Table 3.3-6 shows, the estimated annual emissions of VOCs, SO_2, and $PM_{2.5}$ would be less than MDAQMD's annual significant emissions thresholds (drawn upon here as a comparative yardstick), and on that basis their impact can hence be regarded *de minimis*. This is consistent with the associated air concentration estimates in Table 3.3-7 as discussed below. CO annual emissions are just above the MDAQMD annual significant emissions threshold but their impact can be considered small, consistent with the low cross-cutting air concentration estimate shown in Table 3.3-7. PM_{10} annual emissions are approximately 40% higher than the MDAQMD yardstick. The impacts of these emissions on resulting PM_{10} air pollutant concentrations are discussed below.

Using estimated peak onsite hourly, daily, and annual construction equipment exhaust emissions, the proposed Project's construction air pollutant concentrations associated with the AMSP were modeled as part of the AFC process to determine impacts.

Project impacts were modeled using the ARMS/EPA Regulatory Model as well as the latest versions of the ARMS/EPA Regulatory Model preprocessors to determine surface characteristics (AERSURFACE), to process meteorological data (AERMET), and to determine receptor slope factors (AERMAP). The purpose of the ARMS/EPA Regulatory modeling analysis was to evaluate compliance with the California and federal air quality standards.

Table 3.3-7: Estimated Construction Air Pollutant Concentrations

Pollutants	Averaging Period	Impacts (µg/m³)	Background[1] (µg/m³)	Total Impact (µg/m³)	Standard (µg/m³)	Incremental Contribution of Project
NO_2	1-hour	177	154	331	339	54%
	Annual	1.8	42	43.8	57	4%
PM_{10}	24-hour	72	154	226	50	32%
	Annual	1.8	38.4	40.2	20	5%
$PM_{2.5}$	24-hour	15	28.0	43	35	35%
	Annual	0.45	10.4	10.9	12	4%
CO	1-hour	94	4,025	4,119	23,000	2%
	8-hour	31	1,789	1,820	10,000	2%
SO_2	1-hour	0.18	94	94.2	665	0.2%
	3-hour	0.08	23	23.1	1300	0.3%
	24-hour	0.03	13	13.0	105	0.2%
	Annual	0.003	3	3.0	80	0.1%

[1] The nearest criteria pollutant air quality monitoring sites to the proposed Project site would be the stations located at Lancaster, Mojave, Victorville, and Barstow. The background values represent the highest values reported for any site during any single year of the most recent 3-year period (2006, 2007, and 2008 at the time of writing) per MDAQMD guidance and are consistent with MDAQMD's Final Determination of Compliance.

Source: CEC AFC 2009; CEC SSA 2010,;MDAQMD 2010

The surface meteorological data processed for the ARMS/EPA Regulatory Model was 4 recent years (2001–2004) of Automated Surface Observing System data from Daggett Airport (located approximately 50 kilometers east-southeast from the project site). The Automated Surface Observing System data were downloaded from the National Climatic Data Center (NCDC) website in CD-3505 format, converted to SAMSON format using the Russ Lee freeware program NCDC-CNV (which also interpolates missing data in accordance with USEPA procedures), and then combined with upper-air data from Desert Rock (downloaded from the National Oceanic and Atmospheric Administration [NOAA] website) for the same time period. As part of the AERMET input requirements, Albedo, Bowen Ratio, and Surface Roughness must be classified by season. These values were determined with the AERSURFACE using the latest USEPA guidance (i.e., ARMS/EPA Regulatory Model Implementation Guide, revised March 19, 2009, and the AERSURFACE User's Guide, USEPA-454/B-08-001).

Receptor and source base elevations were determined from the USGS Digital Elevation Model (DEM) data using the 7.5-minute format data (10-meter spacing between grid nodes). All coordinates were referenced to UTM North American Datum 1927 (NAD27), Zone 11. The receptor locations and elevations from the DEM files were placed exactly on the DEM nodes for regular receptor grids and AERMAP was used to interpolate fence line receptor elevations. Every effort was made to maintain receptor spacing across DEM file boundaries. Cartesian coordinate receptor grids are used to provide adequate spatial coverage surrounding the project area for assessing ground-level pollution concentrations, to identify the extent of significant impacts, and to identify maximum impact locations. The receptor grids used in this analysis are as follows:

- 50-meter resolution receptor grid extending outward 500 meters from the AMSP/Lockhart Substation fence line in all directions. This is called the downwash grid. In addition, receptors were placed at approximate 50-meter intervals along the property fence line.
- 100-meter resolution receptor grid extending outward from the edge of the downwash grid to 1,200 to 1,500 meters or more from the AMSP/Lockhart Substation fence line in all directions. This is referred to as the intermediate grid.
- 200-meter resolution receptor grid extending outwards, from the edge of the intermediate grid to 10 kilometers from the center of the AMSP/Lockhart Substation in all directions. This is referred to as the coarse grid.
- 50-meter resolution around any location on the coarse or intermediate grids where a maximum impact is modeled above the concentrations on the downwash grid. This is referred to as a refined grid. All overall maximum impacts occurred on the fence line or in the downwash receptor grid, so no refined receptor grids were required.

Concentrations within the facility fence line were not calculated. Two public roadways traverse the overall AMSP/Lockhart Substation property, which are considered in the analysis by modeling receptors along the property fence line on each side of the public roadways (i.e., the AMSP/Lockhart Substation actually consists of three separate fenced areas). Receptor locations and DEM receptor data were input into AERMAP (version 09040) to calculate receptor heights and hill height scales per USEPA guidance. Since maximum impacts due to fugitive emissions from construction activities are expected to occur at or near the property boundary, only the 50-meter spaced downwash and fence line receptor grids were used for modeling construction impacts.

To determine the construction impacts on ambient standards (i.e., 1-hour through annual) it was assumed that the emissions would occur during a daily construction schedule of 10-hour days (7 a.m. to 5 p.m.). The predicted proposed Project concentration levels were added to a conservatively estimated background of existing emission concentration levels to determine total concentrations. The results of the modeling analysis are presented in Table 3.3-7. The construction modeling analysis includes both the onsite fugitive dust and offsite vehicle tailpipe emission sources, including control measures.

The modeling analysis indicates that, with the exception of 24-hour and annual PM_{10} impacts, the AMSP would not create new exceedances or contribute to existing exceedances for any of the modeled air pollutants. The AMSP/Lockhart Substation site is located in an area with high PM_{10} background concentrations. Additionally, the worst-case predicted PM_{10} impacts occur at the fence line and drop off quickly with distance from the fence line. All maximum impacts occur at the fence line or in the downwash receptor grid. The modeling results show that project impacts reduce by approximately 20% within the downwash grid (500 meters from the fence line). However, there are a few residences located adjacent to, or nearby, the proposed

AMSP fence line. The nearest residence is approximately 60 feet south of the southern boundary. Project emissions present the potential for nuisance dust conditions to occur within 0.25 mile of the earth-moving activities. A Condition of Certification for the AMSP (AQ-SC9 as detailed in the next section) includes the provision that the Applicant, at the residents' request, would pay for equivalent lodging for these residents during the initial grading phase of construction when the maximum particulate impacts from the proposed AMSP construction could occur at each of the residential locations located within 0.25 mile of the AMSP fence line. Background levels of the nonattainment 24-hour and annual PM_{10} are already substantially above the NAAQS and constitute the predominant source of the calculated exceedances. The contribution from construction sources would be intermittent and temporary. As Table 3.3-7 shows, the project's incremental contribution to the total impact is significantly lower than the background concentration itself and PM_{10} concentrations in the area would exceed the NAAQS even without these emissions. The background concentration is approximately three times the state 24-hour standard. Additionally, the contribution of the project's emissions would cease at the end of the construction period.

Because of the known relationship of NO_X and VOC emissions to ozone formation, it can be said that the emissions of NO_X and VOCs from AMSP construction do have the potential (if left unmitigated) to contribute to ozone levels in the region. CEC's analysis concluded that incorporation of Conditions of Certification AQ-SC1 to AQ-SC5 for the AMSP would mitigate this potential impact. The proposed AMSP would also have indirect emission reductions associated with the reduction of fossil-fuel-fired power plant emissions due to the project displacing the need for their operation. Additionally, CEC concluded that, with implementation of staff recommended mitigation measures, described in the Conditions of Certification, the project would comply with all federal, State, and local air quality regulations and would not result in an air quality impact. These conditions, listed in Appendix S, are hereby incorporated into this EA analysis as being part of the proposed Project. The MDAQMD conditions for the AMSP portion of the proposed Project are included in Appendix I.

Operational Emissions

Operational emissions associated with the proposed Project would primarily be from AMSP operation. Operation of the AMSP will result in emissions of criteria air pollutants from onsite sources such as the proposed auxiliary boilers, fire pumps, emergency generator engines, and cooling towers, and fugitive losses from the HTF system; and mobile source emissions from AMSP-generated traffic. Criteria pollutant emissions will consist primarily of VOCs, NO_x, CO, SO_2, PM_{10}, and $PM_{2.5.}$ Operational emissions from the substation, transmission lines, and fiber-optic lines are anticipated to be negligible, as the constructed substation emissions would be limited to emergency generators and occasional maintenance, as with installed transmission and fiber-optic lines. Table 3.3-8 shows the estimated facility emissions for operation of the AMSP.

Table 3.3-8: Summary of Facility Operation Emissions for the AMSP

Source	Air Pollutant Emissions (tons/year)					
	VOCs	**NO_X**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Onsite Emissions	13.22	4.64	3.08	0.03	32.21	17.54
Mobile Source Emissions	0.60	0.91	7.02	0.01	0.07	0.07
Total Emissions	13.82	5.55	10.1	0.04	32.28	17.61
De Minimis Levels	*100*	*100*	–	–	*100*	–
MDAQMD Significant Emissions Thresholds[1]	*25*	*25*	*100*	*25*	*15*	*15*

[1] MDAQMD recommends the use of the daily thresholds for projects with phases (construction and operational) shorter than 1 year. Since construction activities for the AMSP would last for 26-31 months followed by operation, MDAQMD's annual significance thresholds were used.

Source: CEC AFC 2009; CEC SSA 2010. See Appendix I for detailed emissions data.

MDAQMD released its Final Determination of Compliance on May 13, 2010, stating that the project is expected to comply with applicable Air District rules, which incorporate state and federal requirements. MDAQMD issued a revised Final Determination of Compliance dated July 1, 2010, with revised permit conditions. MDAQMD concluded that since the background PM_{10} concentrations are substantially in excess of the CAAQS without the project and the new facility will not be a major stationary source per MDAQMD New Source Review (NSR) Regulation XIII for any criteria pollutant, the project will comply with all applicable MDAQMD Rules and Regulations. In addition, the proposed AMSP facility would not be required to obtain offsets pursuant to MDAQMD Rule 1303. The AMSP would not trigger the Prevention of Significant Deterioration program requirements; therefore, a Prevention of Significant Deterioration increment analysis protocol is not required. The proposed Project would also comply with all BACT requirements of MDAQMD.

The Applicant proposes the following emission controls on the stationary equipment associated with AMSP operation. Specific operational parameters for these measures are provided in Appendix I.

Auxiliary HTF Heaters

The Applicant's proposed BACT for the two auxiliary HTF heaters would include the use of natural gas (clean fuel) and the use of ultra-low NO_X burners (for NO_X).

Emergency Generator Engines

The Applicant's proposed BACT for the emergency generator engines is compliance with the New Source Performance Standards (NSPS), Subpart IIII Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, specifically NSPS-compliant engines. To meet this requirement the Applicant is proposing Tier 2 compliant engines.

Fire Water Pump Engine

The Applicant's proposed BACT for the fire pump engines is compliance with NSPS, Subpart IIII Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, specifically NSPS-compliant engines. To meet this requirement the Applicant is proposing Tier 3 compliant engines.

Cooling Tower

The Applicant's proposed BACT for the cooling tower is the use of a high-efficiency drift eliminator with a guaranteed drift efficiency of 0.0005%. The Applicant would also limit the recirculating water TDS content to 9,968 parts per million (ppm).

HTF System Emissions

The Applicant's proposed BACT for the HTF Tank Venting System Emissions consists of the following, which would control total HTF-related potential organic compound emissions by 99.9%:

- Nitrogen blankets on the HTF storage tanks
- Distillation/condensation of the HTF expansion system, the high boilers, and the low boilers (primarily benzene and phenol)

Additional assumed mitigation measures to reduce emissions from the HTF piping system and waste load out include the following:

- Daily inspections of the tanks and distribution system for the presence of leaks in the areas of valves, flanges, and pump seals
- Continuous maintenance of the system
- Proper handling of HTF during delivery, transfer to the system, and waste disposal

Maintenance Vehicles

The Applicant has not proposed any specific emission controls for this emission source.

Fugitive Dust

The Applicant has proposed to control fugitive dust emissions during operation through the use of wind erosion operational practices such as windbreaks, water, and dust suppressants in areas disturbed by vehicles or wind and by limiting vehicle speeds.

MDAQMD and CEC staff concurred that the AMSP's stationary source proposed emission controls/emission levels for criteria pollutants meet BACT requirements and that the proposed stationary source emission levels are reduced to the lowest technically feasible levels. Additionally, Condition of Certification AQ-SC6, included in Section 3.3.5.1.1, requires the AMSP owner to purchase new on-road and off-road vehicles that meet California emissions standards and AQ-SC7 requires the AMSP owner to apply fugitive dust controls that are equivalent to those recommended for construction to adequately mitigate the proposed Project's operation emissions. Condition of Certification AQ-SC8, included in Section 3.3.5.1.1, ensures that the CEC license is amended, as necessary, to incorporate any changes to the air quality permits.

General Conformity Analysis

As shown in Table 3.3-8, the estimated annual emissions of VOCs, NO_X, and PM_{10} for the proposed Project would be less than the annual *de minimis* levels. It is concluded that the proposed Project would conform to the SIP, and a formal conformity determination would not be required.

Criteria Air Pollutant Analysis

As Table 3.3-8 shows, the estimated annual emissions of VOCs, NO_X, CO, and SO_2 would be less than MDAQMD's annual significant emissions thresholds (drawn upon here as a comparative yardstick); on that basis their impact can be regarded as small. This is consistent with the associated air pollutant concentration estimates of NO_2, CO, and SO_2 shown in Table 3.3-9 discussed shortly below. $PM_{2.5}$ annual emissions are just above a yardstick of an MDAQMD annual significant emissions threshold, but their impact can be considered small, consistent with the low air concentration estimate shown in Table 3.3-9. PM_{10} annual emissions are approximately double this MDAQMD yardstick. The impacts of these emissions on PM_{10} air pollutant concentrations are discussed below.

Using estimated peak onsite hourly, daily, and annual operating emissions, the AMSP's operational emissions were modeled using the same methodology as described under construction emissions to determine impacts in the AMSP air quality analysis. The predicted concentration levels were added to a conservatively estimated background of existing emission concentration levels to determine the total effect. USEPA's ARMS/EPA Regulatory Model was used to estimate pollutant concentrations, using the same meteorological data and receptor points as described in the construction analysis above. For this project, the meteorological data used as inputs to the model included hourly wind speeds and directions measured at the Daggett Airport meteorological site during 2001 through 2004, which is the closest complete meteorological data source to the project site. Concurrent upper air data from Desert Rock and Nevada were also used. These meteorological data were approved for use by the MDAQMD. The same receptors as used in the construction analysis, consisting of fence line, downwash, intermediate, and coarse grids were used.

Table 3.3-9: Maximum Project Operation Air Pollutant Concentrations

Pollutants	Averaging Period	Impacts (μg/m³)	Background (μg/m³)	Total Impact (μg/m³)	State Standard (μg/m³)	National Standard (ug/m³)	Incremental Contribution of Project
NO_2	1-hour	130	154	284	339	-	46%
	1-hour federal	–	–	184.3[a]	--	188	–%
	Annual	0.18	42	42.2	57	100	0.4%
PM_{10}	24-hour	8.8	154	162.8	50	150	5%
	Annual	2.3	38.4	40.7	20		6%
$PM_{2.5}$	24-hour	4.4	28.0	32.4	--	35	14%
	Annual	0.7	10.4	11.1	12	15.0	6%
CO	1-hour	76	4,025	4,101	23,000	40,000	2%
	8-hour	7.8	1,789	1,797	10,000	10,000	0.4%
SO_2	1-hour	0.25	94	94.3	665	-	0.3%
	3-hour	0.18	23	23.2	--	1,300	0.8%
	24-hour	0.07	13	13.1	105	365	0.5%
	Annual	0.003	3	3.0	--	80	0.1%

[a] The modeling results for the new federal standard includes actual hourly background so only the total maximum impact determined as the maximum 3-year average of the 98th percentile of daily maximums is presented.
Source: CEC AFC 2009; CEC SSA 2010.

Table 3.3-9 presents the results of the modeling analysis. It should be noted that the determined maximum 1-hour NO_2 concentration assumes all NO_X emissions to be NO_2. The operational modeling analysis includes emissions from the stationary sources, onsite fugitive dust, and vehicle tailpipe emission sources, as summarized in Table 3.3-8.

The modeling analysis indicates that, with the exception of CAAQS 24-hour and CAAQS annual PM_{10} exceedances, the proposed Project would not create new exceedances or contribute to existing exceedances for any of the modeled air pollutants. The AMSP/Lockhart Substation site (and the whole proposed Project for that matter) is located in a region with high background concentrations of PM_{10} that already exceed the state standard. The contribution of the proposed Project's emissions to the total 24-hour PM_{10} impact is only 5%; that is, 95% of the impact is due to high background concentrations. The 24-hour PM_{10} background concentration is three times the CAAQS by itself. As Table 3.3-7 shows, the project's incremental contribution to the total impact is significantly lower than the background concentration itself and PM_{10} concentrations in the area would exceed the NAAQS even without these emissions. Additionally, the worst-case PM_{10} impacts occur at the AMSP fence line and drop off quickly with distance from the AMSP fence line. All maximum impacts occur at the fence line or in the downwash receptor grid. The modeling results show that project impacts reduce by approximately 20% within the downwash grid (500 meters from the fence line). Incorporation of CEC Conditions of Certification and MDAQMD BACT requirements would further reduce the project's contribution to PM_{10} concentrations.

The project has been independently evaluated by both CEC and MDAQMD. CEC concluded that the AMSP will conform with all applicable LORS relating to air quality. Implementation of the mitigation measures described in the record and contained in the Conditions of Certification ensures that the project will not result in significant direct, indirect, or cumulative air quality impacts in conformance with NEPA and CEQA requirements.

MDAQMD released its Final Determination of Compliance on May 13, 2010, stating that the project is expected to comply with applicable Air District rules, which incorporate state and federal requirements. MDAQMD issued a revised Final Determination of Compliance dated July 1, 2010, with revised permit conditions. MDAQMD concluded that since the background PM_{10} concentrations are substantially in excess of the CAAQS without the project and the new facility will not be a major stationary source per MDAQMD NSR Regulation XIII for any criteria pollutant, the project will comply with all applicable MDAQMD Rules and Regulations. In addition, the proposed AMSP facility would not be required to obtain offsets pursuant to MDAQMD Rule 1303. Detailed emissions data on the proposed facility are included in the Air Quality Analysis for the CEC AFC. The AMSP would not trigger the Prevention of Significant Deterioration program requirements; therefore, a Prevention of Significant Deterioration increment analysis protocol is not required. The proposed Project would also comply with all BACT requirements of MDAQMD. Compliance with the District's new source review requirements would ensure that the proposed project would be consistent with the strategies and future emissions anticipated under the District's air quality attainment and maintenance plans. MDAQMD's Final Determination of Compliance amounts to their approval of the project's permit application. Thus, MDAQMD has independently reviewed the project's emissions and has concluded that it meets all their regulations.

In addition, renewable energy facilities, such as the proposed AMSP, are needed to meet California's mandated renewable energy goals. While there are no local area air quality public benefits resulting from the proposed Project, it would indirectly reduce criteria pollutant emissions within the southwestern United States by reducing fossil fuel fired generation. The project site has served as an agricultural and cattle center for over 60 years. Currently, no ranching or residential activities are on the property, and only one active pivot irrigation field is in production on the site. The site currently is a source of fugitive dust emissions and contributes to the background PM_{10} concentrations in the area. Operation of the proposed Project and implementation of the specified mitigation measures and Conditions of Certification would provide better control of fugitive dust onsite than is currently occurring. Thus, the project would help offset some of the PM_{10} contribution from the current site.

MDAQMD is currently classified as nonattainment for the state and the federal 24-hour PM_{10} air quality standard. MDAQMD first adopted a federal Particulate Matter Attainment Plan in July 31, 1995. Currently, the vast majority of air districts in the state are designated nonattainment of the state PM_{10} standard. There is no legal requirement for air districts to provide plans to attain the state PM_{10} standard, so air districts have not developed such plans. The Particulate Matter Attainment Plan states that "(t)he air quality of the MDAQMD is impacted by both fugitive dust from local sources and occasionally by regionwide windblown dust during moderate to high wind episodes. This regionwide or ‘regional’ event includes contributions from both local and distant dust sources which frequently result in violations of the NAAQS that are multi-district and interstate in scope.” It also states that “(i)t is not feasible to implement control measures to reduce dust from regional wind events.” Therefore, the MDAQMD would have put considerable effort to reduce the emissions from “…unpaved road travel, construction, and local disturbed areas in the populated areas, and certain stationary sources operating in the rural Lucerne Valley.”

As a solar power generation facility, the direct air pollutant emissions from power generation are negligible and the emission source would be limited to auxiliary equipment and maintenance activities. The emissions from the proposed AMSP would be minimal compared to the other power generation facilities, and it is unlikely that the proposed Project would measurably contribute to ongoing air basin PM_{10} nonattainment exceedance events considering impacts from other sources.

Local Emissions Analysis

Carbon Monoxide

Vehicle traffic emissions can occasionally result in localized air quality impacts. Severe vehicle congestion at major signalized intersections can generate elevated CO levels, called “hotspots,” that may be hazardous to human receptors adjacent to the intersection. Severe congestion is determined by analysis of roadway and intersection traffic levels. Localized CO impacts are typically of concern at signalized intersections of unacceptable service levels, according to the *Transportation Project-level Carbon Monoxide Protocol* (the Protocol) (UCD ITS 1997). The Protocol provides a methodology for determining the level of analysis required on a project to comply with the CAA, federal and state conformity rules, and NEPA.

The MDAB is designated as a CO attainment area. Therefore, in accordance with the Protocol, only projects that are likely to worsen traffic conditions at signalized intersections rated at level of service (LOS) E or F need further examination for localized CO impacts. The proposed Project would not worsen traffic flow at study intersections. The CEC AFC included a traffic impact analysis that evaluated the impacts of construction and operational traffic generated by the AMSP (CEC AFC 2009). The analysis concluded study intersections would operate at an acceptable LOS (LOS D or better) during the construction and operations phases. The AMSP was projected to generate the highest amount of traffic during the construction phase. The AFC reported that, during the peak month, the estimated number of construction workers needed would be 1,162 workers per day. During the operation and maintenance phase, the AMSP is expected to generate a maximum of 52 trips during the peak hours and a maximum of 250 trips per day. The AMSP is expected to generate 38 truck trips per month, mostly during off-peak traffic times. In contrast, the other proposed Project components (i.e., Lockhart Substation, interconnection, and fiber-optic lines) would require a considerably lower number of construction workers, estimated at approximately 14 construction personnel on any given day. Operational and maintenance activities associated with the substation, transmission lines, and telecommunication system would be minimal as compared to the AMSP. Thus, cumulative construction and operational traffic associated with the proposed Project would not worsen traffic conditions at study intersections. Therefore, implementation of the proposed Project would not create a CO hotspot at any intersection and no substantial CO-related adverse impact would occur.

Hazardous Air Pollutants

Construction-related Emissions

Construction activities associated with the proposed Project would result in short-term emissions of diesel exhaust from heavy-duty construction equipment. Emissions of particulate exhaust from diesel-fueled engines (diesel PM) were identified as a hazardous air pollutant[5] by CARB in 1998. Construction activities would result in the generation of diesel PM emissions from the use of off-road diesel equipment required for site grading and excavation, paving, and other construction activities. According to CARB, the potential cancer risk from the inhalation of diesel PM, which is discussed below, outweighs the potential noncancer health impacts (CARB 2003[t1]).[em2]

Construction of the proposed Project, including AMSP site preparation, is anticipated to take place over a period of 26 months. As noted earlier, assessment of chronic (long-term) health effects assumes continuous exposure to toxic substances over a significantly longer time period, typically from 8 to 70 years. An HRA was conducted for diesel PM from construction equipment emissions as part of the CEC AFC process. The modeling of worst-case construction emissions adjusted to a 26-month period (lifetime exposure adjustment factor of 0.0106) found that the cancer risk was estimated to be 2.54 in one million at the maximum impact receptor, below the level of significance (10 in one million). The chronic hazard index was found to be 0.055 at the maximum impact receptor, below the level of significance of 1.0. The acute hazard index was not reported since available data in support of a value were deemed insufficient. Thus, no adverse impacts would occur due to hazardous air pollutant emissions during project construction.

Operations-Related Emissions

The proposed Project could lead to operational emissions of hazardous air pollutants. The Proposed Action triggers implementation of the AMSP, substation, transmission lines, and telecommunication system. Of all the project components, only operation of the AMSP would generate hazardous air pollutants and could expose sensitive receptors to hazardous air pollutant emissions. Implementation of the other project components, i.e., the substation, transmission lines, and telecommunication system, would not result in a substantial increase of long-term operation-related emissions. Specifically, the long-term operation of these project components would only require periodic maintenance trips. Furthermore, implementation of

[5] Referred to as toxic air contaminant (TAC) by CARB.

these components would not result in the operation of any new major stationary emission sources. The human health risks potentially associated with operational hazardous air pollutant emissions from AMSP boilers, diesel engines, cooling towers, and HTF fugitives were evaluated in a health risk assessment (HRA). The HRA was prepared using guidelines developed by the Office of Environmental Health Hazard Assessment and CARB, as implemented in the latest version of the Hotspots Analysis and Reporting Program model (Version 1.4a).

Emissions of hazardous air pollutants associated with operation of the AMSP were estimated using emission factors approved by CARB and USEPA. Hazardous air pollutant concentrations were estimated using the Hotspots Analysis and Reporting Program dispersion modeling module. Modeling allows the estimation of both short-term and long-term average concentrations in air for use in an HRA, accounting for site-specific terrain and meteorological conditions. Health risks potentially associated with the estimated concentrations of pollutants in air were characterized in terms of excess lifetime cancer risks (for carcinogenic substances), or comparison with reference exposure levels for noncancer health effects (for noncarcinogenic substances). A reference exposure level is a concentration in air at or below which no adverse health effects are anticipated.

Health risks were evaluated for a hypothetical maximum exposed individual located at the maximum impact receptor. The hypothetical maximum exposed individual is an individual assumed to be located at the maximum impact receptor location, which is a residential receptor where the highest concentrations of air pollutants associated with AMSP emissions are predicted to occur, based on the air dispersion modeling. Human health risks associated with emissions from the AMSP are unlikely to be higher at any other location than at the location of the maximum impact receptor. If there is no significant impact associated with concentrations in air at the maximum impact receptor location, it is unlikely that there would be significant impacts in any location in the vicinity of the AMSP. The highest concentration location represents the maximum impact receptor.

The excess lifetime cancer risk associated with concentrations in air estimated for the AMSP maximum impact receptor location is estimated to be 6.85×10^{-6}. Excess lifetime cancer risks less than 10×10^{-6} (with T-BACT) are unlikely to represent significant public health impacts that require additional controls of facility emissions, based on MDAQMD guidance. The acute and chronic noncancer hazard quotients associated with concentrations in air were estimated to be 0.0087 and 0.00992, respectively. The acute and chronic noncancer hazard quotients for all target organs fall below 1.0. A hazard quotient less than 1.0 is unlikely to represent a significant impact to public health, per MDAQMD guidance. Further description of the methodology used to calculate health risks associated with emissions to the air is presented in Appendix I.

Thus, the proposed Project would not expose sensitive receptors to substantial pollutant concentrations, including those resulting in a cancer risk greater than or equal to 10 in a million and a hazard index greater than 1. No adverse impacts would occur.

3.3.5.1.1 AMSP and Lockhart Substation

Construction Emissions

Construction-related emissions for the AMSP are based on the following information:

- The site total acreage is 1,778, with total facility acreage inside the proposed fence line of 1,632. The maximum acreage to be disturbed in any single day or month is 200 acres.
- Moderate site preparation will be required prior to construction of the array fields, power blocks, control building foundations, support structures, and other project features.
- Construction activity is expected to last for a total of 26 months.

Construction-related issues and emissions at the AMSP/Lockhart Substation site would be consistent with issues and emissions encountered at any construction site. Compliance with the provisions of the following permits will generally result in minimal site emissions: (1) grading permit, (2) Storm Water Pollution Prevention Plan (SWPPP) requirements (construction site provisions), (3) use permit, (4) building permits, and (5) the MDAQMD ATC permit, which will require compliance with the provisions of all applicable fugitive dust rules that pertain to the site construction phase. An analysis of construction site emissions is presented below. In addition, construction activities for the AMSP would incorporate all control measures described in Section 3.3.5.1 and CEC Conditions of Certification, listed in Appendix S. Table 3.3-10 shows the construction emissions associated with the AMSP construction.

Table 3.3-10: Estimated Annual Construction Emissions – AMSP

Source	Air Pollutant Emissions (tons/year)					
	VOCs	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
AMSP	17.1	88.6	99.3	0.2	19.8	7.8

Source: CEC AFC 2009; CEC SSA 2010. See Appendix I for detailed construction emissions data.

Emissions associated with construction of the Lockhart Substation and associated transmission lines were estimated using URBEMIS. It was assumed that construction activities for the substation would occur concurrently with AMSP construction because it would be located within the boundaries of the AMSP, and the grading of the substation site would be included within the overall grading design. Also, land disturbance areas and earth-moving quantities, including vehicle emissions at the substation location, are included within the AMSP facilities emissions shown in Table 3.3-10. Construction activities associated with the 220-kV transmission line would consist of receiving and handling of construction materials, rehabilitation of existing and creation of new access roads for construction activities, site preparation, assembly and erection of structures, removal of existing structure(s), stringing of conductors, and site cleanup. Emissions for reconstruction and relocation of 33-kV and 12-kV distribution systems are also included in the analysis. Land disturbance for distribution system construction activities would be primarily within the already disturbed AMSP and included in the AMSP's disturbance area. Table 3.3-11 shows annual construction emissions for the substation and transmission lines construction.

Table 3.3-11: Estimated Annual Construction Emissions – Lockhart Substation and Associated Transmission Lines

Source	Air Pollutant Emissions (tons/year)					
	VOCs	NO_X[1]	CO	SO_2	PM_{10}	$PM_{2.5}$
Lockhart Substation	0.46	1.83	5.29	0.01	0.21	0.17
Transmission Lines	0.36	1.50	2.49	0.00	0.52	0.19

[1] NO_X emissions include average percent reductions from use of Tier II construction equipment, which is a control measure for the project (SCAQMD 2010).

Source: Data modeled by AECOM 2010; see Appendix I for detailed construction emissions data

Conditions of Certification

CEC recommended construction PM_{10} and NO_X emission mitigation measures as articulated in Conditions of Certification AQ-SC1 through AQ-SC5. In particular, staff propose unpaved road fugitive dust controls necessary to control the higher fugitive dust emission potential for this type of project, and modifications to the off-road equipment mitigation measure to update it to current staff standards that consider the high unmitigated emission potential for the construction of this project. AQ-SC1 requires the applicant to have an onsite construction mitigation manager who would be responsible for the implementation and compliance of the construction mitigation program. The documentation of the ongoing implementation and compliance with the construction mitigation program would be provided in the monthly construction compliance report that is required in the staff's recommended Condition of Certification AQ-SC2. (Refer to Appendix S for complete listing of measures.)

Condition of Certification AQ-SC3 formalizes the fugitive dust control requirements. These requirements include paving of the main access road to the main power block before construction begins on that part of the site, that durable nontoxic soil stabilizers be used on the onsite unpaved plant roads as soon as they are constructed, and many other activity-specific control measures be applied to reduce fugitive dust emissions during construction.

Condition of Certification AQ-SC4 would limit the potential offsite impacts from visible dust emissions, by responding to situations when the control measures required by AQ-SC3 are not working effectively to control fugitive dust from leaving the construction site area.

Condition of Certification AQ-SC5 would mitigate the PM and NO_X emissions from the large diesel-fueled construction equipment. Implementation of this mitigation measure would provide additional primary and secondary PM mitigation to supplement the recommended fugitive dust mitigation measures. This condition requires the use of EPA/ARB Tier 3 engine-compliant equipment for equipment over 50 and under 750 horsepower where available based on a good faith effort to find and use available EPA/ARB Tier 3 engines, and requires that all engines over 750 horsepower comply with Tier 2 emission standards. This condition also includes equipment idle time restrictions and engine maintenance provisions.

CEC concluded that a solar renewable project, which would have a 30-year life in a setting likely to continue to be impacted by both local and upwind emission sources, should address its contribution to the potentially ongoing nonattainment of the PM_{10} and ozone standards. CEC recommended that mitigation measures be required to reduce the nonstationary emissions from the AMSP. Therefore, the project owner is required to purchase new on-road and off-road vehicles that meet California emissions standards (AQ-SC6) and that the project owner be required to apply fugitive dust controls equivalent to those recommended for construction (AQ-SC7) to adequately mitigate the proposed AMSP's operation emissions.

Condition of Certification AQ-SC8 is required to ensure that the CEC license is amended, as necessary, to incorporate changes to the air quality permits.

Condition of Certification AQ-SC9 states that the applicant be responsible for paying for offsite lodging, if requested, during initial site grading for residents located within one quarter mile of the proposed AMSP/Lockhart Substation site fence line. This recommended condition is considered necessary to mitigate the potential particulate nuisance conditions that could exist near the proposed AMSP/Lockhart Substation site fence line during the initial grading activities. This condition of certification is being included considering the specific conditions and construction requirements for the AMSP. These specific conditions and construction requirements include the following:

- Several residences are located adjacent to or within one-quarter mile of the site fence line.
- The site grading/preparation phase of construction includes up to 5 million cubic yards of earthmoving, including the creation of a large earthen drainage channel near residences.
- The project site is in an area that is windy and dry, which creates additional dust control challenges for a large project site.

The complete list of CEC Conditions of Certification is available in Appendix S.

An analysis of cumulative construction emissions for the proposed Project is presented in Chapter 4.

Operational Emissions

Operation of the AMSP will result in emissions of criteria air pollutants from the proposed auxiliary boilers, fire pumps, emergency generator engines, and cooling towers, and fugitive losses from the HTF system. Criteria pollutant emissions will consist primarily of VOCs, NO_x, CO,

SO_2, PM_{10}, and $PM_{2.5.}$ Operational emissions from the substation and transmission lines are anticipated to be negligible, as the constructed substation emissions would be limited to emergency generators and occasional maintenance, as with installed transmission lines. SCE would conduct operation, inspection, and maintenance activities at least once a year. The frequency of inspection and maintenance activities would depend upon weather effects and variables such as substantial storm damage or vandalism. Table 3.3-12 shows the estimated facility emissions for the AMSP and Lockhart Substation.

Table 3.3-12: Summary of Facility Emissions for the Project – AMSP and Lockhart Substation

Source	Air Pollutant Emissions (tons/year)					
	VOCs	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Onsite Emissions	13.22	4.64	3.08	0.03	32.21	17.54
Mobile Source Emissions	0.60	0.91	7.02	0.01	0.07	0.07
Total Emissions	13.82	5.55	10.1	0.04	32.28	17.61

Source: CEC AFC 2009; CEC SSA 2010. See Appendix I for detailed emissions data.

As noted previously, operation of the AMSP would not result in an adverse impact on air quality in the region, with the inclusion of control measures and Conditions of Certification. In addition, the proposed solar facility would not be required to obtain offsets pursuant to MDAQMD Rule 1303. Based on the values in Table 3.3-12, the new facility would not be a major stationary source per MDAQMD NSR Regulation XIII for any criteria pollutant. Detailed emissions data on the proposed facility are included in Appendix I. The AMSP/Lockhart Substation would also comply with all BACT requirements of MDAQMD. Detailed emissions data for the proposed facility are presented in Appendix I.

Local Emissions Analysis

Carbon Monoxide

Vehicle traffic emissions can occasionally result in localized air quality impacts. Severe vehicle congestion at major signalized intersections can generate elevated CO levels, called “hotspots,” that may be hazardous to human receptors adjacent to the intersection. Severe congestion is determined by roadway and intersection traffic LOS analysis. Localized CO impacts are typically of concern at signalized intersections of unacceptable LOS, according to the Protocol (UCD ITS 1997). The Protocol provides a methodology for determining the level of analysis required on a project to comply with the CAA, federal and state conformity rules, and NEPA.

The MDAB is designated as a CO attainment area. Therefore, in accordance with the Protocol, only projects that are likely to worsen traffic conditions at signalized intersections rated at LOS E or F need be further examined for localized CO impacts. The proposed Project would not worsen traffic flow at study intersections. Study intersections would operate at an acceptable LOS during project construction and operation (CEC 2010a). The substation would contribute minimal traffic to the study intersections. Therefore, implementation of the proposed Project would not create a CO hotspot at any intersection and no substantial CO-related adverse impact would occur.

Hazardous Air Pollutants

Construction-Related Emissions

Construction activities associated with the AMSP/Lockhart Substation would result in short-term emissions of diesel exhaust from heavy-duty construction equipment. Emissions of particulate exhaust from diesel-fueled engines (diesel PM) were identified as a hazardous air pollutant by CARB in 1998. Construction activities would result in the generation of diesel PM emissions from the use of off-road diesel equipment required for site grading and excavation, paving, and other construction activities.

As described in the construction emissions analysis above, the AMSP represents the primary source of diesel PM emissions associated with construction of the proposed Project. The AMSP would not expose sensitive receptors to substantial pollutant concentrations, including those resulting in a cancer risk greater than or equal to 10 in a million and hazard index greater than 1. As construction of these smaller support facilities would result in construction emissions of diesel PM that are much less than the construction emissions associated with the main site, no adverse impacts would be expected to occur.

Operations-Related Emissions

Operation of the AMSP could expose sensitive receptors to hazardous air pollutant emissions. The human health risks potentially associated with operational hazardous air pollutant emissions from AMSP boilers, diesel engines, cooling towers, and HTF fugitives were evaluated in an HRA. As described above, the AMSP represents the primary source of hazardous air pollutants associated with operation of the proposed Project. The AMSP would not expose sensitive receptors to substantial pollutant concentrations, including those resulting in a cancer risk greater than or equal to 10 in a million and hazard index greater than 1. No adverse impacts would occur.

3.3.5.1.2 Telecommunication System

Construction Emissions

Emissions associated with construction of the telecommunication system were estimated using URBEMIS. It was assumed that construction activities would occur concurrently with AMSP and Lockhart Substation construction. Certain portions of the fiber-optic cable would be constructed on existing overhead distribution and transmission wood and light-duty steel poles, while other portions of the cable would be constructed on new overhead structures (i.e., seven replacement poles and 30 new interset[6] poles) and newly constructed underground conduit system(s). In addition, construction activities would incorporate applicable control measures summarized in Section 3.3.5.1 and listed in Appendix S. Table 3.3-13 shows annual construction emissions for the substation and transmission lines construction.

Table 3.3-13: Estimated Annual Construction Emissions – Telecommunication System

Source	Air Pollutant Emissions (tons/year)					
	VOCs	NO_X[1]	CO	SO_2	PM_{10}	$PM_{2.5}$
Telecommunication System	0.33	1.36	1.84	0.00	0.86	0.27

[1] NO_X emissions include average percent reductions from use of Tier II construction equipment, which is a control measure for the proposed Project (SCAQMD 2010).
Source: Data modeled by AECOM 2010.

Operational Emissions

Operational emissions from the telecommunication system are anticipated to be negligible, as the emissions would be limited to occasional maintenance activities. No adverse impacts would occur.

Local Emissions Analysis

Carbon Monoxide

Traffic generated by the telecommunication system would primarily be temporary, short-term construction traffic. Traffic from the telecommunication system operations would be negligible since fiber-optic cables would only require periodic maintenance. The telecommunication system would not add new vehicle trips to the roadway system. Therefore, traffic is not anticipated to be substantial enough to result in increasing delays at intersections. The AMSP is projected to generate substantially more construction traffic than the telecommunication system (e.g., 1,162 construction workers per day and 250 operational trips per day), and its traffic impacts were found to be less than significant. Therefore, construction and operation of the telecommunication system would not have the potential to result in localized CO impacts.

Hazardous Air Pollutants

Construction-Related Emissions

As previously stated, construction activities would result in the generation of diesel PM emissions from the use of off-road diesel equipment required for new pole foundation grading and fiber-optic trench excavation, paving, and other construction activities. The primary concern for diesel PM is sensitive receptors in proximity to high concentrations of diesel vehicle

[6] Poles placed between existing poles.

operation, such as construction sites, interstate highways, distribution centers, bus stations, or port facilities. The linear construction areas (i.e., fiber-optic line corridors) cover an extensive corridor area along roadways. However, a substantial use of diesel equipment and vehicles is not anticipated along these routes. There are sensitive receptors such as residential recreational areas in proximity to the proposed alignments. However, fiber-optic line installation would be temporary and short term (approximately 26 months) and of short duration in one location (1 to 2 days), and would cease after construction is completed. Mobile equipment would progress along the corridor and would not operate near (within approximately 500 feet) any one receptor for more than 1 or 2 days at a time. Construction of the telecommunication system would represent less than 5% of the 70-year exposure period for any nearby sensitive receptor in the area. Thus, because the use of mobilized equipment would be temporary in combination with the dispersive properties of diesel PM, construction-related hazardous air pollutant emissions would not be anticipated to expose sensitive receptors to substantial pollutant concentrations.

Operations-related Emissions

With respect to mobile source hazardous air pollutant emissions, implementation of the telecommunication system would result in minimal long-term operation-related emissions. Specifically, the long-term operation of the telecommunication system would only require periodic maintenance trips. Furthermore, implementation of the telecommunication system would not result in the operation of any new major stationary emission sources. Thus, operation-related hazardous air pollutant emissions would not expose sensitive receptors to substantial pollutant concentrations.

3.3.5.2 No-Action Alternative

Under the No-Action Alternative, the construction of new facilities would not occur and there would be no increase in operational emissions. Therefore, under the No-Action Alternative no air quality impacts would occur.

3.4 Noise

This section describes the existing noise environment of the project area, addresses the potential noise impacts associated with project construction and operation, and includes measures to eliminate or reduce potential impacts. For example, potential noise impacts associated with project construction and operation include noise from construction equipment and vehicles, noise from proposed solar electricity-generating equipment, or substation transformers and circuit breakers. Although no adverse noise impacts are anticipated, standard noise-abatement, minimizations, and avoidance measures are proposed to be implemented during both project construction and operations to reduce project-related noise below a level of significance.

3.4.1 Study Methodology

The evaluation of potential noise impacts from proposed Project construction and operation includes reviewing relevant noise laws, ordinances, regulations, and standards; characterizing the existing noise environment throughout the project area; and projecting noise levels from construction and operation of project facilities. Alliance Acoustical Consulting, Inc. prepared a noise analysis for the AMSP as part of the CEC AFC environmental review process (Alliance Acoustical Consulting, Inc. 2009). The AMSP noise analysis provided a detailed list of all applicable noise laws, ordinances, and regulations; a description of the affected environment; and the potential proposed Project effects from both construction and operation. The AMSP noise analysis also identified design features and noise control strategies that would reduce noise impacts below the level of significance (per applicable standards and criteria). Finally, the AMSP noise analysis proposed conditions of approval to ensure compliance to the applicable regulations. The AMSP noise analysis is summarized herein and additional analysis has been included to address potential short- and long-term noise impacts from the Lockhart Substation, interconnection, and fiber-optic telecommunication system. Together these analyses assess all components of the proposed Project.

Noise Measurements

Noise is typically defined as human-caused sound that is considered unpleasant and unwanted. Whether a sound is considered unpleasant depends on the individual who hears the sound and the circumstance under which the sound is heard. An individual's tolerance for noise varies by setting, and setting, in turn, influences changes in the ambient noise environment.

Since the human ear is not equally sensitive to sound at all frequencies, a specific frequency-dependent rating scale was devised to relate noise to human sensitivity. Noise levels are usually measured in A-weighted decibels (dBA), which perform this compensation by discriminating against frequencies in a manner that approximates the human ear, and noise descriptors such as the energy equivalent noise level (L_{eq}) and the day-night average noise level (L_{dn}) are commonly used to account for noise fluctuations over time. Generally, a 3-dBA increase in ambient noise levels is considered the minimum threshold at which most people can detect a change in the noise environment; an increase of 10 dBA is perceived as a doubling of the ambient noise level. A glossary of acoustical terms and concepts is provided as an appendix to this EA (Appendix J). Table 3.4-1 lists various noise sources and the associated noise levels. Although land use on and adjacent to the ASMP site is typical of agricultural cropland, additional noise sources near the site include military and civilian aircraft operations, and vehicular traffic on regional highways and other main roads. Proximity to these additional noise sources results in an increase in ambient noise levels compared to typical agricultural areas.

Table 3.4-1: Typical A-Weighted Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1000 feet		
	— 100 —	
Gas lawn mower at 3 feet		
	— 90 —	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	**— 70 —**	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	**— 60 —**	
		Large business office
Quiet urban daytime	**— 50 —**	Dishwasher next room
Quiet urban nighttime	**— 40 —**	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night, concert
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	**— 0 —**	Lowest threshold of human hearing

Source: Caltrans 2009

Applicable Laws and Regulations

Federal, state, and local jurisdictions have the authority to regulate the ambient noise environment to provide for public health and well-being. Other than state and federal Occupational Safety and Health Administration (OSHA) regulations placing limitations on noise exposure for workers, there are no federal or state policies or regulations that are relevant to noise associated with the proposed Project’s construction or operation. However, the County of San Bernardino has developed regulations through the County Code and County General Plan regarding the ambient noise environment, which are applicable to the proposed Project.

Occupational Safety and Health Regulations

Onsite noise levels are regulated by the Occupational Safety and Health Act of 1970 (29 CFR 1910.95). The noise exposure level of workers is limited to 90 dBA, over a time-weighted average 8-hour work shift to protect hearing. If workers are exposed to a time-weighted average 8-hour period above 85 dBA (i.e., the OSHA Action Level), then the regulations call for a worker hearing protection program that includes baseline and periodic hearing testing, availability of hearing protection devices, and training in hearing damage prevention. Given previous experience at similar modern, combined-cycle facilities, onsite noise levels during normal operations are expected to generally be in the range of 70 to 85 dBA. The relatively few areas that may be above 85 dBA would be posted as high noise level areas and hearing protection would then be required. The AMSP proponent proposes to implement a hearing conservation program for applicable employees and maintain time-weighted average 8-hour period exposure levels below 90 dBA.

The California Department of Industrial Relations, Division of Occupational Safety and Health, enforces California OSHA (Cal/OSHA) regulations [found in Title 8 of the California Code of Regulations (CCR), General Industrial Safety Orders, Article 105, Control of Noise Exposure, Sections 5095, et seq.]. These California worker protection regulations are the same as the federal OSHA regulations described above. OHSA and Cal/OSHA regulations would be applicable to employees at the AMSP and Lockhart Substation and construction workers building the proposed Project.

County of San Bernardino Noise Standards

The County of San Bernardino noise standards are given in the County Code in section 83.01.080[7] (Noise Ordinance). The Noise Ordinance establishes standards concerning acceptable noise levels for both noise-sensitive land uses and for noise-generating land uses. The intent of the Noise Ordinance is to preclude noise-sensitive land uses from being "noise-impacted"—that is, to prevent areas from being exposed to existing or projected future exterior noise levels from mobile or stationary sources that exceed the listed standards. If projected noise levels exceed the standards, then effective mitigation measures will be incorporated into project design to reduce noise levels to the standards. Noise-sensitive land uses include residential uses, schools, hospitals, nursing homes, religious institutions, libraries, and similar uses (83.01.080 (b)). Under the proposed Project, the noise-sensitive uses within several miles of the AMSP/Lockhart Substation site are residential uses. These noise level standards of the Development Code apply to all these residential properties and are given in terms of A-weighted sound pressure level limits during the daytime and nighttime periods.[8] There is also a further delineation of limits for varying noise levels within a given hour in that

[7] County of San Bernardino, Land Use Services Division, adopted March 13, 2007, effective April 12, 2007, amended January 15, 2009. Section 83.01.080 "Noise", beginning on page 3-11.

[8] In the noise ordinance, "daytime" is defined as 7:00 a.m. to 10:00 p.m. and "nighttime" is defined as 10:00 p.m. to the following 7:00 a.m.

shorter accumulations of noise are allowed to have higher levels. Lastly, there are reductions in the limits for noise levels that are particularly intrusive, such as sources that have impact or tonal characteristics. Lastly, there are additions allowed for the noise limits if the existing noise environment is already above the standard's values. For stationary sources, such as this AMSP/Lockhart Substation, there are only exterior sound level limits.[9] The pertinent County noise regulations are summarized in Tables 3.4-2 and 3.4-3.

Table 3.4-2: Basic County of San Bernardino Noise Development Code

Affected Land Use (Receiving Noise)	Exterior Noise Standards	
	Daytime Limit, L_{eq} dBA (7:00 a.m. to 10:00 p.m.)	Nighttime Limit, L_{eq} dBA (10:00 p.m. to 7:00 a.m.)
Residential	55 dBA	45 dBA
Professional Services	55 dBA	55 dBA
Other Commercial	60 dBA	60 dBA
Industrial	70 dBA	70 dBA

Table 3.4-3: Adjustments to the County's Noise Development Code

Timeframe	Adjustment
For a cumulative period of more than thirty (30) minutes in any hour [equivalent to the L_{50} statistical sound level]	Basic standards (above)
For a cumulative period of more than fifteen (15) minutes in any hour [equivalent to the L_{25} statistical sound level]	Basic standards + 5 dB
For a cumulative period of more than five (5) minutes in any hour [equivalent to the $L_{8.3}$ statistical sound level]	Basic standards + 10 dB
For a cumulative period of more than one (1) minute in any hour [equivalent to the $L_{1.6}$ statistical sound level]	Basic standards + 15 dB
For any period of time [equivalent to the L_0 statistical sound level or the L_{max}]	Basic standards + 20 dB

Provision 1: In the event the alleged offensive noise consists entirely of impact noise or simple tone noise, each of the above noise levels will be reduced by five (5) dB.
Provision 2: In the event the ambient noise level exceeds the above limits, the applicable levels will be increased to reflect said ambient noise level.

County of San Bernardino Vibration Standards

The Development Code establishes both subjective and objective standards for assessing allowable vibration levels. Subjectively, "no ground vibration shall be allowed that can be felt without the aid of instruments at or beyond the lot line." Objectively, "(no) vibration (shall) be allowed which produces a particle velocity greater than or equal to two-tenths (0.2) inches per second measured at or beyond the lot line." For a solar plant, high-energy, low-frequency sources of vibration are not expected. The low probability of either groundborne or airborne induced vibration removes further analysis from this assessment.

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9 For mobile sources, there are both exterior and interior standards, as would be applicable, for example, for a housing development next to a busy roadway.

County of San Bernardino Construction Noise and Vibration Standards

The County of San Bernardino recognizes that some forms of noise and vibration are part of life in an urbanized environment. Exemptions to the above noise and vibration regulations are made for "temporary construction, maintenance, repair, or demolition activities" provided said activities take place between the hours of 7:00 a.m. and 7:00 p.m. on weekdays, including Saturday. No exemptions are given for Sundays or federal holidays. The construction/demolition noise exemption is given in Section 83.01.080, subsection (g), paragraph (3) and the vibration exemption is given in Section 83.01.090, subsection (c), paragraph (2).

3.4.2 Affected Environment

The affected environment would include the vicinity around the AMSP, Lockhart Substation, and interconnection; the vicinity around the Kramer, Victor, and Tortilla substations; and the areas along the proposed fiber-optic telecommunication lines. The locations of each of these components are shown in Figure S-1. Noise-sensitive receptors assessed for each component are described in the following summaries.

3.4.2.1 AMSP and Lockhart Substation

The AMSP/Lockhart Substation site is vacant and significantly disturbed from past agricultural activities. The AMSP/Lockhart Substation site and surrounding areas are generally level, with elevations ranging from approximately 2,105 to 2,025 feet amsl.

The area surrounding the AMSP/Lockhart Substation site, including the interconnection location immediately to the south, is sparsely populated with six to eight widely separated residences located between approximately 0.5 and 1.6 miles from the site. These are the closest known residential properties and there are no other noise-sensitive receptors (such as schools, places of worship, or medical facilities) in the vicinity of the AMSP/Lockhart Substation site.

The area around the AMSP/Lockhart Substation site is relatively remote; there are few daytime noise sources. During the mid-day hours, high-altitude overflights of aircraft were observed; primarily military planes. When existing ambient noise measurements were taken, these aircraft produced sonic booms that were clearly audible in the area around AMSP/Lockhart Substation site. Other daytime noise sources included natural sounds from birds and insects. No agricultural activities were noted during the survey.

Ambient Noise Level Survey

Noise monitoring for existing conditions was conducted May 19 through 20, 2009. The noise monitoring consisted of continuous and simultaneous 25-hour noise measurements at two locations (denoted LT-x) and short-term monitoring was conducted at three additional locations (denoted ST-x). Observations at all the monitoring locations were made at various times of the day and night to document local noise sources and the overall noise environment. The noise measurement locations shown in Figure 3.4-1 are described below:

- Location LT-1 – Near a residence at 15563 Edie Road; north side of the dirt driveway; 25+ hour monitoring location.
- Location LT-2 – Near a residence at 41234 Harper Lake Road; north property/fence line; 25+ hour monitoring location.
- Location ST-1 – Near a residence at 15635 Lockhart Road; in adjacent dirt road near abandoned trailer; 15-minute samples at several times during survey period.
- Location ST-2 – Near a residence at 15654 Roy Road; represents three to four homes in cluster; 15-minute samples at several times during survey period.
- Location ST-3 – At the entrance to an abandoned Boys' Oasis facility; junction of Harper Lake Road and Santa Fe Road; near abandoned batch plant (no noise receptors are near this location); 15-minute samples at several times during survey period.

The measurement locations were chosen as they represented the nearest sensitive receptors to the proposed AMSP and Lockhart Substation. As shown in Table 3.4-4, the long-term noise measurements indicated a very quiet environment with few significant noise sources. The major consistent noise source in the area is from wind effects, such as rustling of leaves in trees, and wind interaction with structures. Other noise sources included aircraft flyovers, mostly military jets, occasional sonic booms, sporadic dog barking and bird chirping, and localized events such as a lawn sprinkler at LT-2 or a flag flapping at ST-2. Very few cars or trucks were noted on local roadways.

In the absence of the wind-induced noise, there were essentially no other significant noise sources when typical daytime activities ceased, e.g., sporadic traffic or house air conditioners. Low noise levels in the noise environment surrounding the AMSP/Lockhart Substation site are evidenced by the minimum noise level measurement, which measured at or below 20 dBA during the late-night hours.

As with the long-term measurements, the lack of roadway, railway, industrial, or even farming sources results in a quiet noise environment. Daytime noise levels were typically in the upper-40s to mid-50s dBA and were dominated by wind-induced noise. At night, the short-term measurements also demonstrated the quiet characteristics of the area with L_{eq} values in the low-20s and minimum levels in the high-teens dBA.[10] There were no discernable noise sources at night as the SR-58 traffic and the existing SEGS plant were not audible.

[10] It should be noted that the instrumentation manufacturer reported that the meter and preamp noise floor is on the order of 10 to 12 dBA, while the microphone noise floor specification is 15 dBA. So, the measured, very quiet nighttime noise levels were approaching, but not at, the limiting capabilities of the measurement system.

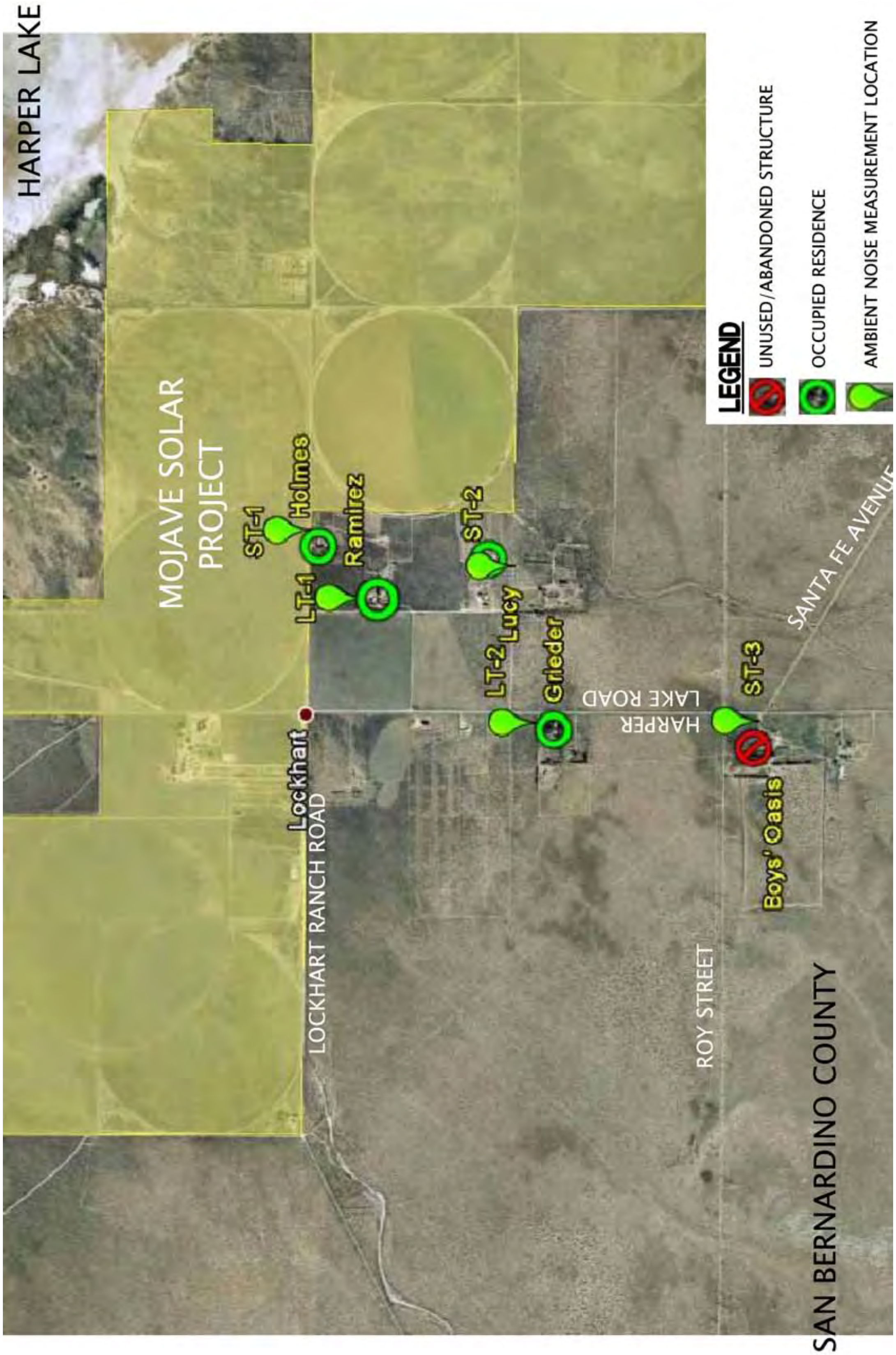

Figure 3.4-1: Noise Measurement Locations

Table 3.4-4: Noise Level Measurements

Type	Source/Label	Date and Time (duration)	24-hour L_{eq}, dBA	L_{dn}, dBA	CNEL, dBA					
Long-Term Monitors	Residence/ LT-1	5/19/09, 13:23 to 5/20/09, 15:02 (25 hours, 39 min)	51.6	51.9	52.1					
	Residence/ LT-2	5/19/09, 13:37 to 5/20/09, 15:14 (25 hours, 36 min)	42	46.7	46.8					
			L_{Min}	L_{eq}	L_{Max}	L_1	L_{10}	L_{50}	L_{90}	L_{99}
Short-Term Samples	Residence/ ST-1	5/20/09, 11:33 (15:00)	26.2	45.4	58.8	56.5	49.1	38.2	28.8	26.3
		5/19/09, 14:26 (15:00)	33.2	48.1	60.7	58	52	44.2	36.5	33.4
		5/19/09, 21:20 (15:00)	24.4	31.1	45	38.4	33.5	29.3	26.4	25
		5/20/09, 03:20 (15:00)	20.1	22.8	37.5	28.1	23.4	22	21	20.3
	Residences/ ST-2	5/20/09, 12:29 (15:00)	23.9	42.6	55.4	52.4	46.8	37.5	29.2	24.9
		5/19/09, 14:51 (15:00)	33.1	49.9	60.4	59.8	53.7	45.9	37.9	33.8
		5/19/09, 20:47 (15:00)	26	38.3	53.6	48.3	41.3	34.1	29.7	26.8
		5/20/09, 04:10 (15:00)	20.1	23.3	35.2	32.1	23.5	21.7	20.6	20.1
	Boys' Oasis/ ST-3 (abandoned & uninhabited)	5/20/09, 13:14 (15:00)	24.7	48.1	63.9	59.2	51.2	42.3	32.1	25.8
		5/19/09, 15:30 (15:00)	33	55.3	69.8	66.1	58.9	49.6	39.7	35.1
		5/19/09, 21:47 (15:00)	32.8	46.3	67.5	54.5	47.2	41	36.3	34
		5/20/09, 04:36 (15:00)	18.6	22.4	41.1	30.1	21.7	19.7	18.9	18.6

CNEL = Community Noise Equivalent Level

3.4.2.2 AMSP Telecommunication System

The Lockhart to Tortilla fiber-optic line is proposed along existing transmission line corridors all the way to Tortilla Substation, located in the City of Barstow. A substantial amount of the existing transmission line route crosses rural, desert lands along existing roads and highways. There are noise-sensitive receptors located in proximity to the southern portion of this alignment; there are residential areas adjacent to this route, primarily in the developed areas surrounding Barstow.

The Lockhart to Kramer fiber-optic line is proposed partially within the AMSP/Lockhart Substation site, but mostly along existing transmission line corridors all the way to the Kramer Substation. Most of this route is in remote areas of the County, with the exception of the far west end of the route that traverses a mixed-use retail/commercial zone near Highway 395/SR-58. No sensitive receptors are identified along this route.

The Kramer to Victor fiber-optic line is located mostly along U.S. Highway 395 in an undeveloped portion of the County. The route does traverse a more urban setting for the southern one-third of the alignment, crossing partially through retail, commercial, and industrial areas. No sensitive receptors are identified along this route.

3.4.3 Environmental Consequences

3.4.3.1 Proposed Action

3.4.3.1.1 AMSP and Lockhart Substation

Construction

Noise impacts from construction are a function of the noise generated by equipment, the location and sensitivity of nearby land uses, and the timing and duration of the noise-generating activities. Potential impacts to noise-sensitive receptors from construction noise would be limited to receptors in proximity to proposed Project facilities. Construction in proximity to residential receptors would occur on weekdays between 7:00 a.m. and 7:00 p.m., which is considered the least sensitive time of day. Daytime receptors such as schools and hospitals could be temporarily affected by construction noise, particularly during the construction of the telecommunication system.

The construction equipment required for this proposed Project is anticipated to be typical (e.g., no pile drivers or rock blasting); however, a temporary concrete batch plant may be required within the AMSP boundary during construction for the substation. Typical construction equipment for the AMSP/Lockhart Substation is estimated to generate maximum noise levels on the order of 80 to 90 dBA at 50 feet, with average noise levels of approximately 70 to 80 dBA L_{eq} at 50 feet depending on the activity and mix of equipment. Without intervening topography or structures, these levels would attenuate over distance at a conservative rate of approximately 6 dBA per doubling of distance (i.e., 80 dBA at 50 feet would attenuate to approximately 74 dBA at 100 feet, and approximately 68 dBA at 200 feet, etc.). Noise levels associated with various pieces of equipment that would be used during construction of the AMSP/Lockhart Substation are provided in Table 3.4-5.

Construction Noise Control Measures

A number of measures are proposed to minimize noise produced during the construction phase of the AMSP and Lockhart Substation, including preconstruction notification to surrounding residents, implementation of a noise control program, restrictions on the hours of construction operations, use of equipment silencing mechanisms, and locating staging areas away from residential areas. Refer to the complete list of measures in Appendix S.

Table 3.4-5: Typical Maximum Construction Equipment Noise Levels

Equipment	Noise Level at 50 ft (dBA)
Backhoe	80
Chain Saw	85
Compactor (ground)	80
Concrete Mixer Truck	85
Concrete Pump	82
Dozer	85
Dump Truck	84
Front End Loader	80
Mounted Impact Hammer (hoe ram)	90
Scraper	85
Tractor	84

KVA = kilovolt amps
Source: Thalheimer 2000

Table 3.4-6 presents the anticipated construction noise levels from various construction stages for the AMSP and Lockhart Substation. Refer to Figure 3.4-1 for the receptor locations relative to the AMSP/Lockhart Substation site. These calculations do not consider topographic or manmade barriers; thus these calculations would be considered conservative. Construction activity associated with the Lockhart Substation would require a similar mix of equipment as the AMSP and noise levels presented in Table 3.4-6 would be representative of construction activity for either component. While construction would result in an increase in ambient noise levels during construction, the increase would be temporary and would be limited to daytime hours when residential land uses are typically less sensitive to noise intrusion. Additionally, the noise levels at the affected receptors would not exceed noise levels typically considered acceptable during construction. Therefore, the construction of the AMSP and Lockhart Substation, as well as associated transmission lines and structures within these sites, would not result in substantial adverse noise impacts.

Table 3.4-6: Predicted Construction Noise Levels

Construction Activity Phase	Aggregate Construction Noise Level at 50 Feet, dBA	Construction Noise Levels at Pertinent Receptors, dBA[1]				
		ST-1 (Holmes)	ST-2 (Lucy)	ST-3 (vacant)	LT-1 (Ramirez)	LT-2 (Grieder)
Site Clearing and Grading	91	62	59	52	61	55
Excavation[2]	90	56	51	47	57	51
Foundation	93	59	54	50	60	54
Building and Erection	93	59	54	50	60	54
Finishing[2]	90	61	58	51	60	54

[1] The aggregated noise levels, using USEPA methodology, were propagated over the various distances to each receptor using an attenuation rate of 6 dB/DD.
Source: USEPA 1971; Alliance Acoustical Consulting, Inc. 2009

Start-up and Commissioning Noise

Upon completion of construction, Mojave Solar would move onto the start-up and commissioning phase in preparation for normal operations. The major noise sources during start-up and commissioning involve air and steam venting. The majority of ventings would be for line cleaning to remove foreign objects and debris that have entered the lines during construction. This is often referred to as “steam blows.” The commissioning and initial start-up would only last a few weeks. While line cleaning only occurs during this relatively short-lived period, the frequency, length, and intensity of steam blows can be adverse if not controlled. Measures listed previously would reduce potential adverse impacts.

In addition to the above planned and controlled line-cleaning discharges, the commissioning and initial start-up phase can also include steam releases from unexpected shut-downs of the steam turbine or other pressurized system as systems are tested. The frequency, duration, and magnitude of these events are variable, depending on the particular plant conditions at the time. Since these unexpected events occur primarily during the few weeks of the initial start-up phase, in emergency situations, and are not planned, discharge vents are not equipped with silencers. However, these potential events would be short term and would be experienced intermittently and only during commissioning and initial start-up. Therefore, steam blows would be adverse but not substantive.

Construction Traffic

Construction traffic would be composed of worker vehicles traveling to and from the work-site plus haul trucks carrying equipment, supplies, and materials in and out of the AMSP/Lockhart Substation site. The only viable road serving the AMSP and Lockhart Substation is Harper Lake Road; thus, it is assumed all construction traffic would use this road to access the site and would represent the location with the greatest potential for construction traffic-related noise increases.

Given the distances between the AMSP/Lockhart Substation site and the nearest urban population center, the project proponent would utilize a worker busing program for efficiency in transporting people to and from the site. This busing program would also be a noise benefit as it would reduce the number of vehicle trips during the construction phase.

Throughout the construction period, haul trucks would bring in building materials, construction supplies, and other equipment, as well as remove construction scrap. These haul trucks have the potential to generate maximum noise levels as high as 80 dBA at a distance of 50 feet from the traveled roadway segment.

However, using an assumed hourly haul truck volume of 25 vehicle trips (12 to 13 trucks entering the site and then leaving again), and a vehicle speed of 25 mph, the worst-case hourly average noise level generated by haul trucks would be approximately 62 dBA at a distance of 50 feet. Noise levels of this magnitude are comparable to measured daytime L_{eq} ambient conditions, such as when strong winds are blowing. The closest residence to Harper Lake Road is 175 feet from the nearest travel lane, and this distance would further reduce the haul truck noise to approximately 51 dBA at this residence. Residences at greater distances would experience lower noise levels. Single-event pass-bys may be a source of annoyance for people in outdoor locations at properties along the haul routes; however, these events would be temporary and can be minimized by maintaining the proper speeds and limiting the use of engine brakes. Therefore, construction traffic would not result in a substantial adverse effect on the existing noise environment at local sensitive receptors.

Worker Exposure

Worker noise exposure levels during the construction phase would vary depending on the nature of activity and the proximity of the workers to the noise-generating activities. Hearing protection would be available and its use would be enforced for workers and visitors, as needed, throughout the construction period. A Hearing Protection Plan that complies with Cal/OSHA and federal OSHA requirements would be incorporated into the Health and Safety Plan.

Operation

The proposed AMSP and Lockhart Substation are the primary components of the proposed Project. A detailed analysis of operation noise was performed for the AMSP and is summarized in the following analysis. Additionally, information has been provided in this analysis to include the Lockhart Substation.

Tonal Noise

As a general rule, modern power plants and substations, even those without significant noise controls, do not produce discrete tones that are prominent or noticeable at typical receptor distances. At the monitoring locations modeled here, no substantive tones are anticipated; however, audible tones are not impossible. Certain sources within the plant, such as transformers or, gearboxes could emit audible tones. The AMSP proponent would incorporate measures into the plant design to prevent sources from emitting tones that might be disturbing at the nearest receptors. No substantial tonal noise impacts are anticipated.

Corona Discharge Noise

Corona discharge results from the partial breakdown of the electrical insulating properties of the air surrounding the conductors. When the intensity of the electric field at the surface of the conductor exceeds the insulating strength of the surrounding air, a corona discharge occurs at the conductor surface, representing a small dissipation of heat and energy. Some of the energy may dissipate in the form of small local pressure changes that result in audible noise, or in radio or television interference. Audible noise generated by corona discharge is characterized as a hissing or crackling sound that may be accompanied by a hum.

Slight irregularities or water droplets on the conductor and/or insulator surface accentuate the electric field strength near the conductor surface, making corona discharge and the associated audible noise more likely. Therefore, audible noise from transmission lines is generally a foul weather (wet conductor) phenomenon. However, during fair weather, insects and dust on the conductors can also serve as sources of corona.

As part of the proposed Project, SCE would install polymer (silicon rubber) insulators on the transmission lines (e.g., interconnector loop-in lines and gen-tie lines between the substation and 220-kV lines offsite). This material is hydrophobic (repels water) and minimizes the accumulation of surface contaminants such as soot and dirt, which in turn reduces the potential for corona noise to be generated at the insulators. No substantive noise impact is projected.

Plant Operations Noise

To analyze the operational noise impacts of the AMSP, a computerized noise prediction program was used to simulate and model the noise propagation from the site. The model is based on industry-accepted propagation algorithms and acoustical standards. The noise model used the AMSP layout configurations and equipment information for the proposed facility, as well as noise source input levels derived from manufacturers' data, field surveys of similar equipment, and past experience with many comparable power plant projects (Alliance Acoustical Consulting, Inc. 2009). The noise levels projected represent the anticipated steady-state level from the plant with essentially all equipment operating at full-load conditions.

Plant components that were deemed to be substantial noise sources were included in the noise model. As the AMSP is a solar power plant with no thermal storage capabilities, it would only operate during daylight hours. Only limited, small pumps are expected to operate for selected activities. Thus, separate daytime and nighttime scenarios were analyzed in the AFC due to the difference in operating conditions. Conservative assumptions were used in the modeling to predict higher values than would be expected in the real-world environment.

A substantive noise impact may occur if noise from a new facility increases the existing late-night average residual noise levels, L_{90}, by 5 or more dBA at nearby residential areas. Table 3.4-7 presents the modeled facility noise levels at the nearby residential areas, the existing late-night residual noise levels (L_{90}), the projected future noise level from the AMSP during nighttime operations, and the projected increase in noise.

With only the relatively small circulation pumps running during the late-night hours, the nighttime noise increases attributed to the AMSP are expected to be approximately 1 to 4 dB at the nearest residences (Alliance Acoustical Consulting, Inc. 2009). At the farthest residence (Location LT-2), the AMSP would not be expected to result in an increase above existing nighttime ambient noise levels. No substantive noise impact is anticipated.

Table 3.4-7: Predicted AMSP Operations Noise Levels

Location	Residual (L_{90}) Ambient Noise Level, (dBA)	Predicted Nighttime Project Noise Level, (dBA)	Cumulative (Ambient Plus Plant) Noise Level (dBA)	Change due to Project, (dB)
LT-1	21.2	22	24.6	+3.4
LT-2	26.8	7	26.8	+0
ST-1	21.0	21	24.0	+3.0
ST-2	20.6	15	21.6	+1.0

Note: Locations ST-3, BLM-1, and BLM-2 are not included in this table as they do not represent sensitive receptor locations.
Sources: Alliance Acoustical Consulting, Inc. 2009

Substations, such as the proposed Lockhart Substation, usually generate steady noise from the operation of power transformers, and the cooling fans and oil pumps needed to cool the transformer during periods of high electrical demand and peak noise events from circuit breakers. The transformer hum is a result of magnetic forces within the core of the transformer. Typically, the noise level does not vary with transformer load, as the core is magnetically saturated and cannot produce any more noise. Circuit breaker noise would only occur to protect the grid in an unusual event, such as a lightning strike.

While the exact transformers proposed for the Lockhart Substation are unknown at this time, transformers typically range in noise levels from 60 to 80 dBA at 3 feet (McDonald 2007). Typically, transformers are located near the center of the substation footprint; thus, it is assumed all transformers would be at least 60 feet from the substation site boundary. Circuit breaker noise occurs only occasionally and not during normal operations. A circuit breaker can generate maximum instantaneous noise levels on the order of 90 dBA L_{max} at 65 feet. While these events can be noticeable, they are rare and short term.

Noise levels from the substation were calculated assuming a conservative propagation rate with no consideration of terrain or intervening structures. The resultant noise levels are presented in Table 3.4-8 and combined with noise levels predicted for the AMSP. As shown, the proposed AMSP and Lockhart Substation together would result in a maximum noise level increase of 4 dBA.

Even with very low late-night ambient environments around the AMSP site, future noise increases attributed to the AMSP and the Lockhart Substation would be less than 5 dB at the surrounding residential locations because of minimal nighttime noise sources in each power block and due to the distance between the site and residential locations. The AMSP and Lockhart Substation would not generate substantive operational noise impacts.

Table 3.4-8: Predicted AMSP and Lockhart Substation Operations Noise Levels

Location	Residual (L_{90}) Ambient Noise Level (dBA)	Predicted Nighttime Project Noise Level (dBA)	Lockhart Substation High Noise Level (dBA)	Combined (Ambient Plus Plant) Noise Level (dBA)	Change due to Project, (dB)
LT-1	21.2	22	16.0	25.2	4.0
LT-2	26.8	7	14.7	27.1	0.3
ST-1	21	21	15.8	24.6	3.6
ST-2	20.6	15	18.5	23.4	2.8

Note: Locations ST-3, BLM-1, and BLM-2 are not included in this table as they do not represent sensitive receptor locations.
Source: Alliance Acoustical Consulting, Inc. 2009

While operational noise is not expected to be substantively adverse, a few measures are proposed to be incorporated into the plant operations to avoid any potential effects over the long term. Among others these include implementation of a community noise survey, an occupational noise survey, and use of low noise equipment and trucks for mirror washing. A complete list of measures is provided in Appendix S.

Operations Traffic Noise

The AMSP is expected to have from 63 to 73 full-time employees for an ongoing workforce and the Lockhart Substation would not require dedicated operations employees. No long-term traffic noise would be expected with the substation. Minimal trips associated with maintenance can, however, be expected but would not generate significant trips. The proposed interconnection would not generate operational trips. To provide a conservative assessment, it is assumed the Lockhart Substation would increase peak hour traffic volumes by two vehicles.

The ongoing operations traffic for the proposed AMSP and Lockhart Substation is comparable to the existing traffic conditions associated with the current SEGS facilities. As such, the addition of the AMSP and Lockhart Substation traffic would double the peak-hour traffic volumes on Harper Lake Road. A doubling for the future conditions would result in a 3-dBA increase in traffic-related contributions, with all other variables (e.g., speed and distances) being held equal. A +3-dBA increase in hourly noise levels would be considered barely perceivable to the average human ear (FICON 1992). Additionally, given the intermittent and sporadic nature of such vehicle pass-bys, overall noise levels along Harper Lake Road would be low. Given these low volumes (one car every other minute versus one car every minute), the most likely receptor response would be that the frequency of occurrence had changed, but not that the hour-long average noise level had changed.

Since future operations traffic noise levels would not result in a change over current conditions, operations traffic noise for the proposed AMSP and Lockhart Substation is considered to be minimal and not adverse.

3.4.3.1.2 Telecommunication System

Construction

The Lockhart to Tortilla line includes approximately 31 miles of new fiber-optic cable to be installed aboveground on mostly existing transmission line poles, with the exception of three replacement poles and a portion of cable that would be installed in both a new underground conduit along Harper Lake Road and an existing underground conduit near the Tortilla Substation. Construction noise from stringing cable on existing poles would be less than noise from trenching and new pole construction. As noted for the ASMP and Lockhart Substation above, typical construction equipment is estimated to generate maximum noise levels of short duration not to exceed 90 dBA at 50 feet, or average levels of approximately 70 to 80 dBA L_{eq} at 50 feet. Trenching uses typical construction equipment. While trenching activities would generate temporary short-term noise levels that could be a nuisance to the receptors nearest the trenching activities, these increases would be short term and would not be considered substantive.

The Lockhart to Kramer fiber-optic line would require the construction of approximately 30 new poles within the boundary of the AMSP site. Outside the site, the majority of this line would involve stringing cable on existing overhead utility poles, limiting the construction noise impacts to stringing equipment. Four replacement poles would be required, however, three along Harper Lake Road and one next to the Kramer Substation. The entire alignment is within existing utility ROWs in remote areas away from noise-sensitive receptors. Ground-disturbing activities from new trenching for underground cable within the AMSP property and excavation for the footings of 30 new poles, also within the AMSP boundary, would generate construction noise levels lower than noise levels associated with construction of the AMSP and the Lockhart Substation. The four replacement poles would require greater noise than the stringing, pulling, and splicing activities on existing poles; however, the four replacement poles are not in proximity to noise-sensitive receptors and the noise would be of short duration. The stringing and installation of fiber-optic cable on existing poles would generate lower noise levels than those associated with other activities. As noted previously, typical construction equipment is estimated to generate maximum noise levels of short duration not to exceed 90 dBA at 50 feet, or average levels of approximately 70 to 80 dBA L_{eq} at 50 feet. Cable placement falls in the lower category and is anticipated to generate noise levels on the order of 72 dBA L_{eq} at 50 feet. These noise levels would not exceed any local noise standards.

The Kramer to Victor fiber-optic line includes approximately 34 miles of new fiber-optic cable to be installed primarily on existing transmission poles, with a few locations requiring new poles and trenching. The overhead cable would require the construction of approximately 30 new poles along existing utility ROWs. Construction activities for the excavation and trenching for the underground cable would result in typical construction noise. The stringing and installation of fiber-optic cable on existing poles would generate fairly low noise levels, as noted above. While trenching activities would generate temporary short-term noise levels that could be a nuisance to the receptors nearest the trenching activities, these increases would be short term and would not be considered substantial. The proposed new pole locations and trenching locations are not in proximity to sensitive receptors.

Operation

As previously discussed, the proposed fiber-optic lines would not represent substantial new noise sources and thus would not result in an adverse impact on the existing or future noise environment.

The only other component of the telecommunication system that is anticipated to generate noise would be the telecommunication room at the Tortilla Substation. The noise source associated with the telecommunication room would likely be an exterior wall-mounted air conditioning unit. These units typically generate maximum noise levels of approximately 85 dBA at 3 feet. The nearest receptor to the Tortilla Substation is the Veterans Home of California, at 100 E. Veterans Parkway, located approximately 1,100 feet to the northeast. At this distance, noise levels associated with an air conditioner would attenuate to 33 dBA or less. Additionally, the telecommunication room would be designed to orient the air conditioning unit toward other equipment within the substation to shield surrounding properties.

3.4.3.2 No-Action Alternative

Under the No-Action Alternative, the construction of new facilities would not occur and there would be no change from an operational noise perspective. Therefore, under the No-Action Alternative no adverse noise impacts would occur.

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3.5 Geology, Soils, and Seismicity

3.5.1 Study Methodology

The study methodology for analysis of the geology, soils, and seismicity of the proposed Project included a basic review of applicable laws, ordinances, and regulations; identification of the geologic setting and geologic hazards; location of faulting and occurrence of seismicity; and baseline soil conditions and physical properties. The geologic information pertaining to the region and the AMSP/Lockhart Substation site (which includes the interconnection area) is based on a study prepared by Ninyo & Moore in 2009, *Geotechnical Evaluation Mojave Solar Project, Lockhart, California, May 15, 2009*. A geologic map of the site vicinity is shown in Figure 3.5-1.

3.5.2 Affected Environment

The following affected environment discussion addresses the geologic, seismic, and soils setting for the region, covering both the AMSP/Lockhart Substation site and the proposed fiber-optic telecommunication study area.

Geology

The proposed Project is located in the central Mojave Desert, which is part of the greater Mojave Desert Geomorphic Province. The Mojave Desert is one of 11 geomorphic provinces recognized in California. Each province displays unique, defining features based on geology, faults, topographic relief, and climate (California Geological Survey 2002). The Mojave Desert Province is characterized by broad alluvial basins of Cenozoic sedimentary and volcanic materials overlying older plutonic and metamorphic rocks (Dibblee 1980). This province lies between the northeast-trending Garlock Fault on the north and the northwest-trending San Andreas Fault on the south. Several smaller northwest-trending faults are present within the province, including the Lenwood-Lockhart-Old Woman Springs Fault, located approximately 0.5 mile southwest of the AMSP/Lockhart Substation site (Ninyo & Moore 2009; Appendix K).

Surface water in Harper Valley drains to Harper Lake; however, Harper Lake is generally a dry lake bed. At the solar plant site, surface drainage is by sheetflow runoff toward Harper Lake to the northeast. There are no permanent bodies of water located on the AMSP/Lockhart Substation site, nor along the proposed fiber-optic corridors. The Lockhart to Tortilla Substation fiber-optic route line would span over the Mojave River near Barstow, utilizing existing transmission poles on either side. The Mojave River carries seasonal flows (mostly February through April) and surfaces only in areas with impermeable rock, such as the upper and lower narrows near Victorville, and in the Afton Canyon area northeast of Barstow. On rare occasions, the river will surface flow the entire length. Runoff volumes range between 5,000 and 360,000 acre-feet per year (AFY) depending on climate conditions and based on 39 years of daily flow rates, the mean daily discharge is 56 cubic feet per second (cfs), and the maximum daily discharge is 825 cfs (1998) (USGS 2010).

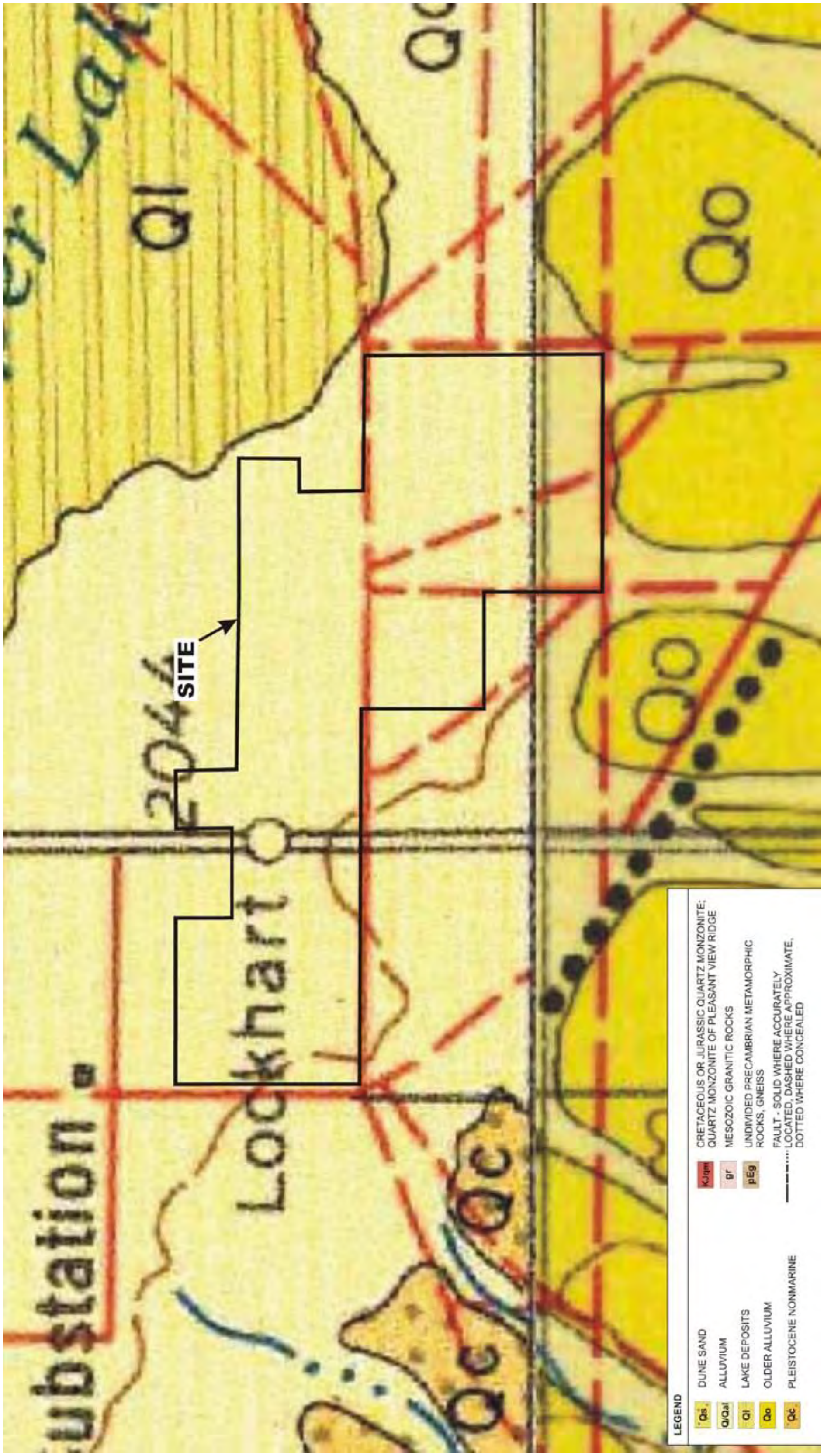

Figure 3.5-1: Geologic Map

Based on a review of groundwater depth records for nearby wells, it is anticipated that the regional groundwater table at the AMSP/Lockhart Substation site is at a depth of more than 100 feet (California Department of Water Resources 2009). However, during a geotechnical subsurface exploration, perched groundwater was encountered at depths as shallow as 4 feet in the vicinity of Harper Lake (Ninyo & Moore 2009). Perched groundwater was also encountered in the vicinity of the proposed Alpha and Beta power blocks at a depth of approximately 27 feet. A more detailed discussion of groundwater conditions is provided in Section 3.7.

Faulting and Seismicity

The AMSP/Lockhart Substation site, interconnection, and telecommunication system are located in seismically active Southern California, a region that experiences numerous earthquakes. Also, a portion of the AMSP/Lockhart Substation site is located within a State of California Alquist-Priolo Earthquake Fault Zone. Refer to Table 3.5-1 for the active faults in the study area and their distance from the AMSP/Lockhart Substation site.

Table 3.5-1: Principal Active Faults

Fault Name	Approximate Distance from AMSP/Lockhart Substation		Maximum Moment Magnitude
	Miles	Kilometers	
Lenwood-Lockhart-Old Woman Springs	0.4 (2,300 feet)	0.7	7.5
Helendale-S. Lockhart	6.6	10.6	7.3
Gravel Hills-Harper Lake	9.0	14.5	7.1
Blackwater	15.4	24.7	7.1
Calico-Hidalgo	24.2	39.0	7.3
Landers	32.3	52.0	7.3
Garlock (East)	34.3	55.2	7.5
Garlock (West)	41.6	66.9	7.3
San Andreas (Mojave)	47.7	76.7	7.4
San Andreas (San Bernardino)	50.6	81.4	7.5

Source: Cao et al. 2003; Blake 2001

The active Lenwood-Lockhart-Old Woman Springs Fault is located approximately 2,300 feet southwest of the AMSP/Lockhart Substation site. Table 3.5-1 lists selected principal known active faults within a radius of approximately 60 miles from the AMSP/Lockhart Substation site, the approximate fault-to-site distances, and the assigned maximum moment magnitude earthquake as published by Cao et al. (2003) for the California Geological Survey. The fault-to-site distances were calculated using the computer program FRISKSP (Blake 2001).

Since an Alquist-Priolo Earthquake Fault Zone had been mapped on the AMSP/Lockhart Substation site, a geologic evaluation was conducted to ascertain the actual presence and location of the fault trace so that appropriate setbacks could be established for human occupancy structures. Human occupancy structures are defined as any structures that are used or intended to be used for supporting or sheltering any use or occupancy that is expected to have a human occupancy rate of more than 2,000 person-hours per year. The Alquist-Priolo Earthquake Fault Zone mapping of the trace of the unnamed fault was based on aligned tonal lineaments, a subtle scarp in Holocene alluvium, and the linear western shoreline of Harper Lake. These physiographic features are suggestive of faulting but not conclusive. To physically assess the mapped presence of the fault, an exploratory trench was excavated across the Alquist-Priolo Earthquake Fault Zone (Ninyo & Moore 2009). After detailed geologic logging of the trench walls, it was concluded that there was no evidence for the presence of active faulting within the Alquist-Priolo Earthquake Fault Zone where the AMSP and Lockhart Substation and interconnection are located (see Appendix K). A site-specific geologic study was not prepared for the proposed fiber-optic telecommunication system; no human occupancy structures are proposed for that element of the project.

Geologic Hazard

Seismic hazards related to earthquakes and ground shaking include ground rupture, slope stability, liquefaction, subsidence, tsunamis, and seiches. Due to the inland location of the proposed AMSP, Lockhart Substation, interconnection, and telecommunication system, as well as the absence of nearby large bodies of water, hazards from tsunamis and seiches are not present.

Since it has been shown that active faulting does not occur in the Alquist-Priolo Earthquake Fault Zone where the AMSP/Lockhart Substation site is located, and there are no other known or suspected active faults on the site, the potential for ground surface rupture due to onsite faulting is considered low.

Southern California is an actively seismic area and therefore the region is subjected to ground shaking from movement along one or more of the region's active faults over time. According to a probabilistic seismic hazard model for California, peak horizontal ground accelerations having a 10% probability of exceedance within 50 years can be estimated to be approximately 0.3 g (30% of gravity), which is considered a low to moderate probability when compared to some of the more seismically active areas of California (California Geological Survey 2003). Historical earthquakes of magnitude 6.0 or greater with epicenters within approximately 100 kilometers (62 miles) of the study area are shown in Table 3.5-2.

Other notable earthquakes that occurred in the Mojave Desert, but with epicenters more than 100 kilometers from the AMSP/Lockhart Substation site, include the Landers Earthquake in 1992 with a magnitude of 7.3 and the Hector Mine Earthquake in 1999 with a magnitude of 7.1.

The AMSP/Lockhart Substation site, interconnection, and telecommunication system are not considered to be within an area with the potential for permanent ground displacement due to earthquake-induced landslides because surface topography at and near the various project elements is relatively flat, with the exception of where new poles may be installed near Kramer Hills. Further, based on the topography, there are no indications of active or ancient landslides on the site.

Table 3.5-2: Historical Earthquakes That Affected AMSP/Lockhart Substation Site

Date	Approximate Epicentral Distance from Site		Magnitude
	Miles	Kilometers	
July 22, 1899	50	80	8
September 20, 1907	57	92	7
April 10, 1947	44	71	7
June 28, 1992	62	100	6.5

Source: California Geologic Society 2003

Liquefaction is the phenomenon in which loosely deposited granular soils with silt and clay contents of less than approximately 35% and nonplastic silts located below the water table undergo rapid loss of shear strength when subjected to strong earthquake-induced ground shaking. Ground shaking of sufficient duration results in the loss of grain-to-grain contact due to a rapid rise in pore water pressure (i.e., pressure of groundwater held within rock gaps) and causes the soil to behave as a fluid for a short period of time. Liquefaction is generally known to occur in saturated or near-saturated cohesionless soils at depths shallower than 50 feet below the ground surface.

As part of the geotechnical subsurface evaluation for the AMSP/Lockhart Substation site, an analysis was made of the liquefaction potential of the subsurface soils at the proposed Alpha and Beta power blocks where perched groundwater was encountered with an assumed depth of 27 feet (Ninyo & Moore 2009). The liquefaction analysis indicated that minor zones within the medium-dense granular soil layers occurring below the assumed groundwater level, and up to a depth of 37 feet below the ground surface, are susceptible to liquefaction.

Subsidence due to groundwater withdrawal has been documented in various regions of the Mojave Desert. As part of the geotechnical subsurface evaluation for the AMSP/Lockhart Substation site, a review of well records for three wells on Lockhart Road, east of Harper Lake Road, was made to evaluate the subsidence potential. It was found that the groundwater level was at a depth of 18 feet in 1919, 95 feet in 1953, and 176 feet in 1996 shortly after much of the agricultural pumping ended in Lockhart. It was also found that the groundwater had since risen to a depth of approximately 140 feet.

Erosion is the displacement of solids (soil, mud, rock, and other particles) by wind, water, or ice and by downward or downslope movement in response to gravity. Due to generally flat terrain, the AMSP/Lockhart Substation site is not prone to substantial erosion from water. However, the soils in this part of the Mojave Desert are classified as being highly susceptible to wind erosion (USDA 2009).

Geologic Resources

Recreational and unique geologic resources and features typically include rock or mineral collecting, surface hydrothermal features, or surface expression of geologic features unique enough to generate recreational interests of the general public (natural bridges, caves, waterfalls, etc.). There are no such features on the AMSP/Lockhart Substation site, nor are there any county, state, or federal recreation areas on or adjacent to the site. There are no known oil, gas, or geothermal resources on or adjacent to the AMSP/Lockhart Substation site. Sources beneath the fiber-optic cable routes were not investigated due to the above-ground, surficial nature of that part of the project.

Soils

Soils in the Mojave Desert are shallow, deep, or very deep and are well drained to excessively drained (USDA 1981). The surface layer ranges from sand to clay loam. Sandy surface layers are highly susceptible to blowing, shallow soil depth, and low available water capacity and have a hazard of erosion due to slopes and insufficient plant cover (USDA 1981).

The AMSP/Lockhart Substation site and interconnection are located in the alluvial-filled basin of the Harper Valley. The ground surface in this region generally slopes gently downward in a northeast direction. Drainage at the solar plant site occurs as sheet flow across the property toward Harper Dry Lake. Much of the surface water infiltrates into the sandy alluvium.

The northeasterly portion of the AMSP/Lockhart Substation site is located near the southwest portion of the dry Harper Lake, which is underlain by Holocene-age lake bed deposits. Based on a geotechnical subsurface exploration, the lake bed deposits generally consist of damp to saturated, loose to medium dense silt and sand, and soft to firm clay (Ninyo & Moore 2009). Also, based on the geotechnical exploration, remaining portions of the site are underlain by thin surficial deposits, such as alluvial soils which are, in turn, underlain by older alluvial deposits at shallow depths. The older alluvial deposits were reported as generally consisting of damp to saturated, loose to very dense, silty and clayey fine to coarse sand with occasional layers of gravel, silt and clay, and wet hard, fine sandy and silty clay. Some layers of caliche consisting of strongly cemented layers of sand and silt were also reported

The majority of the AMSP/Lockhart Substation site is underlain by Cajon sand and Cajon loamy sand with Kimberlina loamy fine sand and the Norob-Halloran complex covering smaller portions of the site (Figure 3.5-2). Nonirrigated, the onsite soils are classified as having a very severe limitation that make them unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat (USDA 2009). Irrigated, most of the onsite soils are classified as having a severe limitation that restricts the choice of plants or requires very careful management or both, with the main problem being the hazard of erosion. The parent material for the onsite soils is alluvium, mostly derived from granitic rock sources. The dominant soil types on the site are classified as "somewhat excessively drained." Table K-1 in Appendix K discusses the soil mapping unit descriptions and characteristics.

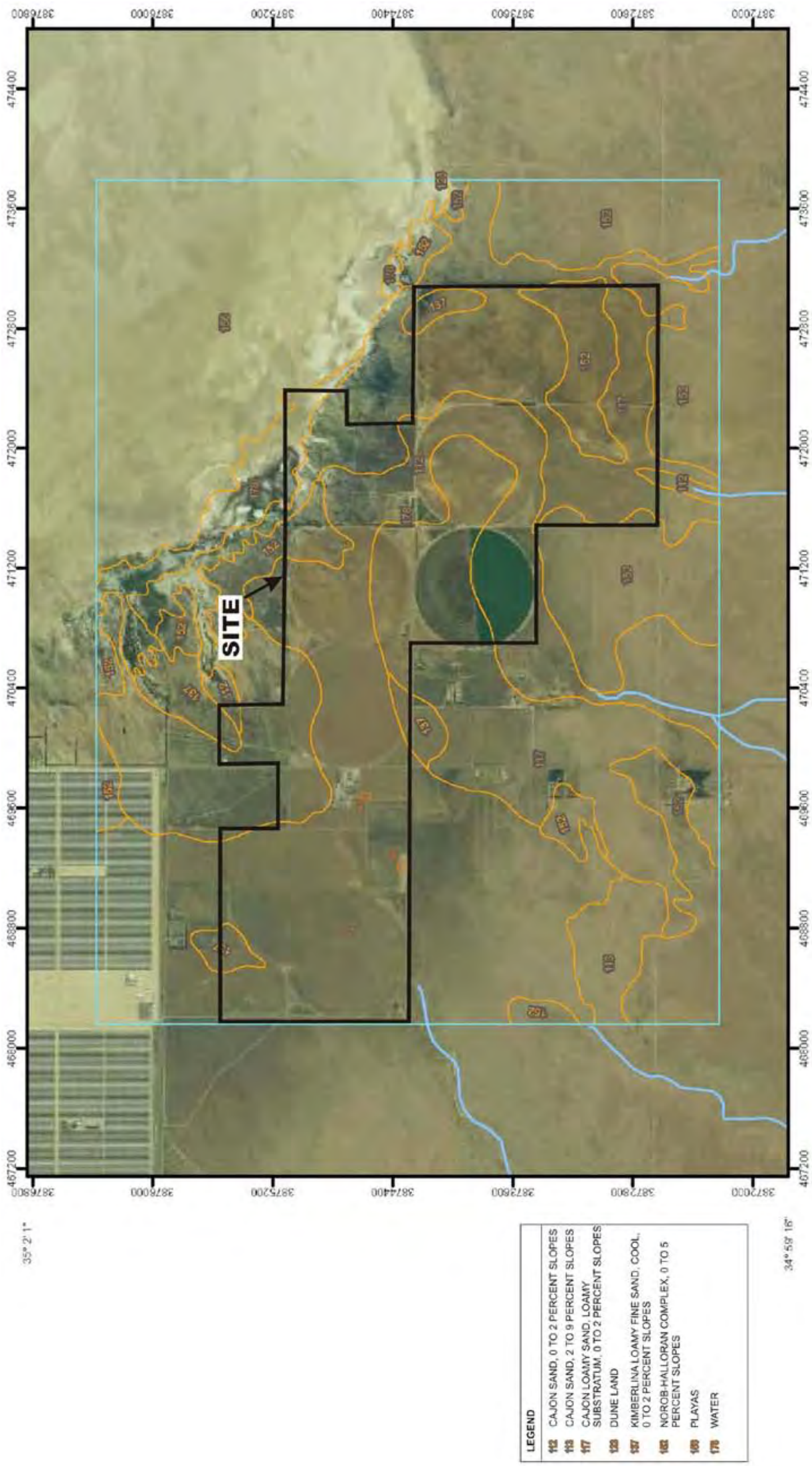

Figure 3.5-2: Soil Map

Expansion or Collapsible Soil Structures

Soil collapse, or hydro-consolidation, occurs when soils undergo a rearrangement of their grains and a loss of cementing agents, resulting in substantial and rapid settlement under relatively low loads. This phenomenon typically occurs in recently deposited Holocene soil in a dry or semiarid environment, including eolian (windblown) sands and alluvial fan and mudflow sediment deposited during flash floods. The combination of weight from a building or other structures, and an increase in surface water infiltration (such as from irrigation or a rise in the groundwater table) can initiate settlement and cause structural foundations and walls to crack. Based on the geotechnical subsurface evaluation performed for the AMSP/Lockhart Substation site, except for minor areas in the vicinity of Harper Lake, most of the site is underlain by "older alluvium." Older alluvium consists of alluvial deposits that are older than recently deposited Holocene alluvium and as such are more consolidated and less prone to soil collapse. Collapsible soils were not encountered in the geotechnical design evaluation performed for the AMSP (Ninyo & Moore 2009).

Expansive soils contain significant amounts of clay particles that have the ability to give up water (shrink) or take on water (swell). When these soils swell, the change in volume can exert significant pressures on loads that are placed on them, such as buildings, and can result in structural distress and/or damage. Due to the predominately granular nature of the older alluvial deposits that underlie the majority of the AMSP/Lockhart Substation site, the potential for significant amounts of expansive soils is considered very low.

3.5.3 Environmental Consequences

3.5.3.1 Proposed Action

3.5.3.1.1 AMSP and Lockhart Substation

Seismic Ground Shaking

The AMSP/Lockhart Substation site is in the seismically active Southern California region; thus, it would be subject to ground shaking, and potentially subject to ground accelerations from earthquakes along faults in the region. The potential for earthquake-related impacts would begin during project construction. However, seismic impacts would be of greater concern during long-term AMSP/Lockhart Substation operation than during the limited duration of the construction phase. These impacts are discussed immediately below.

Due to the relatively close proximity of the Lenwood-Lockhart-Old Woman Springs Fault, a moderate probability of damage from surface fault rupture on that fault is considered to exist at the AMSP/Lockhart Substation site. Also, the potential exists for lurching or cracking of the ground surface on the site as a result earthquake shaking.

However, the AMSP and Lockhart Substation would be designed and constructed to meet International Building Code/California Building Code requirements for industrial facilities and would adhere to sound professional practices and appropriate regulatory requirements related to geologic hazards (e.g., grading, slope stability). Further, the geotechnical design report prepared in 2009 addresses geotechnical issues to assist in the design and construction of the AMSP. For these reasons, the AMSP and Lockhart Substation are not expected to have extensive involvement with geologic hazards or resources.

Construction-related impacts to the geologic environment primarily are related to terrain modification (cuts, fills, and drainage diversion measures) and dust generation (excavation and grading). No major unique geologic or physical features have been identified on the AMSP/Lockhart Substation site.

Site-specific geotechnical and seismic conditions will be appropriately addressed in the detailed design and construction of AMSP facilities and equipment. A number of measures are proposed to minimize the potential for adverse effects, including designing structures in accordance with the Alquist-Priolo Earthquake Fault Zoning Act and the Electrical and Electronic Engineers' 693 Recommended Practices for Seismic Design of Substations. Measures specific to the design of the AMSP and Substation are listed in Appendix S.

Regional and local geologic conditions will not be substantially altered by the long-term operation of the AMSP and Lockhart Substation. No major unique geologic or physical features have been identified within or around the AMSP/Lockhart Substation footprint.

The AMSP/Lockhart Substation area may be underlain by deposits of sand and gravel, potential commercial resources; however, these resources would not be recovered or used during the active life of the AMSP and Lockhart Substation. No other impacts to the geologic environment were identified. In addition, based on the understanding that the groundwater withdrawal for the proposed solar plant will be less than the natural aquifer recharge, it was concluded that groundwater levels should continue to rise and as such there should be little potential for subsidence due to groundwater withdrawal (Ninyo & Moore 2009).

Water Erosion

The runoff designations for the soils affected during site grading are low to negligible for the Cajon sand and the Cajon loamy sand, dominant soil types on the AMSP/Lockhart Substation site and negligible to moderate for the other soil types. Refer also to Section 3.7.

Wind Erosion

The soils on the AMSP/Lockhart Substation site have a moderate to high hazard for wind erosion. BMPs are expected to minimize soil loss due to wind erosion. Systematic watering of active grading areas during construction at least twice daily is expected to substantially reduce windborne dust. Water will be used during grading, both in the site preparation and compaction effort and to support dust control. Water applied to control dust will be pumped from existing groundwater wells and will be applied at a rate to minimize and control runoff.

Construction

Mass grading of the plant site will result in a relatively flat site that slopes gently to the east and north with terraces for each field. Earthwork associated with the AMSP and Lockhart Substation will include mass grading, and excavations for foundations and underground systems. The total earth movement that will occur is approximately 4.158 million cubic yards.

During construction, the majority of the onsite soils will exhibit a rapid permeability. Given the climatic conditions of the desert with particularly low rainfall amounts, implementation of BMPs, including temporary erosion control such as crushed rock, silt fences, and fiber rolls during construction, will limit the potential for soil loss from water erosion. Potential adverse soil erosion impacts will be minimized by implementation of measures such as constructing berms to control stormwater runoff, clearing areas as needed for construction, utilization of silt fencing and fiber rolls, covering stockpiled soils, and use of water to control dust. A complete list of measures is included in Appendix S.

Refer also to Section 3.7 for additional BMPs to control water runoff and soils erosion.

Operation

With implementation of BMPs, and associated monitoring activities included in the operation phase SWPPP, soil erosion would be expected to be minor during operation of the AMSP and Lockhart Substation. Further, soil stabilizers would be used within the solar array area to reduce the amount of dust deposited on the solar collectors, as dust affects their efficiency.

Postconstruction actions would include dust control through periodic watering, and placement of gravel berms and detention structures to control sediment loss and manage stormwater runoff. The power island area would be graded with moderate slopes to direct runoff to the oil-water separator curbed area. Diversion ditches and the proposed detention area would be designed to accommodate flow from a 100-year storm event. Roads and paved areas would be kept free of dust, dirt, and visible soil materials. An entrance/outlet tire wash area is proposed as well. Sufficient materials would be kept onsite to implement temporary control measures during the operational life of the plant.

By its nature, a solar thermal project must keep dust to a minimum, as a film on the mirrors of the solar array would reduce the efficiency of the solar plant. Dust control would be achieved by a combination of soil stabilizers, water from the mirror washing, and compaction of the driving surface over time. Utilizing these operational measures has been effective at the neighboring SEGS facilities.

3.5.3.1.2 Telecommunication System

A majority of the offsite improvements consist of stringing fiber-optic cable on existing transmission line poles with limited trenching and installation of new or replacement poles in a few areas. Any construction impacts would be short-term construction impacts. Examination of the soil series present in areas where poles would be installed or where the limited trenching would occur reveals that soils in these areas consist of sand and sandy loams with characteristics like those present on the AMSP/Lockhart Substation site.

Grading is not proposed for the cable-pulling activities and no impacts to existing drainages, or surface or subsurface water sources are anticipated during the construction phase. There are several instances where new poles would be installed to string the fiber-optic cable and a few instances where trenching is proposed to install the cable in underground conduit. Construction activities associated with trenching and pole installation would be localized and short term given the minimal excavation proposed. Trenches would be approximately 15 inches wide and 36 inches deep, and stockpiled soils would be replaced back into the trench on the same day as cable installation. Debris and runoff from these activities are not anticipated.

In addition, the following measure would be applicable to the construction activities associated with the extension of the fiber-optic cable:

- An erosion control plan will be developed and implemented to ensure minimum soil loss and to maintain water quality. Temporary and long-term erosion control measures will be constructed and maintained as necessary during and following construction until long-term stabilization has been established.

3.5.3.2 No-Action Alternative

Under the No-Action Alternative, DOE would not issue Mojave Solar a loan guarantee for construction of the proposed AMSP, and Mojave Solar would not proceed with the proposed Project. Absent the proposed Project, geologic and seismic conditions would remain constant, and the probability for seismic activity in the area would continue to be moderate.

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3.6 Paleontological Resources

3.6.1 Study Methodology

This assessment of paleontological resources was conducted in accordance with the professional standards of the Society of Vertebrate Paleontology by SWCA Environmental Consultants, June 2009 and June 2010. Their first study addressed the AMSP only and the second study addressed the offsite project elements (i.e., fiber-optic lines and interconnect). Additional details from these reports can be found in Appendix L. The assessments were based on a comprehensive literature review, museum records search, and fieldwork for the AMSP/Lockhart Substation and telecommunication system.

For this project, a museum records search was performed by the Department of Earth Sciences at the San Bernardino County Museum. Museum collections records were searched for the purposes of determining whether there are any known fossil localities in or near the proposed Project study area, identifying the geologic units present, and determining the paleontological sensitivity ratings of those geologic units to assess potential impacts to nonrenewable paleontological resources. Published and unpublished literature and geologic maps were reviewed, and environmental protection measures specific to this proposed Project were developed in accordance with the Society of Vertebrate Paleontology's professional standards and guidelines (1995).

Paleontological sensitivity is defined as the potential for a geologic unit to produce scientifically significant fossils. This is determined by rock type, past history of the geologic unit in producing significant fossils, and fossil localities recorded from that unit. Paleontological sensitivity is derived from the known fossil data collected from the entire geologic unit, not just from a specific survey. In its *Standard Guidelines for the Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources*, the Society of Vertebrate Paleontology (1995:23) defines three categories of paleontological sensitivity (potential) for sedimentary rock units: high, low, and undetermined:

- **High Potential.** Rock units from which vertebrate or significant invertebrate fossils or suites of plant fossils have been recovered and are considered to have a high potential for containing significant nonrenewable fossiliferous resources. These units include, but are not limited to, sedimentary formations and some volcanic formations that contain significant nonrenewable paleontologic resources anywhere within their geographical extent and sedimentary rock units temporally or lithologically suitable for the preservation of fossils. Sensitivity comprises both (a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, or botanical, and (b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, ecologic, or stratigraphic data. Areas that contain potentially datable organic remains older than Recent, including deposits associated with nests or middens, and areas that may contain new vertebrate deposits, traces, or trackways are also classified as significant.

- **Low Potential.** Reports in the paleontological literature or field surveys by a qualified vertebrate paleontologist may allow determination that some areas or units have low potentials for yielding significant fossils. Such units will be poorly represented by specimens in institutional collections.
- **Undetermined Potential.** Specific areas underlain by sedimentary rock units for which little information is available are considered to have undetermined fossiliferous potentials.

Due to the nature of the fossil record, paleontologists cannot know either the quality or the quantity of fossils present in a given geologic unit prior to natural erosion or human-caused exposure. Therefore, in the absence of surface fossils, it is necessary to assess the sensitivity of rock units based on their known potential to produce scientifically significant fossils elsewhere within the same geologic unit (both within and outside of the study area) or a unit representative of the same depositional environment.

Geologic units were assigned a paleontological sensitivity rating based on the museum records search and literature review. For the area underlying the proposed Project study area, geologic maps and paleontological sensitivity maps were created.

California is naturally divided into the following 12 geomorphic provinces, each distinguished by unique topographic features and geologic formations: (1) the Sierra Nevada, (2) the Klamath Mountains, (3) the Cascade Range, (4) the Modoc Plateau, (5) the Basin and Range, (6) the Mojave Desert, (7) the Colorado Desert, (8) the Peninsular Ranges, (9) the Transverse Ranges, (10) the Coast Ranges, (11) the Great Valley, and (12) the Offshore area. The proposed Project is located in the western region of the Mojave Desert geomorphic province. The Mojave Desert is bounded to the northwest by the Transverse Ranges and to the southwest by the Colorado Desert. The Sierra Nevada and the Basin and Ranges provinces establish the northern boundary and the Nevada state line and Colorado River establish the eastern boundary (Norris and Webb 1976).

The Mojave Desert is an elevated alluvial plain located on a wedge-shaped fault block bounded by the San Andreas and Garlock fault zones to the southwest and north, respectively. The western Mojave Desert is characterized by three major rock groups. The first is the basement complex consisting of a pre-Tertiary granitoid batholith believed to be an extension of the Sierra Nevada batholith (Dibblee 1967). The second is Tertiary-age sedimentary and volcanic rocks mostly of terrestrial origin and consisting of conglomerates, sandstones, shales, carbonates, tuffs and breccias, lava flows, and basaltic and rhyolitic plugs. The third major rock assemblage in the western Mojave Desert is composed of Quaternary alluvial, fluvial, and playa, or lake bed, deposits. Quaternary-age alluvial sediments, largely derived from the San Gabriel Mountains and the Sierra Nevada, were deposited either conformably or, more commonly, unconformably on top of Tertiary- and pre-Tertiary-age rocks. The depth of alluvial deposition ranges from a few feet to possibly several thousand feet in thickness. Both Quaternary and Tertiary-age deposits underlie the proposed Project study area.

Fossils are classified as nonrenewable scientific resources and are protected by various laws, ordinances, regulations, and standards. Professional standards for the assessment and mitigation of adverse impacts on paleontological resources have been established by the Society of Vertebrate Paleontology (1995, 1996). Federal protections for scientifically significant paleontological resources apply to projects if any construction or other related project impacts occur on federally owned or managed lands, involve the crossing of state lines, or are federally funded. Federal protections would apply to paleontological resources within the area of potential effects (APE) for this proposed Project because it is in part federally funded and because a portion of the proposed Project area crosses federal lands administered by BLM. The following federal laws would apply to paleontological resources and are detailed in the paleontological resource assessment report in Appendix L:

- National Environmental Policy Act
- Federal Land Policy and Management Act
- American Antiquities Act
- National Historic Preservation Act
- Code of Federal Regulations Title 43

The Land Use, Conservation, Open Plan Element of the San Bernardino County General Plan addresses paleontological resources under "General Provision 1.10.3: Archaeological, Paleontological, Cultural, and Historical Preservation." Specific guidelines pertaining to paleontological resources include the following and are detailed in Appendix L:

- Policy 25 of the General Provision states, "The County will promote the preservation of cultural and historic resources which provide ties with the past and constitute a heritage value to residents and visitors."
- Implementation Measure L for this Policy states that "the County shall address archaeological and historical resources for discretionary projects in accordance with CEQA."
- Implementation Measure M for this Policy states that "in areas of known paleontological resources, the County should address the preservation of these resources where feasible."
- Policy 3.4 contains a series of specific relevant programs regarding areas of unknown sensitivity.

3.6.2 Affected Environment

3.6.2.1 AMSP and Lockhart Substation

The geology in the project area has been mapped by Jennings et al. (1962) and Bortugno and Spittler (1986) at a scale of 1:250,000. In addition, surficial geologic mapping has been published by Amoroso and Miller (2006) and Dibblee (2008) at a scale of 1:62,500. No larger scale maps (1:24,000) were available for this analysis. According to published geologic mapping, the AMSP site is underlain by Quaternary alluvial and lake bed deposits ranging from Pleistocene (1.8 million years old to 10,000 years before present [B.P.]) to Holocene (10,000 years B.P. to Recent) in age (Table 3.6-1). Surficial deposits of Quaternary alluvial deposits, mapped as “Q,” “Qal,” and “Qa” date from the Latest Pleistocene to Recent and are known as younger alluvium. Quaternary older alluvium, mapped as “Qoa,” dates to the Pleistocene and is present at the subsurface throughout the AMSP/Lockhart Substation area and at the surface immediately south of the AMSP/Lockhart Substation boundaries. Quaternary lake bed deposits, mapped as “Ql,” are present in the northeastern portion of the proposed AMSP/Lockhart Substation site and immediately north of the AMSP/Lockhart Substation boundaries. Much of the surface of the AMSP/Lockhart Substation area is mapped by Amoroso and Miller (2006) as “made land” or artificial fill resulting from extensive agricultural disturbance. For the purposes of this analysis, the geologic units known to occur immediately beneath any surficial disturbances are addressed.

Table 3.6-1: Geologic Units within the Project Area

Age	Geologic Unit	Map Abbreviation	Typical Fossil Types	Paleontological Resource Potential (Sensitivity)
Holocene	Younger surficial alluvium	Qa	None	Low to high (increases with depth)
Pleistocene	Older alluvium	Qoa	Vertebrates	High
Miocene	Tropico Group (basalt)	Tb	None	Low

Source: Paleontological Resources Assessment in Support of the EA of the Abengoa Mojave Solar Project, San Bernardino, California, 2010

Quaternary older alluvial sediments of Pleistocene age (1.8 million years old to 10,000 B.P.) occur both at the surface within portions of the AMSP/Lockhart Substation site (Figure 4, Appendix L) and at depth (Dibblee 2008a, 2008b). Older alluvium within the study area consists of weakly consolidated, moderately to poorly bedded gravel, sand, and silt light gray to buff in color. These deposits are locally dissected and in part indurated by white caliche (Dibblee 2008a). Pleistocene-aged alluvium has proven to yield scientifically significant vertebrate fossils both within the region and throughout Southern California. Sediments of similar or the same lithologic composition throughout the areas of Barstow and Lenwood to the east as well as Victorville to the south have also been proven to yield significant fossil localities; thus, this unit is determined to have a high potential for paleontological resources (Whistler 1990; Scott 2009).

The youngest geologic unit found within the AMSP/Lockhart Substation area is Quaternary alluvium of Holocene age to latest Pleistocene in age (Bortugno and Spittler 1986; Dibblee 2008a, 2008b). These sediments, making up the majority of the surficial deposits within the AMSP/Lockhart Substation area (Figures 2 through 4, Appendix L), are composed of unconsolidated and poorly sorted stream, fan, and basin deposits ranging from clay to boulder in size (Bortugno and Spittler 1986). Although the uppermost sediments of Holocene age may contain the remains of modern organisms, they are too young to contain significant paleontological resources. However, underlying Pleistocene-age sediments are considered to have a high paleontological sensitivity. Therefore, Quaternary younger alluvium within the AMSP/Lockhart Substation area is assigned a paleontological sensitivity ranging from low to high, increasing with age (i.e., depth).

A review of the Regional Paleontologic Locality Inventory maintained by the San Bernardino County Museum revealed that 18 vertebrate localities have been previously recorded and collected during a prior mitigation project within the AMSP/Lockhart Substation area. These localities yielded specimens of small terrestrial vertebrates such as pocket mouse, jackrabbit, deer mouse, pocket gopher, kangaroo rat, squirrel, cottontail rabbit, and packrat as well as bird, reptile, and a few mostly indeterminate large mammal specimens (Table 3.6-2). Eleven of the localities reported a depth of discovery ranging from 3 to 14 feet below the ground surface; four localities were reportedly surficial localities and seven localities did not report depth of discovery. All specimens were of extant species, and no time-diagnostic taxa were identified from any of these localities; therefore, the age of the material cannot be conclusively determined. The Society of Vertebrate Paleontology (1995) defines paleontological resources as "older than recorded history and/or older than 5,000 years BP." Since all identified taxa from these localities are also present in the region in modern times, their presumed age of greater than 5,000 years B.P. cannot be verified (Scott 2009).

Table 3.6-2: Previously Recorded Fossil Localities within the Project Area

Geological Formation	Museum Locality Number	Taxon	Common Name
Quaternary alluvium	SBCM 1.115.1	Mammalia (large)	Mammal
	SBCM 1.115.2	Mammalia (large)	Mammal
	SBCM 1.115.3	?Artiodactyla	Even-toed ungulate
	SBCM 1.115.4	Mammalia (large)	Mammal
	SBCM 1.115.5	Mammalia (small)	Mammal
	SBCM 1.115.6	*Lepus* sp.	Jackrabbit
	SBCM 1.115.7	*Lepus* sp.	Jackrabbit
		Camelidae	Camel
	SBCM 1.115.11	*Thomomys* sp.	Pocket gopher
	SBCM 1.155.422	Rodentia	Rodent
	SBCM 1.155.423	Mammalia (small)	Mammal
		Vertebrata (large)	Vertebrate
	SBCM 1.155.424	*Perognathus* sp.	Pocket mouse
		Dipodomys sp.	Kangaroo rat
		Peromyscus sp.	Deer mouse
		?*Neotoma* sp.	Packrat
		Mammalia (large)	Mammal
		Mammalia (small)	Mammal
	SBCM 1.155.425 SBCM 1.155.426 SBCM 1.155.427	Mammalia (small)	Mammal
		Dipodomys sp.	Kangaroo rat
		Vertebrata (small)	Vertebrate
		Phrynosoma sp.	Horned lizard
		?Iguanidae	Lizard

Geological Formation	Museum Locality Number	Taxon	Common Name
Quaternary alluvium (Continued)		Lacertilia	Lizard
		Lampropeltinae	Snake
		Crotalus sp.	Rattlesnake
		Sylvilagus sp.	Cottontail rabbit
		?Sciuridae	Squirrel
		Thomomys sp.	Pocket gopher
		Perognathus sp.	Pocket mouse
		Dipodomys sp.	Kangaroo rat
		Mammalia (small)	Mammal
	SBCM 1.155.428	Colubridae	Snake
		Lacertilia	Lizard
		Crotalus sp.	Rattlesnake
		Aves	Bird
		Lepus sp.	Jackrabbit
		Sciuridae (small)	Squirrel
		Thomomys sp.	Pocket gopher
		Perognathus sp.	Pocket mouse
		Dipodomys sp.	Kangaroo rat
		?*Peromyscus* sp.	Deer mouse
		Neotoma sp.	Packrat
		Mammalia (small)	Mammal
	SBCM 1.155.474	Vertebrata (small)	Vertebrate
	SBCM 1.155.475	Vertebrata (small)	Vertebrate
	SBCM 1.155.476	Ophidia	Reptile
		Phrynosoma sp.	Horned lizard
		Lepus sp.	Jackrabbit
		Thomomys sp.	Pocket gopher
		Dipodomys sp.	Kangaroo rat
		Mammalia (small)	Mammal

Source: Paleontological Resources Assessment in Support of the EA of the Abengoa Mojave Solar Project, San Bernardino, California, 2010

3.6.2.2 Telecommunication System

Geologic mapping by Bortugno and Spittler (1986) and Dibblee (2008a, 2008b) indicate that the fiber-optic corridors are underlain by the following geologic units, in approximate ascending stratigraphic order: (1) the Tropico Group of Miocene age (23 million years old to 5.3 million years old, (2) older Quaternary alluvial deposits of Pleistocene age (1.8 million years old to 10,000 B.P.), and (3) younger alluvium of Holocene age (10,000 B.P. to Recent). Table 3.6-1 identifies the characteristics of the geologic units, their associated fossil types, and the potential resource sensitivity.

The paleontological resource report noted that the proposed fiber-optic routes occur in an area where the Tropico Group formation exists. The Tropico Group is made up of Tertiary-age nonmarine and volcanic rocks scattered throughout the western Mojave Desert, exposed mostly in the vicinities of Rosamond, Mojave, and Boron. The group has a maximum exposed thickness of 2,800 feet and is divided into several lithological units of local extent. In general, its lower part is composed of tuffaceous material of rhyolitic composition, and its upper part is composed of coarse stream-laid or fine lacustrine sediments (or both). The Tropico Group overlies the deeply eroded surface of pre-Tertiary granitic basement rocks and is unconformably overlain by Quaternary-age alluvial sediments (Dibblee 1958).

According to geologic mapping by Dibblee (2008a), the fiber-optic routes also traverse a small portion of a basalt unit within the lower part of the Tropico Group in the vicinity of Kramer Hills (see Figure 3 in Appendix L). This unit, mapped as “Tb,” is composed of black nonvesicular massive olivine basalt occurring locally as flows or sills up to 300 feet in thickness. Most volcanic rocks do not have the potential to contain paleontological resources and are not generally suitable for the preservation of fossils due to their molten origin. Therefore, “Tb” is assigned a “low” sensitivity.

3.6.3 Environmental Consequences

In general terms, for geologic units with high potential, full-time monitoring typically is recommended during any project-related ground disturbance. For geologic units with low potential, protection or salvage efforts typically are not required. For geologic units with undetermined potential, field surveys by a qualified paleontologist are usually recommended to specifically determine the paleontologic potential of the rock units present within the study area.

The combined results of the museum records search and literature review indicate that geologic units underlying the proposed Project area have a paleontological sensitivity ranging from low to high. Therefore, development of the proposed Project may potentially result in direct adverse impacts to nonrenewable fossil resources and will require implementation of measures to avoid and minimize impacts to resources.

Construction of the proposed Project has the potential to result in the destruction of surface or subsurface paleontological resources via breakage and crushing related to ground-disturbing activities; ground disturbance has the potential to adversely impact an unknown quantity of fossils that may occur on or underneath the surface in areas containing paleontologically sensitive geologic units. The majority of the proposed Project area is immediately underlain by a surface that is considered to have a low paleontological sensitivity; however, a few areas are considered areas of high sensitivity. Shallow excavations related to the telecommunication system are unlikely to result in adverse impacts to significant paleontological resources, but deeper excavations into the subsurface (3 feet in depth) may potentially have an adverse impact on paleontological resources without proper measures in place. Various activities during construction will require excavations deeper than 3 feet, e.g., foundations/footings for equipment in the power block, footings for solar array structures, and drainage channels. While limited to new and replacement pole locations and trenching areas only, various activities related to the installation of the fiber-optic cable may require trenching, grading, and excavating for pole foundations, as well as borehole drilling for pole installation. Any ground disturbances in areas considered to be paleontologically sensitive may have an adverse impact on paleontological resources and will require implementation of standard preconstruction and during-construction measures. A detailed list of measures is provided in Appendix S and includes such measures as ensuring a paleontological resource specialist is present during site grading and excavation phases, development of a Paleontological Resource Monitoring and Mitigation Plan, preparation of a staff training plan to educate construction crews, and implementation of a recovery program and Paleontological Resources Report if fossils are found.

3.6.3.1 Proposed Action

3.6.3.1.1 AMSP and Lockhart Substation

The construction of the AMSP would require the disturbance of the site over a large area to mass grade the site. It can be assumed that the entire proposed Project site would experience surface disturbance with cut and fill activities as well as foundations. Areas where the power blocks are located, including post foundations for each of the parabolic solar collectors, would require spot excavation to a proposed depth of up to 10 feet and up to 26 feet for drainage canals.

Although the destruction of fossils as a result of human-caused ground disturbance could have a potential impact by making biological records of ancient life unavailable for study by scientists with the implementation of proper measures noted above, these impacts would be substantially reduced.

3.6.3.1.2 Telecommunication System

While most of the proposed fiber-optic system consists of stringing new fiber-optic cable on existing poles, there would be the need for new and replacement poles in a few select areas, as well as trenching for cable conduit in four areas. Ground disturbance is projected to be minimal/shallow; however, implementation of the measures listed above where ground disturbance is proposed (new poles and trenching), will reduce potential impacts to paleontological resources. No adverse impacts are anticipated.

3.4.3.2 No-Action Alternative

Under the No-Action Alternative, DOE would not issue Mojave Solar a loan guarantee for construction of the AMSP, and Mojave Solar would not proceed with the proposed Project. Absent the proposed Project, current land uses would remain at the AMSP/Lockhart Substation site and in the AMSP telecommunication system corridor. There would be no impacts to paleontological resources under the No-Action Alternative.

3.7 Water Resources

3.7.1 Regulatory Framework

Federal, state, county, and local Laws and ordinances applicable to water resources are listed below and discussed in detail in Appendix E.

- Clean Water Act (CWA)
- EO 11990 Protection of Wetlands
- EO 11988 Floodplain Management and Protection
- DOE Floodplain and Wetland Environmental Review Requirements (10 CFR Part 1022)
- California Constitution
- Porter-Cologne Water Quality Control Act
- California Storm Water Permitting Program
- California Water Code (various sections)
- State Water Resources Control Board Resolution 75-58
- California Code of Regulations
- CEC Policy
- San Bernardino County Ordinance Code (various chapters)

Federal and state laws and EOs that relate specifically to surface water, wetlands, and floodplains are identified below.

3.7.1.1 Surface Water

The CWA of 1972, as amended (33 U.S.C. 1251 et seq.), regulates surface water quality in waters of the U.S. The CWA gives USEPA the authority to set standards for discharge of point source pollutants and set water quality standards for all contaminants in surface waters. USEPA publishes surface water quality standards and toxic pollutant criteria at 40 CFR Part 131.

The CWA mandates water-quality-based control measures. States, territories, and authorized tribes set water quality standards; under CWA Section 303(d), states, territories, and tribes are required to develop lists of impaired waters that do not meet water quality standards and establish total maximum daily loads (TMDLs) for specific pollutants.

TMDLs represent the maximum amount of a pollutant that a water body can receive from all contributing point and nonpoint sources and still meet water quality standards. The calculation must include a margin of safety to ensure that the water body can be used for the purposes the state has designated and must account for seasonal variations in water quality to gain USEPA approval. In addition, the Porter-Cologne Water Quality Control Act (California Water Code Division 7, Chapter 1, Section 13000 et seq.) requires the California State Water Resources Control Board and the nine Regional Water Quality Control Boards (RWQCBs) to adopt water quality criteria to protect state waters, including identification of beneficial uses, narrative and numerical water quality standards, and implementation procedures.

The CWA implemented by the California Storm Water Permitting Program requires that construction activities that disturb 1 acre or more are required to obtain coverage under California's General Construction Permit, which requires the development and implementation of a SWPPP.

3.7.1.2 Wetlands

EO 11990, *Protection of Wetlands* (May 24, 1977 [as amended by EO 12608, September 9, 1987]), directs federal agencies responsible for preparing implementing procedures for carrying out the provisions of the EO. The purpose of this EO is to "minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands." Each agency, to the extent permitted by law, must avoid undertaking or providing assistance to any activity located in wetlands unless the head of the agency finds: there is no practical alternative to such activity; the proposed action includes all practical measures to minimize harm to wetlands that may result from such use. In making this finding, the head of the agency may take into account economic, environmental, and other pertinent factors. Each agency must also provide opportunity for early public review of any plans or proposals for new construction in wetlands. Under DOE policy, a wetlands assessment is required for any action involving wetlands (10 CFR 1022).

3.7.1.3 Floodplains

EO 11988, *Floodplain Management and Protection* (May 24, 1977), directs federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. Under DOE policy, a floodplain assessment is required for any action involving floodplains (10 CFR 1022).

3.7.1.4 Waters of the United States

The Federal Water Pollution Control Act was first passed by Congress in 1948. The Act was later amended and became known as the Clean Water Act. The CWA establishes the basic structure for regulating discharges of pollutants into the waters of the U.S. It gives USEPA the authority to implement pollution control programs, including setting wastewater standards for industry and water quality standards for contaminants in surface waters. Pursuant to Section 404 of the CWA, the U.S. Army Corps of Engineers (USACE) is authorized to regulate any activity that would result in the discharge of dredged or fill material into jurisdictional waters of the U.S., which include those waters listed in 33 CFR 328.3 (Definitions). USACE, with oversight by USEPA, has the principal authority to issue CWA Section 404 Permits.

Pursuant to Section 401 of the CWA, RWQCB certifies that any discharge into jurisdictional waters of the U.S. will comply with state water quality standards. RWQCB, as delegated by USEPA, has the principal authority to issue a CWA Section 401 water quality certification or waiver.

State Waters

Pursuant to Section 1600 et seq. of the California Fish and Game Code, the California Department of Fish and Game (CDFG) is authorized to regulate any activity that would alter the flow, bed, channel, or bank of streams and lakes. Jurisdictional waters of the state include the channel, bed, or bank of a lake, river, or stream. In practice, CDFG usually extends its jurisdictional limit to the top of the bank of a stream or lake or to the continuous outer edge of its riparian extent, whichever is wider.

Pursuant to Section 13000 et seq. of the California Water Code (the 1969 Porter-Cologne Water Quality Control Act), RWQCB is authorized to regulate any activity that would result in discharges of waste or fill material to waters of the state, including “isolated” waters and wetlands (e.g., vernal pools and seeps). Waters of the state include any surface or groundwater within the boundaries of the state (California Water Code § 13050[e]). RWQCB also adopts and implements water quality control plans (basin plans) that recognize and are designed to maintain the unique characteristics of each region with regard to natural water quality, actual and potential beneficial uses, maintaining water quality, and addressing the water quality problems of that region.

3.7.1.5 Groundwater

California Water Code Division 7, Chapter 10 requires a well completion report for constructing, altering, or destroying a water well, and San Bernardino County Ordinance Code, Title 3, Division 3, Chapter 6 describes the requirements for permitting, siting, constructing, and destroying groundwater wells as well as water quality standards and requirements for the inspections of wells.

3.7.2 Affected Environment

The affected environment for the proposed Project addresses the regional setting for surface waters, wetlands, floodplains, and groundwater. Due to the regional nature of water resources in the study area, the following affected environment discussion covers all project components: the AMSP, Lockhart Substation, interconnection, and telecommunication system study areas.

3.7.2.1 Surface Water

The proposed Project is located within the Harper Valley Groundwater Basin, a part of the Centro Sub-Basin of the Mojave River Basin. The Harper Valley Groundwater Basin comprises about 640 square miles (410,000 acres) and includes a small portion of Kern County, with most of the basin within San Bernardino County. The Harper Valley Groundwater Basin is centered on Harper Dry Lake, a dry lake bed with a surface elevation of about 2,025 feet amsl. The proposed AMSP and Lockhart Substation and interconnection elements of the proposed Project are near Harper Dry Lake, as shown in Figure 3.7-1. For the groundwater modeling conducted for the AMSP/Lockhart Substation site, only a portion of the Harper Valley Groundwater Basin was included in the modeling. The area of the Harper Valley Groundwater Basin included in the modeling domain is approximately 411 square miles and is a subset of the Harper Valley Groundwater Basin.

The Mojave Desert is characterized by barren mountain ranges and isolated hills with broad alluvial-filled valleys. The AMSP/Lockhart Substation site is relatively flat with a very gentle downward slope toward Harper Dry Lake to the north-northeast. Portions of the solar plant site have recently been used for agriculture purposes, with remnant irrigation equipment and both active and inactive water wells still present. Ground surface elevations within the main footprint of the AMSP and Lockhart Substation range from about 2,030 feet amsl at the northeastern edge of the site near Harper Dry Lake to about 2,100 feet amsl at the southwestern corner of the site. Topography is shown in Figure 3.7-2.

The Mojave River channel is located approximately 11 miles southeast of Harper Dry Lake. The headwaters for the ephemeral Mojave River lie approximately 40 to 50 miles south of the Harper Dry Lake area within the high mountains of the central Transverse Ranges. The Mojave River is generally dry, although infrequent storms with significant precipitation may result in flow in the river channel. These storms typically occur during winter months. Recharge from the Mojave River to the Harper Valley Groundwater Basin aquifers may occur, but is expected to be minor, and likely only occurs during these episodic storm flows. One of the proposed fiber-optic routes spans over the Mojave River on existing transmission line poles.

The Harper Valley Groundwater Basin is drained by numerous ephemeral steams sloping toward Harper Dry Lake. The Harper Valley Groundwater Basin is a closed basin with no outlet. Annual precipitation ranges from about 3 to 7 inches with highland areas receiving more precipitation and basin areas receiving less.

3.7.2.2 Wetlands

The only wetland feature in the AMSP/Lockhart Substation study area is a lacustrine marsh located at the southwestern edge of Harper Dry Lake less than 1 mile north of the proposed AMSP/Lockhart Substation site. This marsh is also known as the Harper Dry Lake Wetlands. This semi-perennial marsh has had maximum dimensions of about 2 miles long and 0.25 mile wide. In the past, the area received its water supply from surface water and agricultural runoff. With significant decline in Harper Dry Lake area agriculture, the marsh has been artificially maintained with groundwater pumped by BLM from a former irrigation well now owned by Mojave Solar.

The proposed fiber-optic routes will not cross wetland habitats.

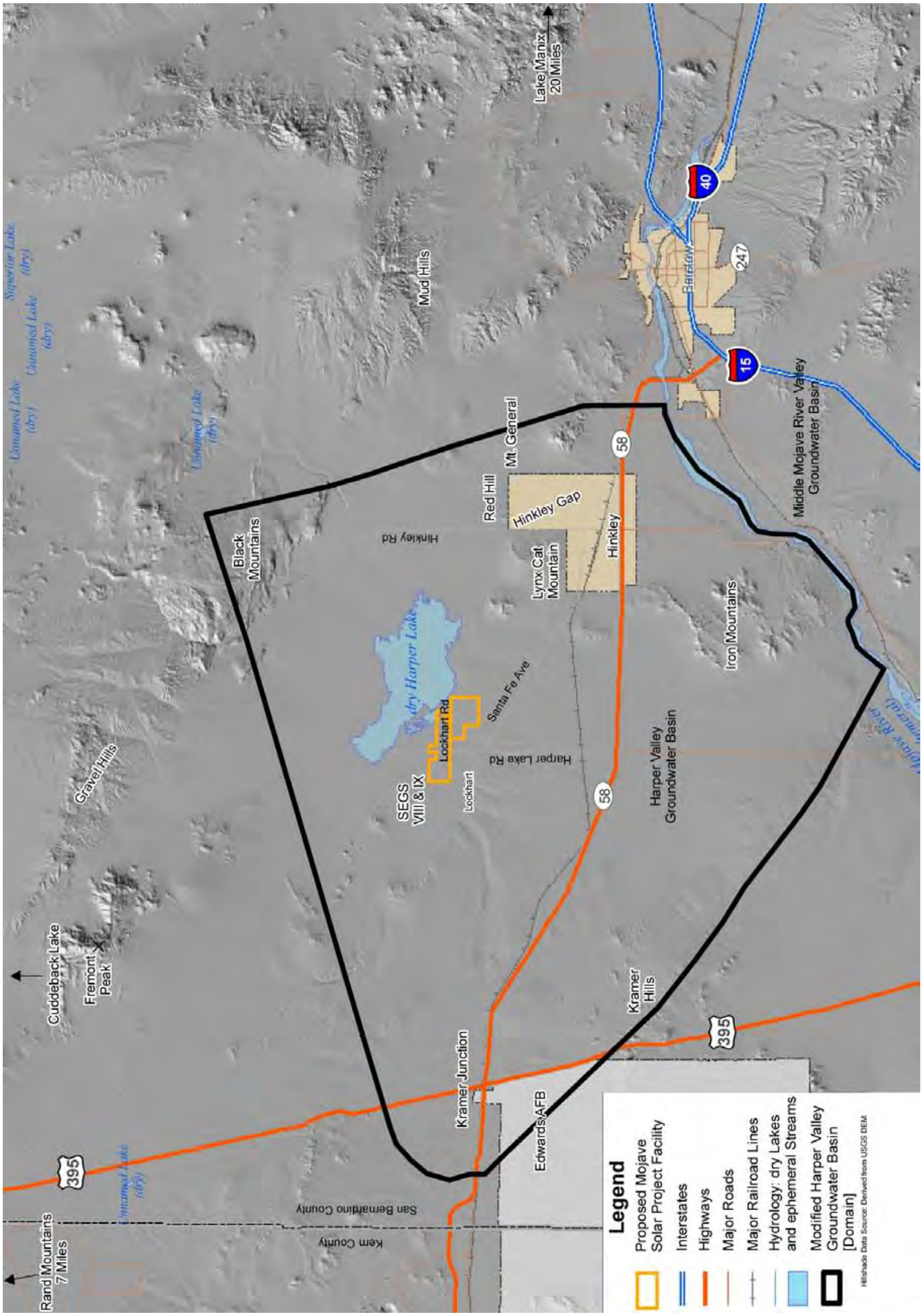

Figure 3.7-1: Harper Valley Groundwater Basin

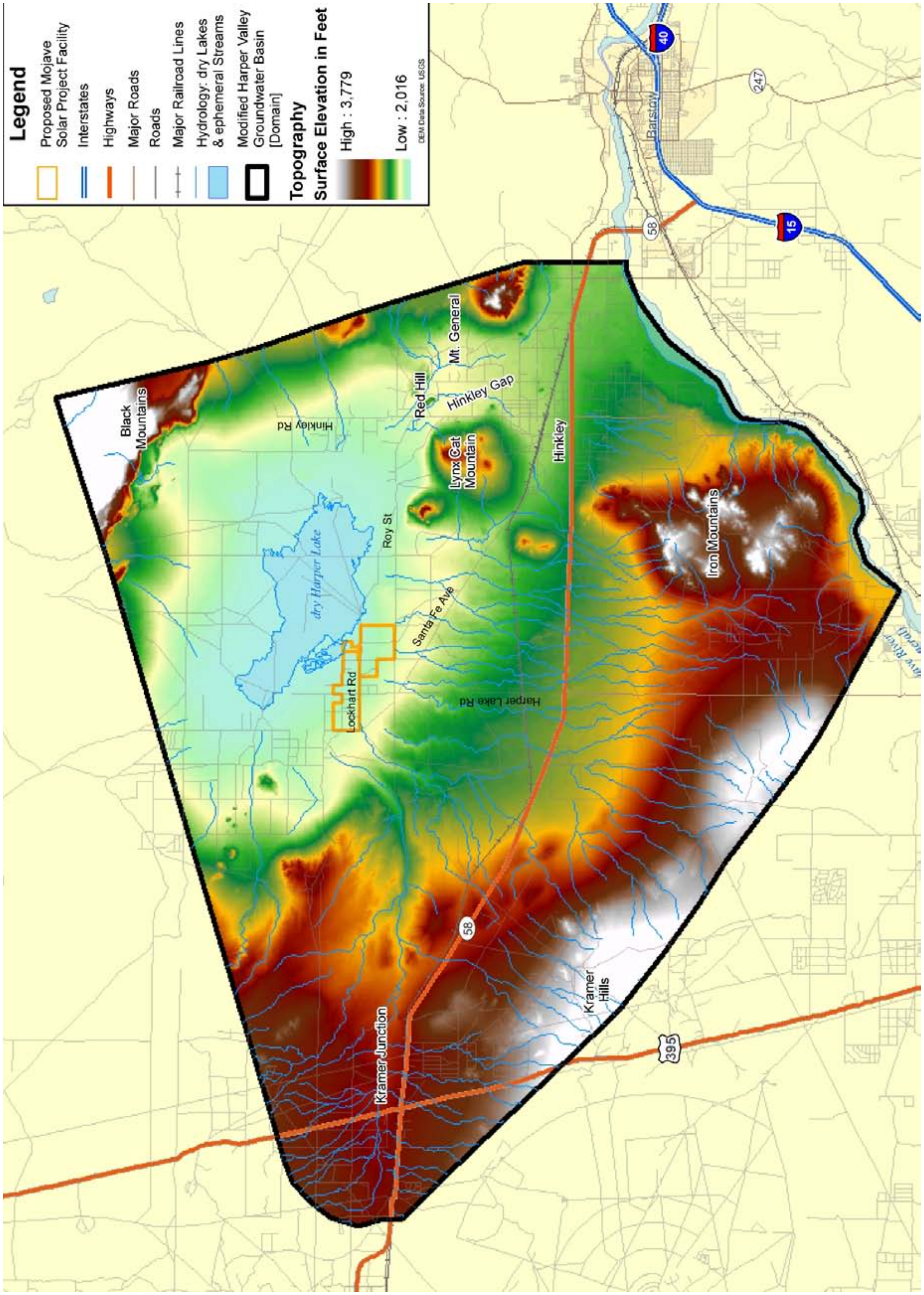

Figure 3.7-2: Topography

3.7.2.3 Floodplains

According to the San Bernardino County Flood Control District, the AMSP/Lockhart Substation site is not located within a designated 100-year floodplain, nor is the nearby Harper Dry Lake area. As shown in Figures E-1 and E-2 in Appendix E, only one segment of the proposed fiber-optic telecommunication line crosses a Federal Emergency Management Agency-designated 100-year floodplain. A portion of the Lockhart-Tortilla Telecommunication line crosses over the Mojave River, which falls within a 100-year flood zone (refer to Figure E-1). The southern portion of the Kramer-Victor Telecommunication line traverses near but not within the limits of another 100-year flood plain (Figure E-2).

3.7.2.4 Waters of the U.S.

Jurisdictional waters of the U.S. include those waters listed in 33 CFR 328.3. All waters of the U.S. were delineated to their jurisdictional limits as defined by 33 CFR 328.4. *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States: A Delineation Manual* (USACE 2008).

AMSP and Lockhart Substation

Although the entire AMSP area was surveyed and assessed for jurisdictional waters of the U.S. and state (including wetlands), it was determined through field reconnaissance and assessment that only the portion of the ASMP/Lockhart Substation study area (buffer) that overlaps a portion of Harper Dry Lake has the potential to include federally regulated waters.

AECOM ecologists conducted a formal field delineation for potential jurisdictional waters of the U.S. and state utilizing the latest federal and state guidance documents, methodologies, and mapping standards. Based on the delineation, it was determined that the extent and distribution of the collective area of potential jurisdictional waters of the U.S. occurring within the AMSP/Lockhart Substation study area is 11.03 acres and is associated with the Playa lakebed and tamarisk scrub (refer to Figure E-3 in Appendix E). However, USACE determined that there were no waters of the U.S. present on the ASMP/Lockhart Substation site and that the potential waters of the U.S. associated with the playa lakebed and tamarisk scrub were isolated.

Telecommunication System

AECOM ecologists conducted a formal field delineation for potential jurisdictional waters of the U.S. and state utilizing the latest federal and state guidance documents, methodologies, and mapping standards. The extent and distribution of the collective area of potential jurisdictional waters of the U.S. (as well as state) is 20.44 acres. This represents the total area within the fiber-optic/transmission line corridor. An additional 14.96 acres was determined to fall under the category of state waters only. An official determination of absence or presence (including final acreages) of jurisdictional waters of the U.S. will be based on the USACE/USEPA jurisdictional determination process.

3.7.2.5 Waters of the State

Jurisdictional waters of the State include those waters of the U.S., as defined in "3.7.2.4 Waters of the United States." Additionally, jurisdictional waters of the state were delineated either to the head of the bank. Waters of the state do not always have identifiable hydric soils or clear evidence of wetland hydrology as defined by USACE. Therefore, CDFG jurisdictional boundaries often extend beyond USACE jurisdictional boundaries.

AMSP and Lockhart Substation

During the AFC process, AECOM ecologists were able to demonstrate that the AMSP footprint (including the Lockhart Substation) would not impact any topographic feature that could be considered a water of the state. The AMSP/Lockhart Substation site's former agricultural operations has resulted in stormwater surface runoff to cross the site as sheetflow, without following any channels that could be construed as being a jurisdictional water of the state.

Telecommunication System

AECOM ecologists conducted a formal field delineation for potential jurisdictional waters of the U.S. and state utilizing the latest federal and state guidance documents, methodologies, and mapping standards. The extent and distribution of the collective area of potential jurisdictional waters of the state is 35.4 acres (subsumed within that acreage value is 20.44 acres of waters of the U.S.). This represents the total area within the fiber-optic/transmission line corridor. An official determination of absence or presence (including final acreages) of jurisdictional waters of the state will be based on the CDFG Streambed Alteration Application review process.

3.7.2.6 Groundwater

Water resources, and their occurrence and use, are complicated issues in the Mojave Desert. Groundwater within the desert provides an important resource for domestic, agriculture, commercial, and industrial use and often supplements imported water from the State Water Project or Colorado River. Groundwater within the Harper Valley Groundwater Basin is managed by the Mojave Water Agency and Harper Valley Groundwater Basin groundwater is a key domestic water resource.

Groundwater hydraulic information for the Harper Valley Groundwater Basin was obtained from readily available literature sources, existing and historical water wells, available geophysical surveys, geologic cross sections, and quantitative hydraulic values derived from aquifer pumping tests. Relevant information includes groundwater elevations, groundwater flow patterns, recharge, sinks, aquifer thickness, identification of aquitards (geologic formation that retards water flow), aquifer transmissivity, and the aquifer storage coefficient. Additional

Information related to groundwater, hydrogeology, aquifer properties, aquifer testing, groundwater geochemistry, water budgets, and groundwater modeling is presented within the Basin Conceptual Model report (CEC 2009).

Quaternary lacustrine and alluvial deposits, including unconsolidated younger fan material and unconsolidated to semi-consolidated older alluvium, can be water bearing within the basin. The older alluvium is the most important water-bearing stratum in the basin, with average well yields reported at about 725 gallons per minute (gpm) with a maximum of 3,000 gpm (California Department of Water Resources 1975). Groundwater within the basin is generally unconfined, although confined conditions are found near Harper Dry Lake (California Department of Water Resources 1971). The total storage capacity of the Harper Valley Groundwater Basin is estimated to be 6,975,000 acre-feet (California Department of Water Resources 1975).

Within the Mojave River Basin and Harper Valley Groundwater Basin, two aquifers are recognized by the USGS and Mojave Water Agency. These aquifers are commonly identified as the Floodplain Aquifer and the Regional Aquifer and are hydraulically connected. Since the Mojave River is a losing stream (a stream or river that loses water as it flows downstream, because the water table is below the bottom of the stream channel), vertical groundwater flow is from the shallow Floodplain Aquifer to the Regional Aquifer (also known as the QaL Aquifer). Transmissivity is significantly larger within the Floodplain Aquifer than within the Regional Aquifer. Nonetheless, relatively large yields (≥ 1,000 gpm) have been documented from water wells completed within the Regional Aquifer near Harper Dry Lake.

As shown in Figures 3.7-3 and 3.7-4, groundwater flow within the Harper Valley Groundwater Basin is generally toward the AMSP/Lockhart Substation site. The proposed AMSP would use groundwater produced from the upper portion of the Regional Aquifer, known as the uQal. The depth to groundwater beneath the proposed AMSP footprint is about 125 to 145 feet below ground surface. A geologic cross section showing the location of the uQal is shown in Figure 3.7-5.

As shown in Figure 3.7-6, groundwater quality within the Harper Valley Groundwater Basin is generally marginal to inferior for irrigation and domestic uses because concentrations of boron, fluoride, and sodium are elevated. General groundwater quality information for the Harper Valley Groundwater Basin is summarized below (California Department of Water Resources 1964):

- Reports from the west side indicate uneven mixtures of sodium, chloride, bicarbonate, and sulfate, with TDS content as high as 2,390 micrograms per liter (mg/L); elevated concentrations of fluoride, boron and sulfate have been reported.
- The southern side is of calcium-sodium sulfate character with high sulfate, boron, and TDS concentrations.

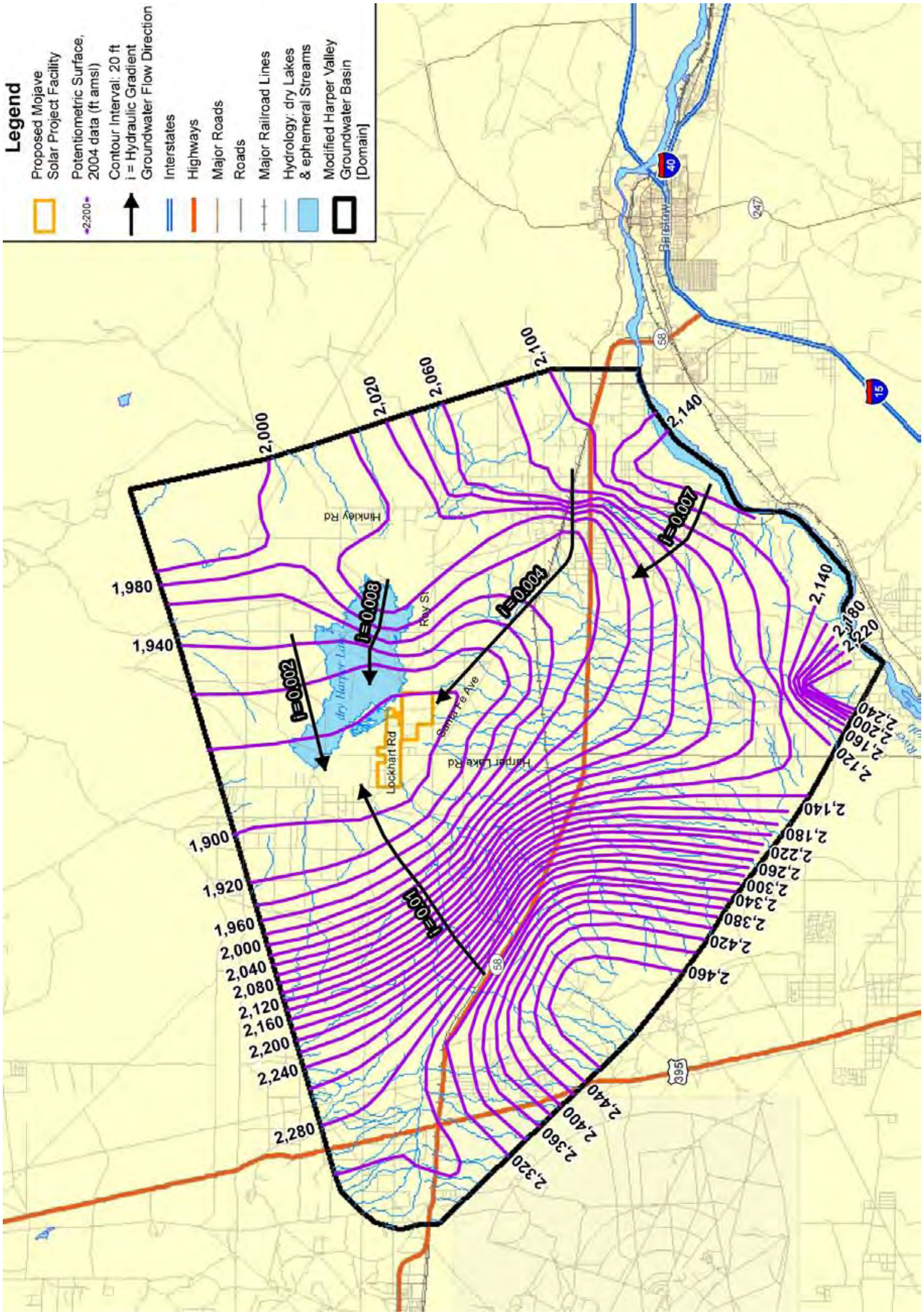

Figure 3.7-3: Groundwater Flow (2004)

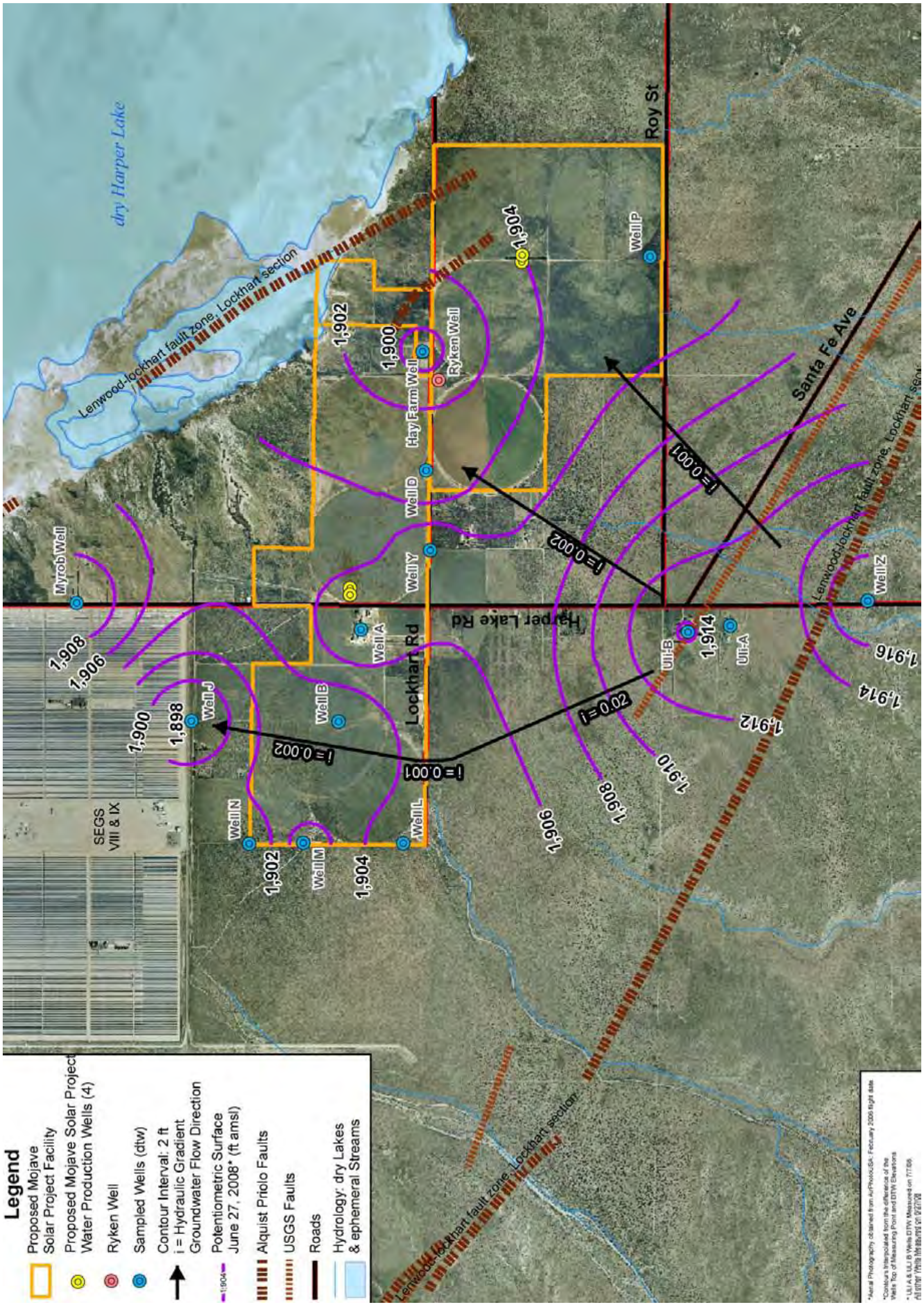

Figure 3.7-4: Groundwater Flow (2008)

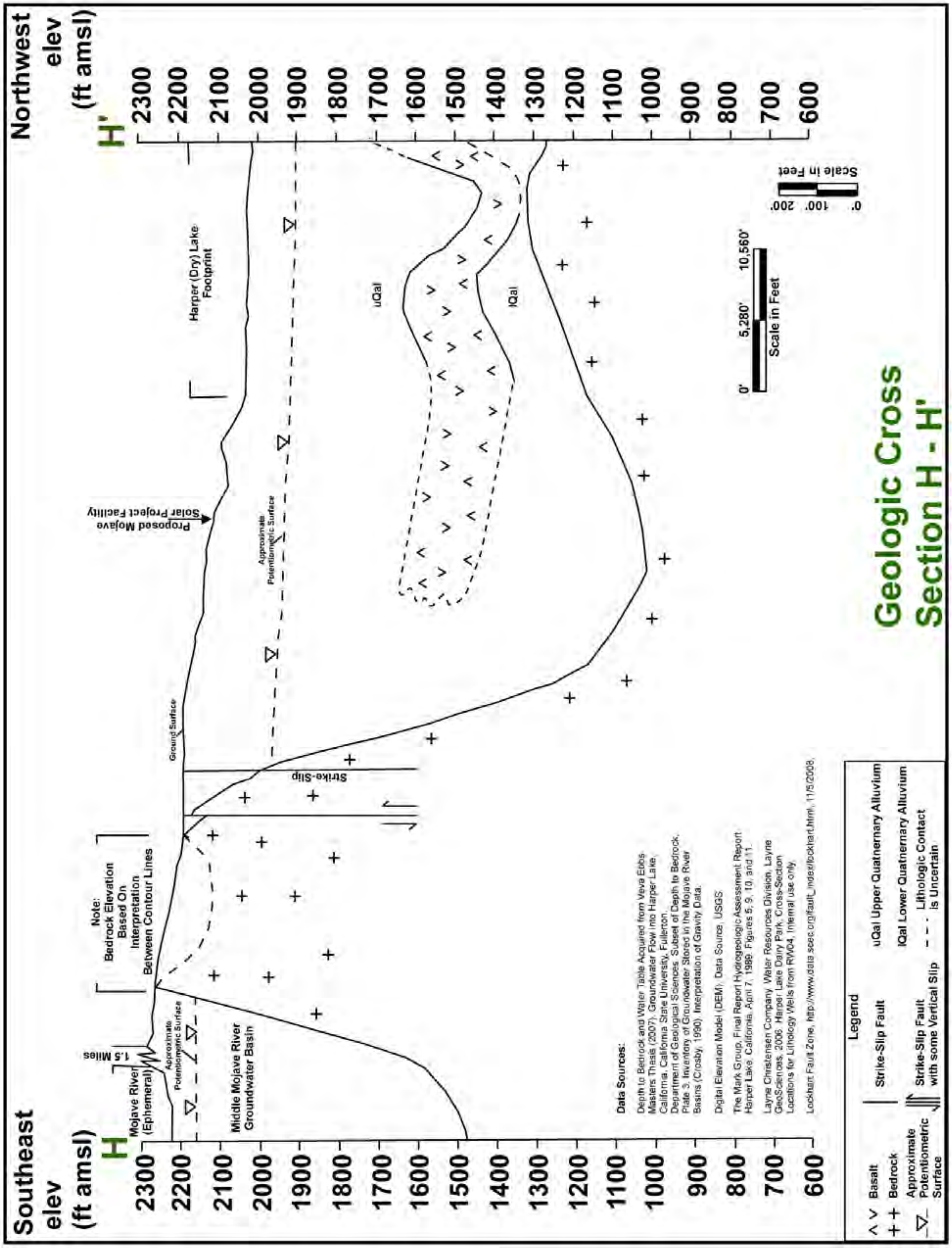

Figure 3.7-5: Geologic Cross Section H-H'

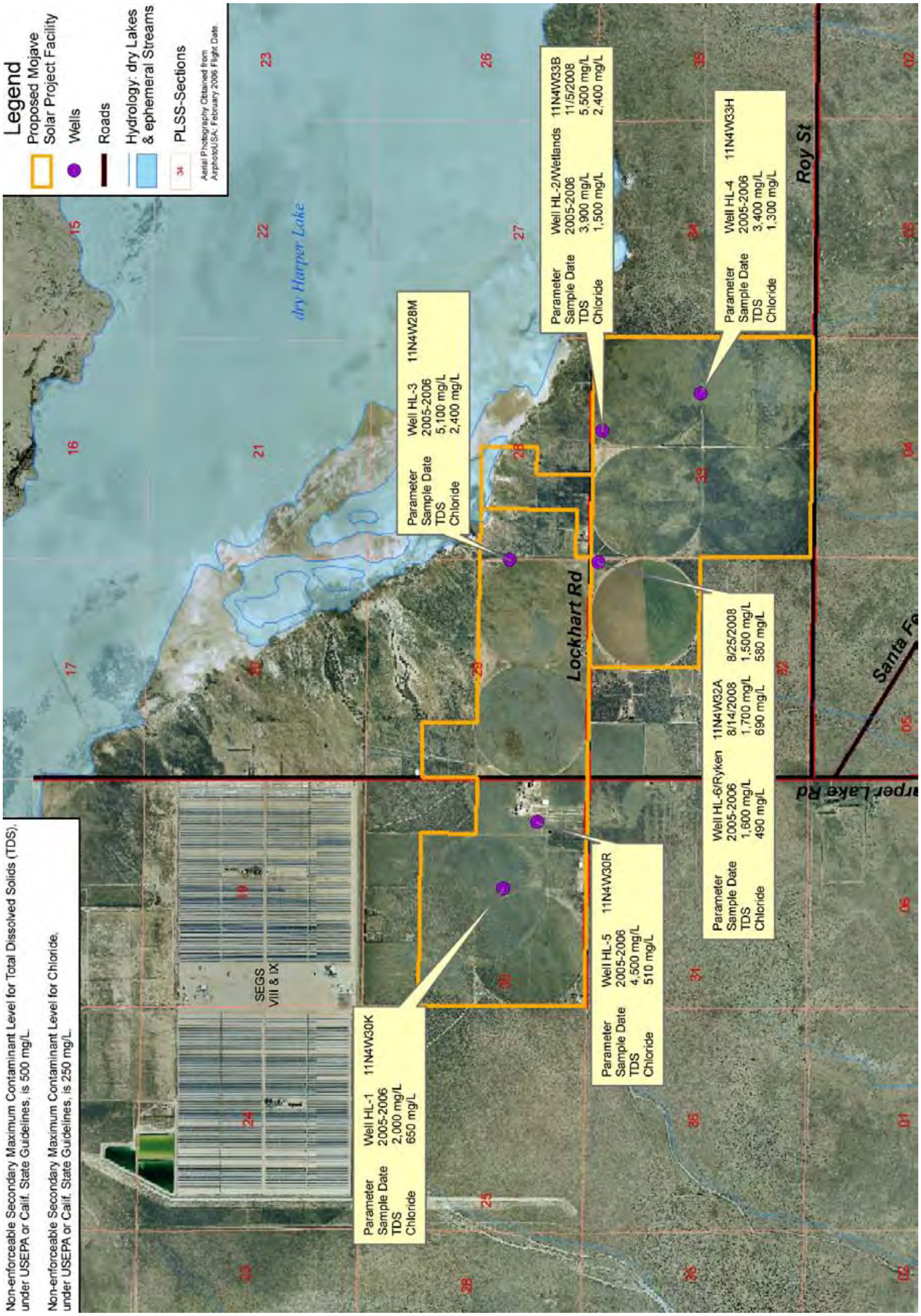

Figure 3.7-6: Groundwater Quality

- The northern side is of sodium sulfate-bicarbonate character with relatively high concentrations of sodium, fluoride, and boron.
- The eastern side (i.e., proposed AMSP) is of a sulfate-chloride character, with chloride ranging from about 500 mg/L to 2,400 mg/L and sulfate ranging from 350 mg/L to about 600 mg/L; boron and iron concentrations also tend to be elevated; reports of TDS ranged from about 1,600 mg/L to 5,500 mg/L.
- Groundwater targeted as the make-up water for cooling electricity generation equipment at the proposed AMSP is not potable and would require treatment prior to drinking.

Advisory information regarding general groundwater quality for the proposed AMSP area is summarized below:

- Groundwater TDS concentrations appear to increase as distance from the well to the present-day playa decreases.
- Perched groundwater caused by historical and current agriculture irrigation may be common in the proposed AMSP area. Agricultural source perched water often contains elevated TDS concentrations. Improperly designed or constructed wells, both abandoned and active, provide a vertical conduit between perched groundwater and the uQal Aquifer.
- Proper well design and construction eliminate vertical connections between perched groundwater and the uQal Aquifer and thereby reduce the TDS concentration of produced groundwater.

Residential and production wells in proximity to the AMSP site are shown in Figure 3.7-7.

Groundwater would not be used or affected by the proposed fiber-optic lines; groundwater depth, quantity, and quality were not evaluated for the fiber-optic routes.

3.7.3 Environmental Consequences

The following environmental consequences analysis focuses on potential short- and long-term impacts to groundwater supply and quality, as well as to surface water quality from proposed Project construction and operations. In addition, potential impacts to floodplains and wetlands are assessed. The CEC Conditions of Certification for the AMSP were taken into consideration for the following analysis. A composite list of conditions is provided in Appendix E.

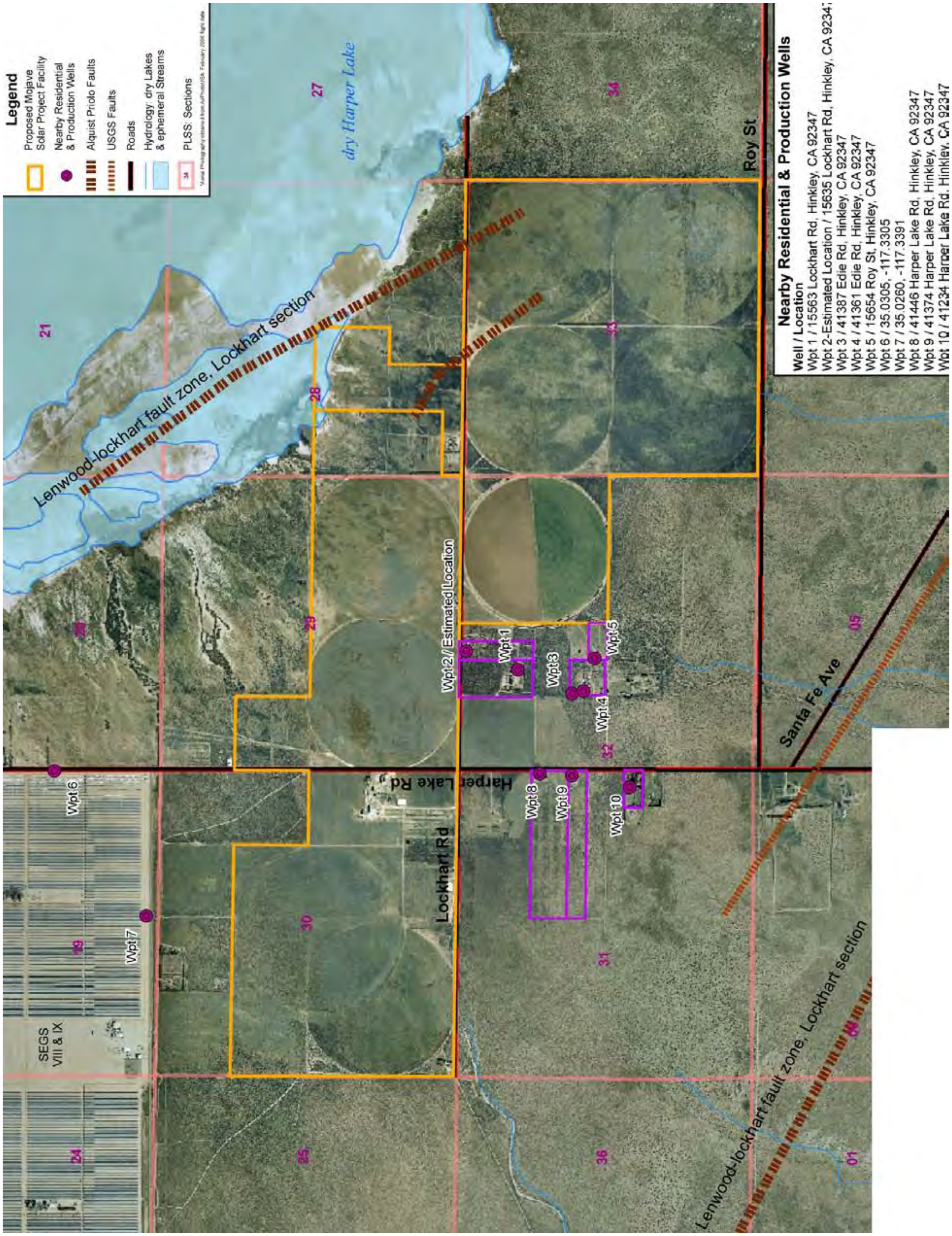

Figure 3.7-7: Residential and Production Wells

3.7.3.1 Proposed Action

3.7.3.1.1 Surface Water and Storm Water

AMSP and Lockhart Substation

Construction

The AMSP Applicant is proposing to clear and grade the AMSP/Lockhart Substation site with heavy equipment to provide a terraced site with gentle northerly and easterly sloping grades on each terrace. The cut and fill is proposed to be balanced and there are no plans to import fill material during general grading operations. Overall, the AMSP and Lockhart Substation construction would result in disturbance of approximately 1,765 acres. Because of the amount of soil and vegetation affected by grading activities, substantial erosion and dust control measures would be implemented to minimize offsite impacts. The construction phase SWPPP and Drainage, Erosion, and Sediment Control Plan would include a series of management controls and BMPs to minimize erosion and impacts to drainage from construction of the AMSP, as well as to any SCE elements if applicable.

Site grading activities would be ongoing for the first 6 months of the construction schedule. During this time, grading would proceed in increments, from one area to the next until the entire site grading was completed. Drainage channels are proposed to be constructed around the perimeter of the AMSP/Lockhart Substation site to intercept offsite runoff from storm events. During the grading phase, site drainage would be managed according to the BMPs provided in the construction SWPPP, and the Drainage, Erosion, and Sediment Control Plan would be employed to minimize erosion and manage stormwater runoff, as applicable. Though infiltration at the site is expected to be rapid, measures would be implemented, including local soil berms within the collector fields to contain stormwater runoff water during construction. Temporary erosion control including crushed rock, silt fences, and fiber rolls would be employed to minimize erosion as well. Additionally, water would be used to control fugitive dust emissions and applied at a rate to minimize runoff.

Potential water quality impacts could result from release of chemicals used during construction and operation, such as motor oil, fuel, and solvents. These chemicals can potentially contaminate surface waters during heavy storm events or affect groundwater through infiltration. Measures are proposed to be implemented to prevent spills of chemicals, as well as to respond to spills should they occur. The SWPPP and Drainage, Erosion, and Sediment Control Plan require stormwater BMPs and temporary erosion control measures, including revegetation, dust suppression, and construction of berms and ditches, which will prevent accelerated soil erosion or dust generation. Adhering to proper material handling procedures and complying with the SWPPP will ensure that construction-related water quality impacts are not adverse.

Products that have the potential to contaminate groundwater and surface water would be properly stored and used in a manner consistent with the approved grading plan, SWPPP, and Drainage, Erosion, and Sediment Control Plan. Good housekeeping and prompt removal of spills and leaks would minimize storm water contact with contaminated materials. With the implementation of BMPs and procedures and protocols provided in the Drainage, Erosion, and Sediment Control Plan, it is anticipated that during construction, drainage and erosion control measures would adequately protect surface and groundwater resources and impacts would be avoided.

Operation

The AMSP/Lockhart Substation site slopes from the southwest toward the northeast at grades of approximately 1%. Storm runoff flow, in the form of sheet flow, across the AMSP/Lockhart Substation site would be intercepted as it enters the site, is conveyed around the site perimeter, and returns to its historical flow location and parameters as it flows into Harper Dry Lake. Offsite storm runoff flow around the AMSP/Lockhart Substation site would be isolated from onsite flows. Sheet flow within the solar field would be managed through the construction of internal drainage facilities designed to capture storm water and allow it to percolate and evaporate within the fields. The power islands would drain as sheet flow away from equipment foundations and would be intercepted, treated using oil-water separators to remove potential pollutants, and discharged to the evaporation ponds. Local area containments would be provided as needed around equipment such as oil-filled transformers and chemical storage areas.

A hydrology study was conducted to provide a preliminary design of onsite and offsite surface water drainage structures. The drainage channel proposed along the upstream (southern) plant boundary was designed for flows up to 14,800 cfs. The recommended outlet structure of the channel consists of a “spreading ground” encompassing approximately 30 acres and designed to transition storm runoff from a concentrated flow to sheet flow to match the historical nature of runoff flow even during a 100-year storm event. The channel outfall is proposed to be located in the northeastern portion of the AMSP site, adjacent to Harper Dry Lake.

The proposed Lockhart Substation would be located within the boundaries of the AMSP property. Water resource impacts associated with groundwater, hydrogeology, surface flows, flood control, and water quality as a result of developing the substation were considered in the above analysis for the solar plant. No adverse impacts were identified and implementation of BMPs for the AMSP and Lockhart Substation would minimize impacts and reduce potential adverse impacts. A complete list of BMPs is provided in Appendix S and includes measures such as grading in phases to limit the amount of disturbed surfaces, utilizing berms to control sediment loss, using stabilized construction roads and water trucks to suppress construction road dust, and routine maintenance of storm water channels.

With the implementation of BMPs, it is anticipated that the AMSP and Lockhart Substation impacts to drainage and flood control would be effectively minimized.

No surface water would be used for dust control during construction or for cooling purposes during operation.

Telecommunication System

A majority of the offsite improvements consist of stringing cable on existing transmission line poles, where impacts are limited to short-term construction impacts. No grading is proposed for the cable-pulling activities, and no impacts to existing drainages, surface, or subsurface water sources are anticipated during the construction phase. SCE has determined that seven existing poles would need to be replaced (three on the Lockhart-Tortilla route and four on the Lockhart-Kramer route. These poles are located outside of jurisdictional waters of the U.S. and state. The telecommunication system will also require the installation of approximately 30 new interset poles on the Kramer-Victor line. The exact location of these poles has yet to be determined. However, drainages that would be potentially under the jurisdiction of USACE have been delineated and mapped. This information will be used by SCE to locate the interset poles in areas where they avoid impacting USACE drainages. In areas where the new interset poles may be near drainages, crews will further verify in the field the location of the drainages and adjust the poles to avoid the resources to the maximum extent possible.

Trenching is proposed to install the cable in underground conduit in four areas: one area is along Harper Lake Road on the Lockhart-Tortilla route, and there are three locations on the Kramer-Victor route. Trenching locations will not impact jurisdictional waters. The Harper Lake Road section is located along the existing shoulder of the road. The three locations for the Kramer-Victor line are located on the southern end of that route, outside any jurisdictional areas.

As with the existing transmission line poles between Lockhart Substation and the other substations in the region (Tortilla, Kramer, and Victor), the fiber-optic cable would span over any known drainages, resulting in no direct impact to water resources. As an example, fiber-optic cable is proposed to be strung on existing transmission line poles along Lenwood Road, just west of Barstow. The existing transmission line along this road spans the Mojave River. Installation of fiber-optic line on existing poles would not require new grading or surface disturbance. Existing poles would be accessed by foot or by using existing dirt access roads.

Short-term construction activities associated with the trenching would be localized and short term given the minimal excavation proposed and limited distance for trenches. Trenches would be approximately 15 inches wide and 36 inches deep, and stockpiled soils would be replaced back into the trench on the same day as cable installation. Debris and runoff from these activities are not anticipated. Typical BMPs would be implemented should construction occur during inclement weather, such as placing tarps over temporary stockpiles.

There is a potential for some of the interset poles to impact drainages along the Kramer to Victor route. The interset poles would result in a permanent impact of up to 5 square feet per pole, with a cumulative total of less than 0.5 acre. Any impact to drainages/or potential waters of the U.S. will require authorization from USACE. In this case, authorization under a Nationwide Permit would be sought to cover potential impacts associated with the installation of the new interset poles.

3.7.3.1.2 Wetlands

AMSP and Lockhart Substation

The only wetland feature in the AMSP/Lockhart Substation study area is a lacustrine marsh located at the southwestern edge of Harper Dry Lake. The AMSP operations would not discharge water or wastewater to the wetlands and there would be no direct encroachment or impact to the wetlands during project construction. Layne GeoSciences does not expect surface water to be substantively altered due to AMSP or substation construction or operation.

Telecommunication System

No wetlands (as defined by federal or state definitions) occur within the Telecommunication System study area. Fiber-optic cables are proposed to be located within existing electric transmission line corridors and strung primarily on existing poles that span any washes, drainages, or water bodies. New poles and trenching would not be located in wetlands areas.

3.7.3.1.3 Floodplains

AMSP and Lockhart Substation

The AMSP/Lockhart Substation site is not located within a designated 100-year floodplain, nor is the nearby Harper Dry Lake area. No construction is proposed in low-lying areas and no impacts to potential floodplain areas are anticipated.

Telecommunication System

The existing transmission line along the Lockhart to Tortilla route spans the Mojave River 100-year floodplain where the route nears the City of Barstow. According to SCE, there would be no surface disturbance activities (grading or excavation) associated with stringing the fiber-optic line on the existing transmission structures. Crews would access the existing transmission structures by foot or by using existing dirt access roads. No new poles would be constructed within the floodplain. There are no known floodplains associated with the ephemeral drainages that would be crossed by the fiber-optic line and no impacts to floodplains are anticipated.

3.7.3.1.4 Waters of the U.S.

AMSP and Lockhart Substation

The jurisdictional delineation conducted by AECOM determined that potential waters of the U.S. were located coincident with the tamarisk scrub and playa lakebed associated with Harper Lake. USACE determined, however, that the AMSP/Lockhart Substation site does not contain waters of the U.S. and that the potential waters of the U.S. associated with the playa lakebed and tamarisk scrub were in fact isolated in nature and would not be subject to USACE regulations.

Telecommunication System

A majority of the offsite improvements consist of stringing cable on existing transmission line poles, where impacts are limited to short-term construction impacts. No grading is proposed for the cable-pulling activities. SCE has determined that seven existing poles would need to be replaced (three along the Lockhart-Tortilla route and four along the Lockhart-Kramer route). These poles are located outside of potential jurisdictional water resources. The project will also require the installation of approximately 30 new interset poles on the Kramer-Victor line. The locations of these poles are shown in Figure 2-13.

The installation of the interset poles would result in the fill of approximately 5 square feet per pole. It is anticipated that no more than 30 interset poles would impact potential waters of the U.S. This would result in total of 157 square feet of impact. Refer to Figures E-4 and E-5 in Appendix E for maps depicting where the encroachment into federal waters is possible, and Figure E-6 for example methods of avoidance. The Applicant would conduct work under a Nationwide Permit, which covers activities required for the construction, maintenance, repair, and removal of utility lines and associated facilities in waters of the U.S., provided the activity does not result in the loss of greater than 0.5 acre of waters of the U.S. Due to the limited size of the impact to potential jurisdictional waters, the action would qualify for a non-notification action as defined in Nationwide Permit 12.

The remaining interset poles will be located outside of the potential waters of the U.S. SCE will locate the remaining interset poles in areas where they can avoid impacting potential waters of the U.S. In areas where the new interset poles may be near drainages, crews will further verify in the field the location of the drainages, and adjust the pole locations to avoid the resources to the maximum extent possible. Trenching is proposed to install the cable in underground conduit in four areas of the proposed Telecommunication System: one area is along Harper Lake Road on the Lockhart-Tortilla route, and there are three locations on the Kramer-Victor route. The proposed trenching locations would not impact jurisdictional waters. The Harper Lake Road section is located along the existing shoulder of the road and the three locations for the Kramer-Victor line are located outside any potential jurisdictional areas near Adelanto and the Victor Substation.

The project will also need to meet federal water quality certification through the issuance of a CWA Section 401 permit/certification (as regulated by RWQCB).

3.7.3.1.5 State Waters

AMSP and Lockhart Substation

The jurisdictional delineation conducted by AECOM determined that no state waters occur on the AMSP/Lockhart Substation site.

Telecommunication System

Similar to what was described above in “3.7.3.1.4 Waters of the U.S.,” potential impacts associated with the installation of the 30 interset poles and 7 replacement poles could encroach into state waters. Although SCE would provide final engineering designs to avoid state waters to the extent feasible, a Streambed Alteration Agreement application would be submitted to CDFG to address any unavoidable impacts to state waters.

3.7.3.1.6 Groundwater

AMSP and Lockhart Substation

<u>Construction</u>

During construction of the AMSP and Lockhart Substation, water production would be needed for potable water use and nonpotable water use, including grading, dust suppression, sewage, and fire protection. Construction phase water usage is estimated to be between 59,800 and 1,766,050 gallons per day (gpd).

During the construction phase, water is proposed to be produced from three wells, including one well at each of the power blocks and from the “Ryken Well.” All new wells would be completed in accordance with all applicable state and local water well construction requirements.

Water usage for the construction period is expected to proceed along the following schedule:

- Month 1 through 6 – 1,766,050 gpd
- Month 7 through 26 – 59,800 to 61,750 gpd

As can be seen above, following the initial grading period of 6 months groundwater usage would drop dramatically with daily rates ranging from 59,800 to 61,750 gpd.

Hydraulic interference resulting from 26 months of continuous pumping at 410 gpm from each of the three production wells is shown in Figure 3.7-8. Maximum estimated hydraulic interference at positions off the AMSP/Substation site and at a radial distance of 0.5 mile from production wells PW-1a, PW-2b, and the Ryken Well is 5 feet. This interference to potential offsite wells located as close as 0.5 mile from the AMSP supply wells is insignificant. Layne GeoSciences does not expect groundwater production during AMSP and Lockhart Substation construction to adversely impact water levels at neighboring wells.

Available data indicate sufficient quantity of groundwater in storage under current conditions to supply the water requirements needed by the proposed AMSP for its anticipated 30-year life. Additionally, an evaluation of groundwater inputs and outputs indicates AMSP groundwater use would not exceed the water budget. Available aquifer testing data indicate water supply requirements can be met from two properly constructed wells within the AMSP property.

Because of the high transmissivity of the uQal aquifer, prolonged extraction for AMSP supply water should not cause an increase in TDS concentration or deterioration in quality by drawing in water of higher salinity from an expanded pumping depression reaching below Harper Dry Lake. Similarly, the proposed pumping of groundwater to supply the AMSP during construction is not expected to induce additional migration of Mojave River underflow. Approximately 6,500 to 18,000 AFY of groundwater have been used for historical agriculture production in the vicinity of the existing SEGS VIII and IX and the proposed AMSP sites, as compared to the 2,160 AFY needed during operation of the AMSP.

Operation

The proposed AMSP would use a wet cooling tower for power plant cooling. Water for cooling tower makeup, process water makeup, and other industrial uses such as mirror washing would be supplied from selected onsite groundwater wells. Water from the onsite wells would also be used to supply potable water for employees (e.g., drinking, showers, sinks, toilets). Operation of the 250-MW solar electricity generation facility is expected to require 2,160 AFY of water (includes 10 AFY for potable water) for an anticipated 30 years. Figure 3.7-8 shows two wells, a production well and a backup well, located on the north ends of each of the two proposed AMSP power blocks. Supply water between power blocks would not be interconnected and each power block would have dedicated water treatment equipment. To meet the production demand, each well is proposed to be designed for a peak capacity of 1,172 gpm. The required annual water production (i.e., to support 2,160 AFY) has been normalized to a constant flow rate of 670 gpm from each of the two power blocks based on water production 24 hours per day and 7 days per week.

Potential impacts to neighboring property due to water production from two onsite wells was simulated using WinFlow, v. 3, developed by Environmental Simulations, Inc. The predictive simulation lasted 30 years and assumed that each of two production wells was pumped continuously at 670 gpm. A flow rate of 670 gpm from two wells, 24 hours per day for 1 year is

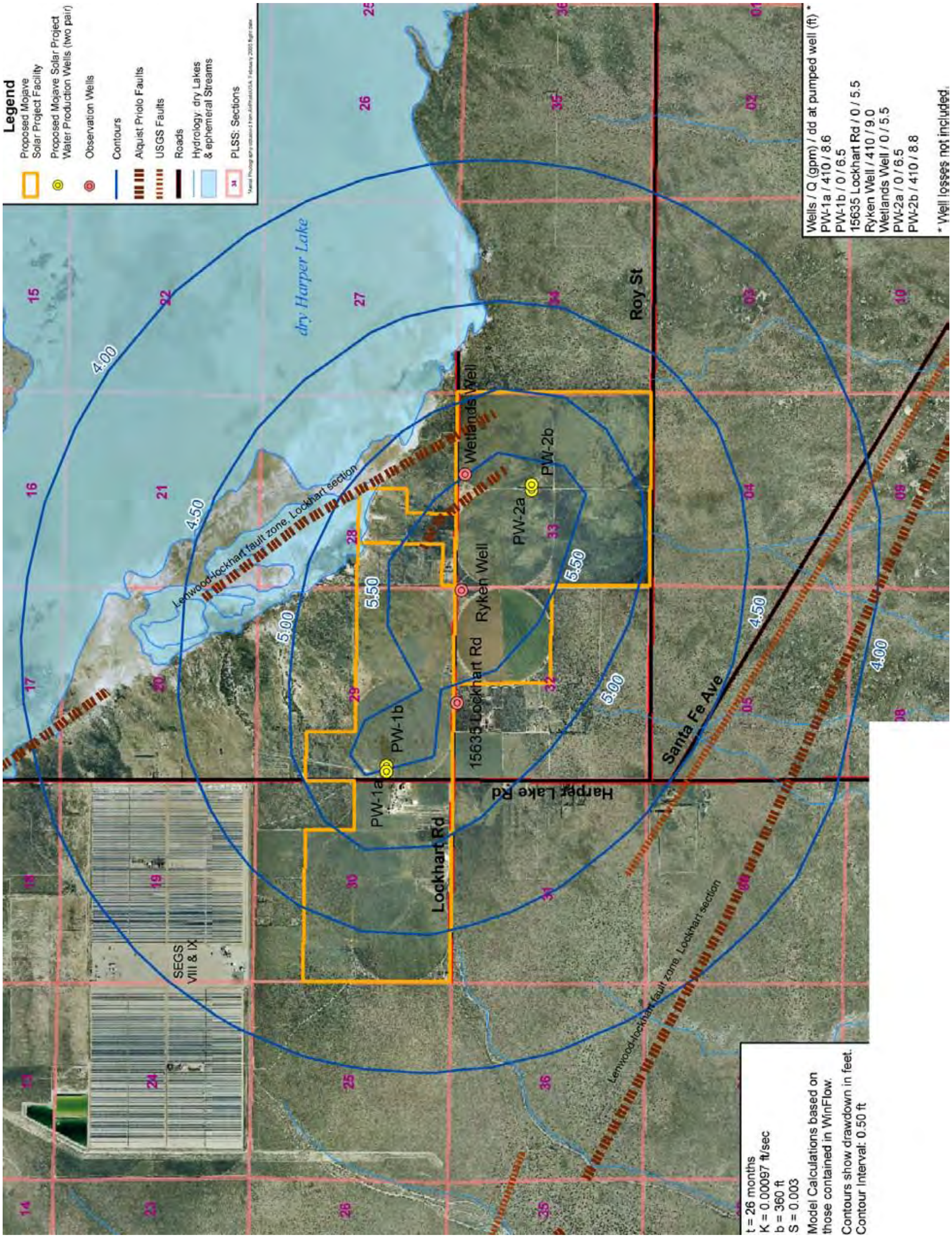

Figure 3.7-8: Predicted Hydraulic Interference – Construction Period

equivalent to 2,160 AFY. Predicted hydraulic interference (drawdown) resulting from 30 years of continuous pumping from two production wells at a rate of 670 gpm at each well is shown in Figure 3.7-9. The maximum estimated hydraulic interference at positions outside the limits of the AMSP site boundary, and at a radial distance of 0.5 mile from production wells PW-1a and PW-2b, is 5.2 feet. Therefore, the projected interference to offsite wells located as close as 0.5 mile from the AMSP supply wells would be minor. Based on interpretations of 2D modeling simulations, the uQal aquifer shows minimal sensitivity (with regard to hydraulic head) to relatively small change in the discharge rate of (±20 AFY).

Maximum estimated onsite drawdown during AMSP operations is 11.3 feet as shown in Figure 3.7-9. Pumping levels (or maximum onsite drawdown) tend to be underestimated by WinFlow simulations since well losses are not considered in the model. Therefore, the model predictions of maximum onsite drawdown have been doubled to account for well losses.

Based on the estimated solar energy and plant operating profile, a maximum of approximately 2,160 AFY of water would be used by the AMSP (which includes 10 AFY needed for water treated to potable standards as noted previously), with expected use of 1,700 AFY. Based on the CEC Conditions of Certification, groundwater use for the AMSP for all construction and operations activities shall not exceed 2,160 acre-feet per year. Monthly water usage is projected to follow the monthly schedule shown in Table 3.7-1.

Table 3.7-1: Estimated Monthly Water Usage

Month	Approximate Water Usage Acre-Feet (gpm)[1,2]	Month	Approximate Water Usage Acre-Feet (gpm)[1,2]
January	55.27 (404)	July	291.66 (2,129)
February	78.35 (633)	August	272.81 (1,992)
March	150.99 (1,102)	September	240.65 (1,815)
April	230.28 (1,737)	October	135.35 (988)
May	278.72 (2,035)	November	80.10 (604)
June	289.16 (2,181)	December	59.66 (436)

[1] The estimated groundwater usage in gallons per minute (gpm) is based on average daily consumption.
[2] The maximum groundwater production rate for which the wells would be designed to pump is approximately 1,099 gpm (or 2,198 gpm for two production wells).
Source: CEC AFC 2009, Water Resources Table 5.17-9.

As indicated in Table 3.7-1, estimates of water usage during the months of April through September range from between 1,737 and 2,181 gpm. During the winter months of October through March, the flow rate would be substantially reduced, to between 404 gpm (January) and 988 gpm (October). The maximum groundwater production rate for each well is projected to be approximately 1,099 gpm (or 2,198 gpm for two production wells). The average flow rate normalized for the entire year would be about 670 gpm for each well (or 1,340 gpm from two production wells). These flow rate estimates are conservative since they do not take into account AMSP water storage capacity.

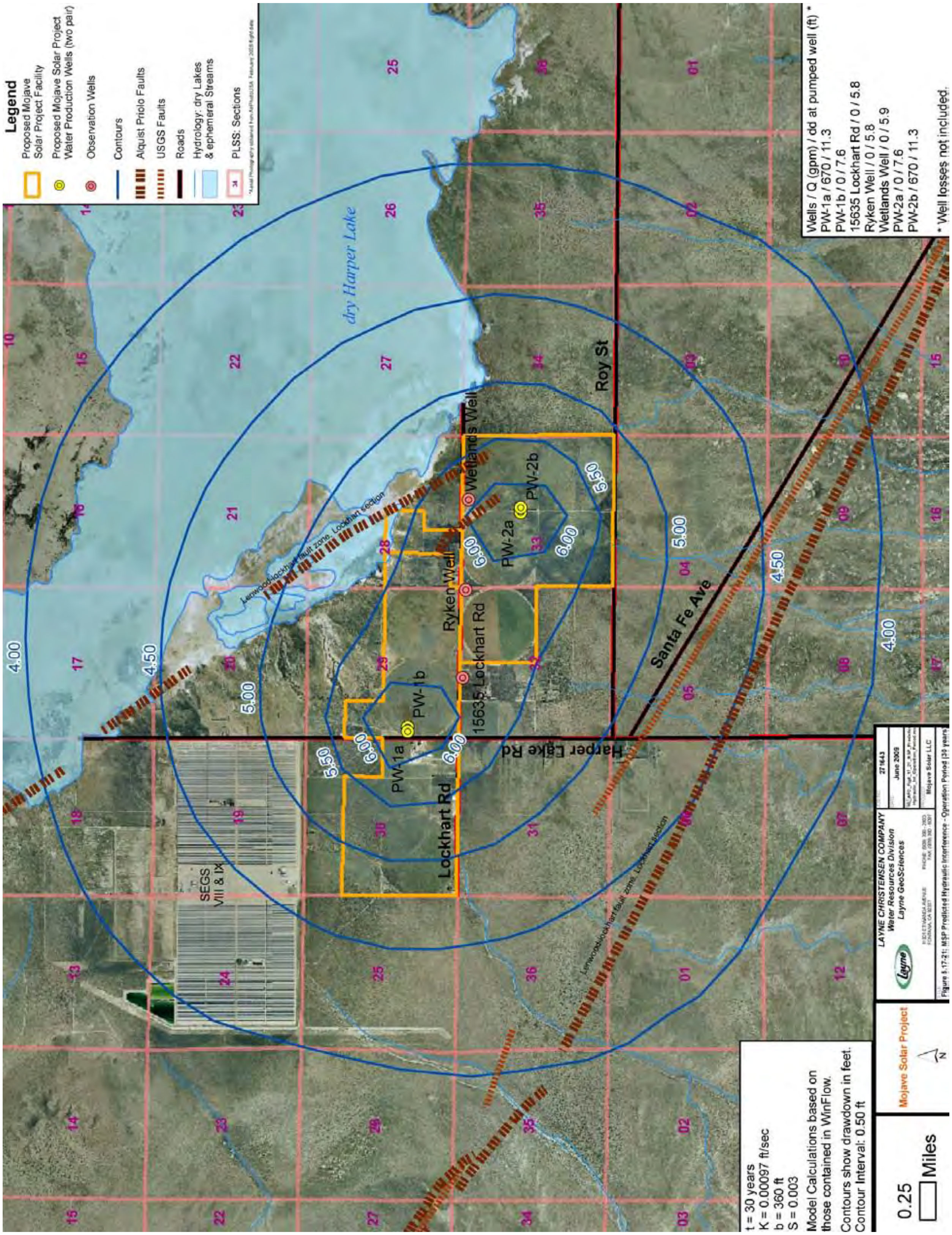

Figure 3.7-9: Predicted Hydraulic Interference – Operational Period

Because of the high transmissivity of the uQal aquifer, prolonged extraction for AMSP supply water is not anticipated to cause an increase in TDS concentration and deterioration in quality by drawing in water of higher salinity from an expanded pumping depression reaching below Harper Dry Lake. Similarly, the proposed pumping of groundwater to supply the AMSP during operation is not expected to induce additional migration of Mojave River underflow. Historically, approximately 6,500 to 18,000 AFY of groundwater was used for agriculture production in the vicinity of the existing SEGS VIII and X and the proposed AMSP site, as compared to the estimated 1,700 AFY needed during operation of the AMSP. Groundwater production during AMSP operation is not expected to adversely impact groundwater quality.

A groundwater well monitoring network would be established, and groundwater levels and groundwater quality would be monitored in the network for the life of the AMSP. Any impacts to groundwater levels or quality, while not expected, would be mitigated.

The Mojave Water Agency would be responsible for the approval of the requested transfer of water rights for the use of Harper Valley Groundwater Basin groundwater for the construction and operational phases of the project. The AMSP would comply with the Lahontan RWQCB Waste Discharge Requirements for the construction and operation of the surface impoundments (evaporation ponds), bioremediation unit, land treatment unit, and storm water management system. In addition, the AMSP would be subject to the SWPPP, construction storm water permit, and industrial stormwater permit issued by the Lahontan RWQCB. An application for a septic system permit for the proposed sanitary waste septic system and leach field would be submitted to the County of San Bernardino.

The AMSP is subject to the requirements of Title 22, Article 3, Sections 64400.80 through 64445 for operation of a nontransient, noncommunity water system (serving 25 people or more for more than 6 months). In addition, the system will would require periodic monitoring for various bacteriological, inorganic and organic constituents. Required information to operate such a system would be submitted to the County of San Bernardino at least 60 days prior to commencement of operations at the site.

As a conservation method, Mojave Solar shall annually sequester a volume of Free Production Allowance equal to the annual volume of groundwater pumped for the AMSP. A Free Production Allowance is the amount of water a producer can pump in a specific subarea in one year without incurring a Replacement Obligation (Mojave Water Agency 2008).

Telecommunication System

No groundwater sources would be impacted from installation of fiber-optic cables. No discharge is proposed and no water use is proposed for these elements.

3.7.3.2 No-Action Alternative

Under the No-Action Alternative, DOE would not issue Mojave Solar a loan guarantee for construction of the AMSP, and Mojave Solar would not proceed with the proposed Project. Absent the proposed Project, the AMSP/Lockhart Substation site would continue in its current use and there would be no changes to current water resource conditions. Assuming current use continued on the property, there would be no impacts to water resources under the No-Action Alternative.

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3.8 Biological Resources

This section includes a description of the biological resources within and surrounding the proposed Project study area; the laws, ordinances, and regulations related to biological resources that may be affected by implementation of the proposed Project; and potential impacts to biological resources (vegetation communities, wildlife, and special-status species) during construction and operation of the proposed Project. The biological resources analysis for the AMSP/Lockhart Substation and interconnection site is based on the information in the 2009 study Biological Technical Report (EDAW 2009) conducted to support the CEC AFC. The proposed fiber-optic telecommunication system study area is also included in the following analysis as part of the proposed Project.

3.8.1 Regulatory Framework

The primary federal and State of California regulatory agencies with oversight of proposed Project resources include the U.S. Fish and Wildlife Service (USFWS), CDFG, and CEC. The applicable federal, state and local laws, ordinances, and regulations are summarized below.

Federal

<u>Endangered Species Act</u>

This 1973 law, administered by USFWS and the National Marine Fisheries Service, is designed to minimize impacts to imperiled plants and animals, as well as facilitate recovery of such species. Plant and animal species are listed as “endangered” or “threatened” based on a variety of factors. “Take” of a listed species is prohibited except as authorized through consultation with USFWS or the National Marine Fisheries Service and issuance of incidental take authorization under Section 7 or Section 10 of the federal Endangered Species Act (ESA), depending on whether a federal agency action is required for the proposed Project (e.g., a federal permit required or federal funding involved). Take is defined under the ESA as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct.”

Section 10 permitting requires preparation of a habitat conservation plan (HCP) to ensure the continued viability of listed species and their habitats, issuance of an Incidental Take Permit (ITP), and preparation of an Implementing Agreement. USFWS also must comply with NEPA in issuing a Section 10 permit and HCP. If there is a limited potential for impacts to federally listed species, a “low effect” HCP can be prepared, an action that is categorically excluded from NEPA. In the event that federal agency action is required for the proposed Project that triggers consultation with USFWS under Section 7, a take authorization may be obtained as part of the Biological Opinion issued at the conclusion of the ESA Section 7 consultation. DOE, as the lead federal agency for the Proposed Action, is consulting with USFWS under Section 7. BLM is a cooperating agency in the consultation.

Migratory Bird Treaty Act

This law prohibits actions resulting in the pursuit, capture, killing, and/or possession of any protected migratory bird, nest, egg, or parts thereof. USFWS maintains a list of designated migratory birds occurring in various regions of the United States.

Bald and Golden Eagle Protection Act

This act specifically protects bald and golden eagles and prohibits "take" of individual birds and their parts (feathers, skins, etc.), eggs, or nests.

State

California Public Resources Code § 25500 et seq., Warren-Alquist Act

The Abengoa Mojave Solar Project (AMSP), which includes the Lockhart Substation and on-site transmission line components, is subject to CEC licensing jurisdiction pursuant to California Public Resources Act § 25500 et seq. (Warren-Alquist Act). During licensing proceedings, CEC acts as lead state agency under CEQA and all state and local authorizations required for the AMSP are included in the CEC License Decision. Public Resources Code Sections 25519(a), 21000 et seq. CEC's regulatory process, including the evidentiary record and associated analyses, is functionally equivalent to the preparation of an environmental impact report (EIR) Public Resources Code § 21080.5. CEC completed its CEQA-equivalent review of the AMSP, which included the Lockhart Substation and transmission components located on the site, and issued a License Decision for the AMSP in September 2010.

California Public Utilities Code

The proposed fiber-optic line upgrades, Lockhart Substation, and interconnect between the substation and SCE's 220-kV transmission grid will require a Permit to Construct, issued by CPUC pursuant to the California Public Utilities Code. Compliance with CEQA and all other applicable state and local laws for the Lockhart Substation and transmission tie-in located on the AMSP site is included in the CEC License Decision issued for the AMSP in September 2010. CPUC actions with respect to the fiber-optic line upgrades will include CEQA compliance and compliance with all other applicable state and local laws.

California Endangered Species Act

The California Endangered Species Act (CESA) prohibits the "take" (defined as "to hunt, pursue, catch, capture, or kill") of state-listed species except as otherwise provided in state law. CESA, administered by CDFG, is similar to the federal ESA, although unlike the federal law, CESA applies incidental take prohibitions to species currently petitioned for state listing status (i.e., candidate species). State lead agencies are required to consult with CDFG to ensure that their authorized actions are not likely to jeopardize the continued existence of any state-listed species or result in the degradation of occupied habitat.

Under Section 2081, CDFG authorizes "take" of state-listed endangered, threatened, or candidate species through the issuance of an ITP or memoranda of understanding if (1) the take is incidental to otherwise lawful activities, (2) impacts of the take are minimized and fully mitigated, (3) the permit is consistent with regulations adopted in accordance with any recovery plan for the species in questions, and (4) the applicant ensures suitable funding to implement the measures required by CDFG. Under the Warren-Alquist Act, PRC §25500, CEC is responsible for issuing all authorizations required under state law for the AMSP/Lockhart Substation, and CESA incidental take authorization for the AMSP/Lockhart Substation is included in the CEC License Decision. A separate CESA Section 2081 incidental take authorization application will be processed by CDFG for SCE's fiber-optic communication system.

California Desert Native Plants Act (Fish and Game Code §1925 et seq.)

This act protects California desert native plants on both public and privately owned land. Both CDFG and the Department of Food and Agriculture assist with enforcement of this act. The California Desert Native Plants Act prohibits the harvest, transport, sale, or possession of specific native desert plants (in certain counties) unless a permit is secured from the Agricultural Commissioner in the county for which the action is to take place.

Native Plant Protection Act (Fish and Game Code §1900 et seq.)

The Native Plant Protection Act includes measures to preserve, protect, and enhance rare and endangered native plant species. Definitions for "rare and endangered" are different from those contained in CESA, although CESA-listed species are included in the list of species protected under the Native Plant Protection Act.

Local

San Bernardino County General Plan, Land Use/Conservation/Open Space Element (2004)

This planning document implements programs that maintain and enhance biological diversity and healthy ecosystems throughout San Bernardino County by ensuring that proposed development projects demonstrate a high degree of compatibility with sensitive biological resources and that coordination with state and federal agencies is exercised so that protection of biological resources parallels the goals of those agencies. This would be applicable to those portions of the SCE fiber-optic upgrades located in San Bernardino County.

Plant Protection and Management (San Bernardino County Development Code, §89.0101 et seq.)

This county ordinance promotes the continued health of plant resources by providing regulations and guidelines that assist with the management of plant resources in the unincorporated areas of San Bernardino County on property or combinations of property under private or public ownership. This ordinance may require preparation of a plot plan that describes removal of native plants in portions of the proposed Project study area with native vegetation growth. This plot plan would be submitted as part of the native tree/plant removal permit in conjunction with a development permit and/or approval of a land use application. This would be applicable to those portions of the SCE fiber-optic upgrades located in San Bernardino County.

3.8.2 Study Methodology

Prior to beginning field surveys, proposed Project biologists consulted the CDFG California Natural Diversity Database (CNDDB) (RareFind Version 3.1.0; CDFG 2008) and the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (CNPS 2010) to determine historic occurrence of special-status plant and wildlife species and other natural resources within the vicinity of the AMSP site and fiber-optic alignments.

AMSP and Lockhart Substation

As noted in the 2009 Biological Technical Report, several studies were undertaken at the AMSP site since 2006. For each biological resource study, the area surveyed included the AMSP/Lockhart Substation site plus a 1-mile biology buffer around the site (“study area”). Because the AMSP/Lockhart Substation design has changed since 2006, each study may have slight boundary variations (see Figures 3.8-5 through 3.8-8). Reconnaissance surveys were conducted in 2006, during which biologists conducted basic vegetation mapping and general habitat suitability analyses for special-status species potentially occurring within the region. This was followed by protocol-level biological surveys for plants and animals in the spring of 2007 and 2008. Survey protocols included the 1992 USFWS desert tortoise survey methodology, and the 1993 California Burrowing Owl Consortium guidelines for western burrowing owl surveys (as adopted by CDFG in 1995). Supplemental surveys were also conducted in spring 2009. Surveys to map vegetation communities and determine presence or absence of special-status plant and wildlife species were conducted within the AMSP/Lockhart Substation study area in accordance with established survey protocols.

Botanical surveys were performed during spring and summer in 2007, 2008, and 2009 by qualified biologists using survey methodology described by CNPS and CDFG.

General wildlife surveys were conducted concurrently with protocol wildlife surveys and vegetation mapping during May and June 2007, 2008, and 2009. USFWS protocol surveys were conducted for Mojave desert tortoise (*Gopherus agassizii*; DT) during 2007, 2008, and 2009.

California Burrowing Owl Consortium protocol surveys were conducted for western burrowing owl (*Athene cunicularia*; WBO) in 2007 and 2008. Surveys, following CDFG guidelines for Mohave ground squirrel (*Spermophilus mohavensis*; MGS), were performed during 2007, and a habitat assessment was performed in 2008. Additionally, surveys were conducted in 2010 for nesting golden eagle (*Aquila chrysaetos*) and Swainson's hawk (*Buteo swainsoni*; SWHA) following USFWS and CDFG guidelines.

Fiber-optic Telecommunication System

A reconnaissance-level survey of the proposed fiber-optic telecommunication system corridors was conducted in April 2010, covering all three of the proposed routes. As part of the reconnaissance–level survey, a biologist conducted general habitat assessments to prepare basic vegetation mapping and general habitat suitability analyses for special-status species potentially occurring within the region. The area surveyed covered approximately 100 feet on each side of the existing transmission line alignments ("study area"), which are the proposed locations for the fiber-optic cables. See Figures 3.8-2, 3.8-3, and 3.8-4. This reconnaissance-level survey was conducted to collect general data on changes in dominant species composition, observations of habitat quality, and notes on development of the landscape. In addition, a data base search was also conducted, including CNDDB and National Wetlands Inventory.

Portions of the three routes that cross Desert Wildlife Management Areas (DWMAs) and MGS conservation areas are assumed occupied by DT and MGS. See Figures 3.8-2, 3.8-3, and 3.8-4.

3.8.3 Affected Environment

Several biological resource management areas exist near and overlap with the AMSP /Lockhart Substation study area and telecommunication routes, including USFWS-designated DT critical habitat to the north, west, and south of the AMSP /Lockhart Substation site and the Superior-Cronese and Fremont-Kramer DWMAs, both of which were established to protect DT and their habitat as part of the 1994 DT Recovery Plan (USFWS 2008) (Figure 3.8-1). DT critical habitat includes specific areas that are essential for the conservation of DT and have biological factors necessary for the survival of the species. The AMSP has been designed to avoid DT critical habitat (the nearest border is 0.7 mile to the southwest of the AMSP site) and both DWMAs, which are located along the southern border of the AMSP site. The telecommunication routes are partially located within both DWMAs and within DT critical habitat, but impacts to those areas will be avoided, minimized, and mitigated as described in Section 3.8.4.1.2. (Refer to Figures 3.8-2, 3.8-3, and 3.8-4.)

In addition to DT critical habitat and the Superior-Cronese DWMA, an approximately 480-acre area exists in the southwestern portion of Harper Dry Lake that is designated as an ACEC by BLM's California Desert Conservation Area Plan, as amended (BLM 1980). The ACEC was established to protect and prevent irreparable damage to the remnant marsh at the southwestern edge of Harper Dry Lake. This marsh has been known to support migratory birds

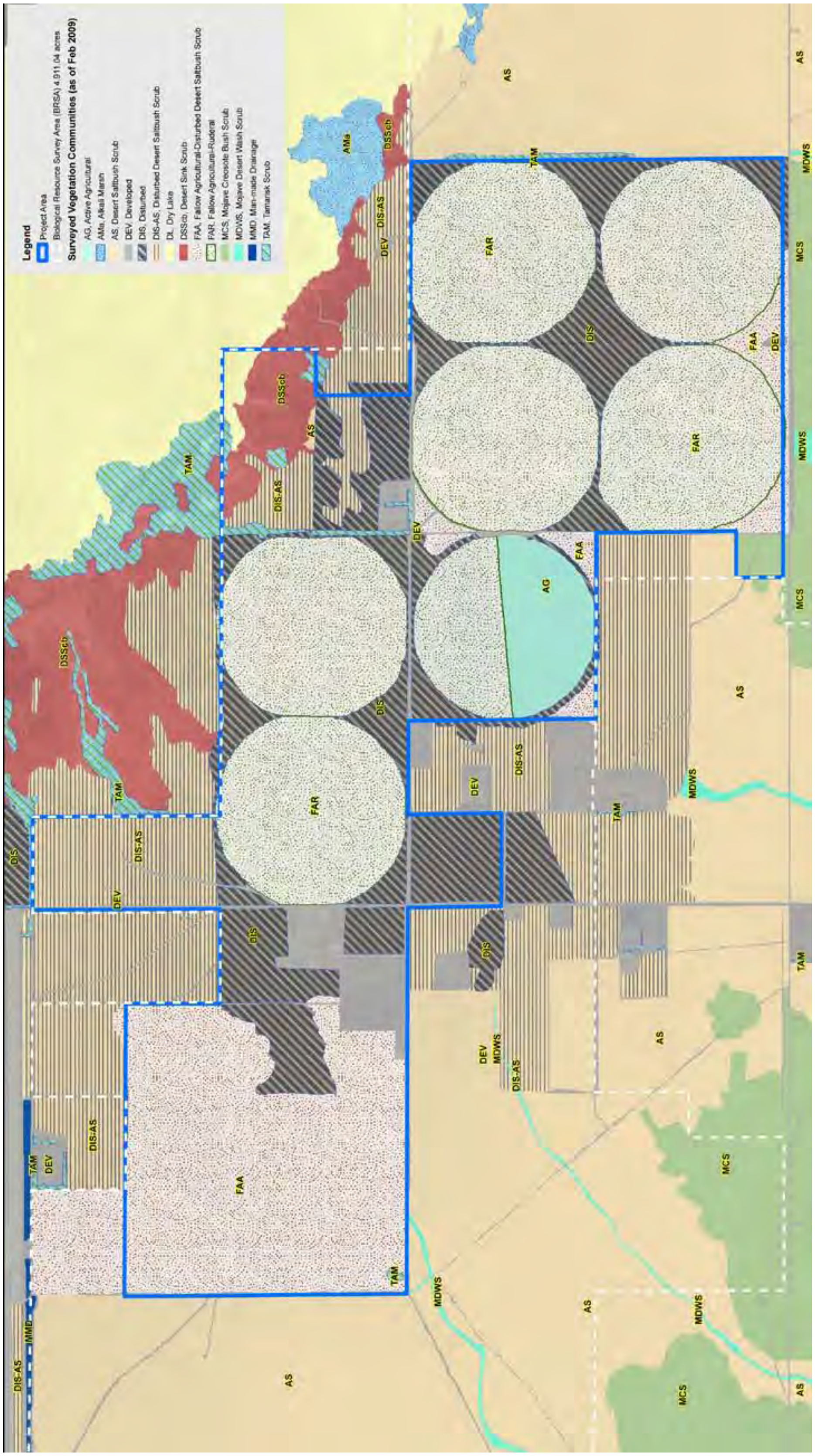

Figure 3.8-1: Existing Vegetation – AMSP/Lockhart Substation Site

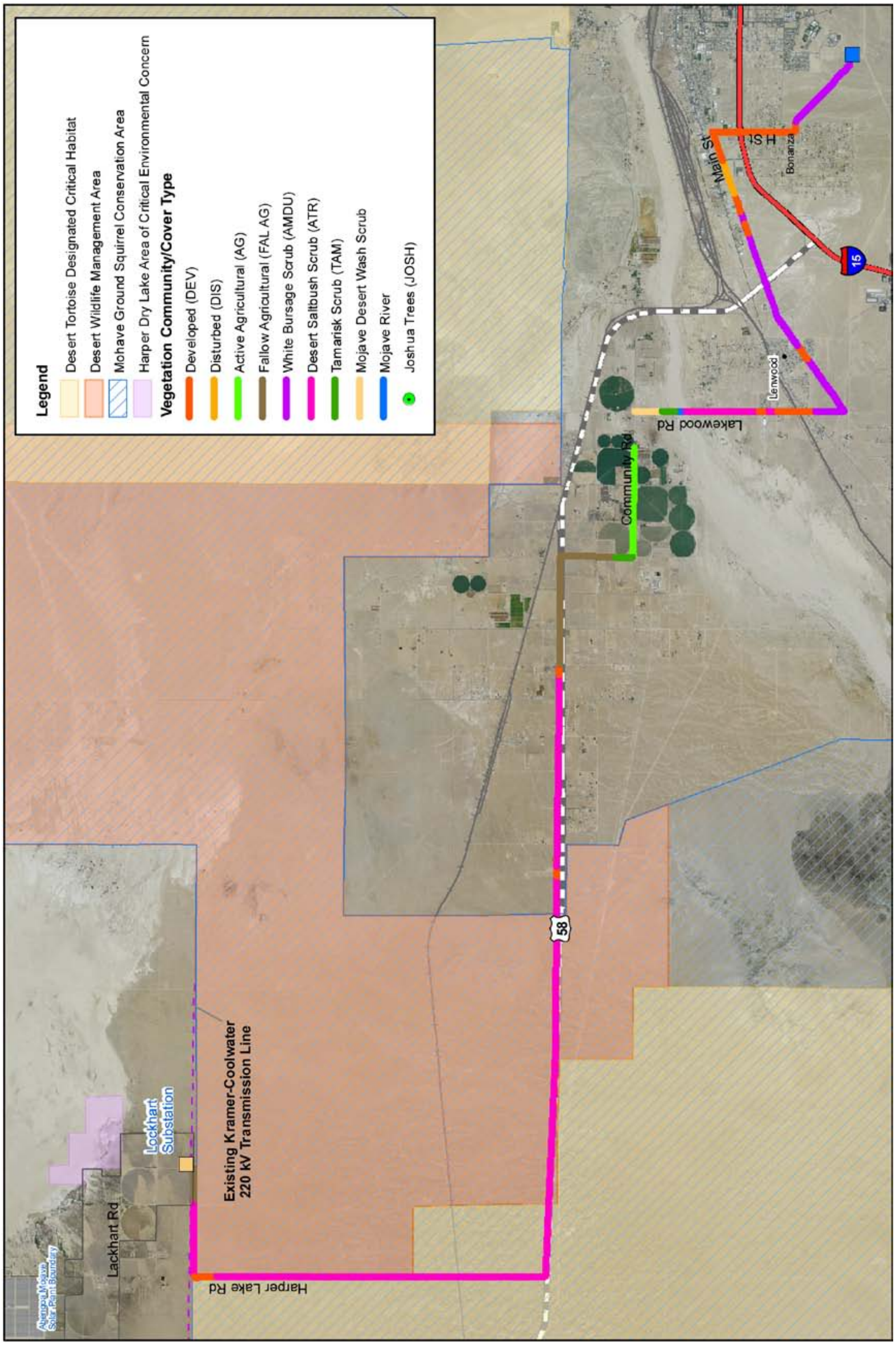

Figure 3.8-2: Existing Vegetation – Lockhart to Tortilla

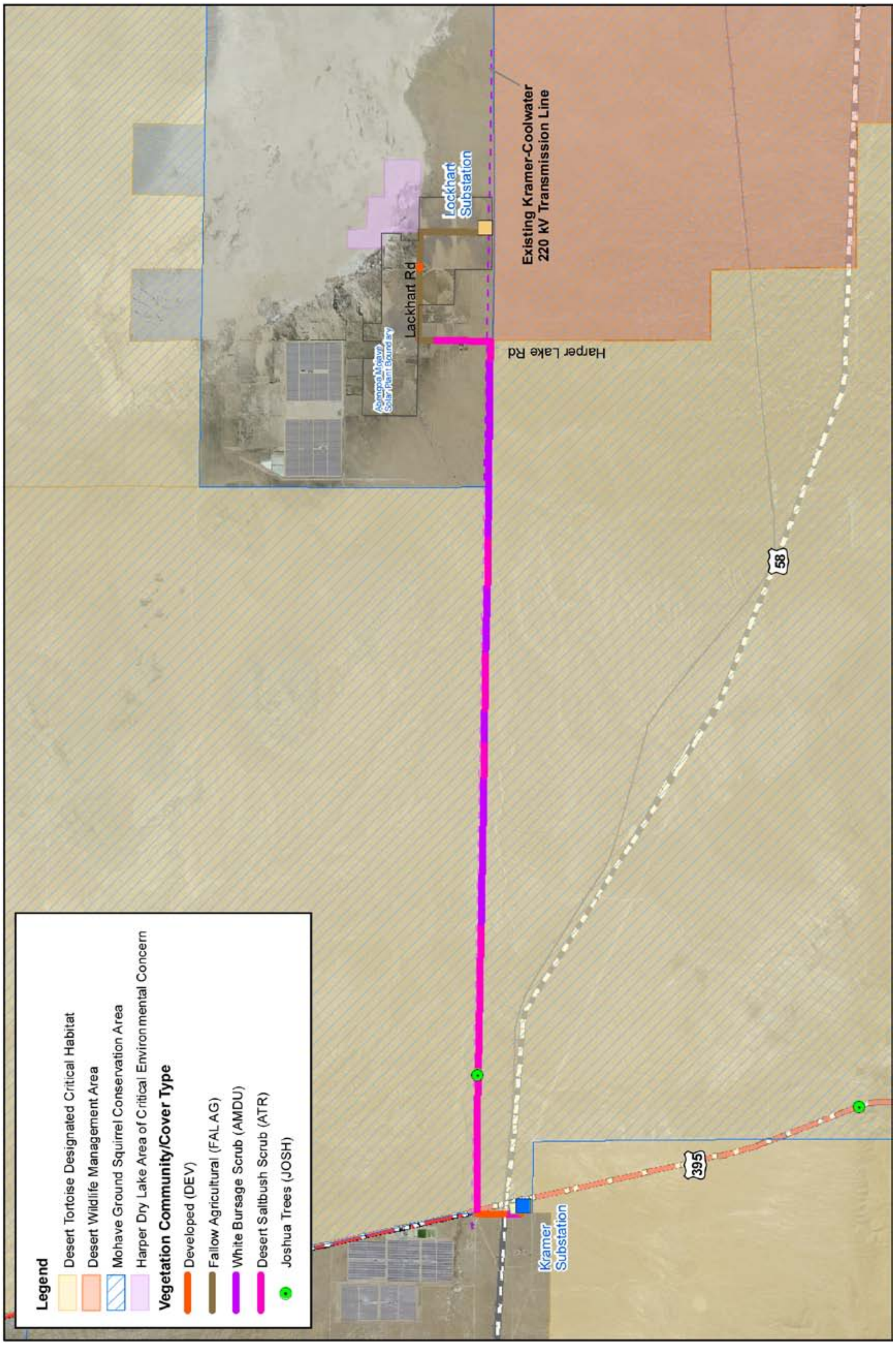

Figure 3.8-3: Existing Vegetation – Lockhart to Kramer

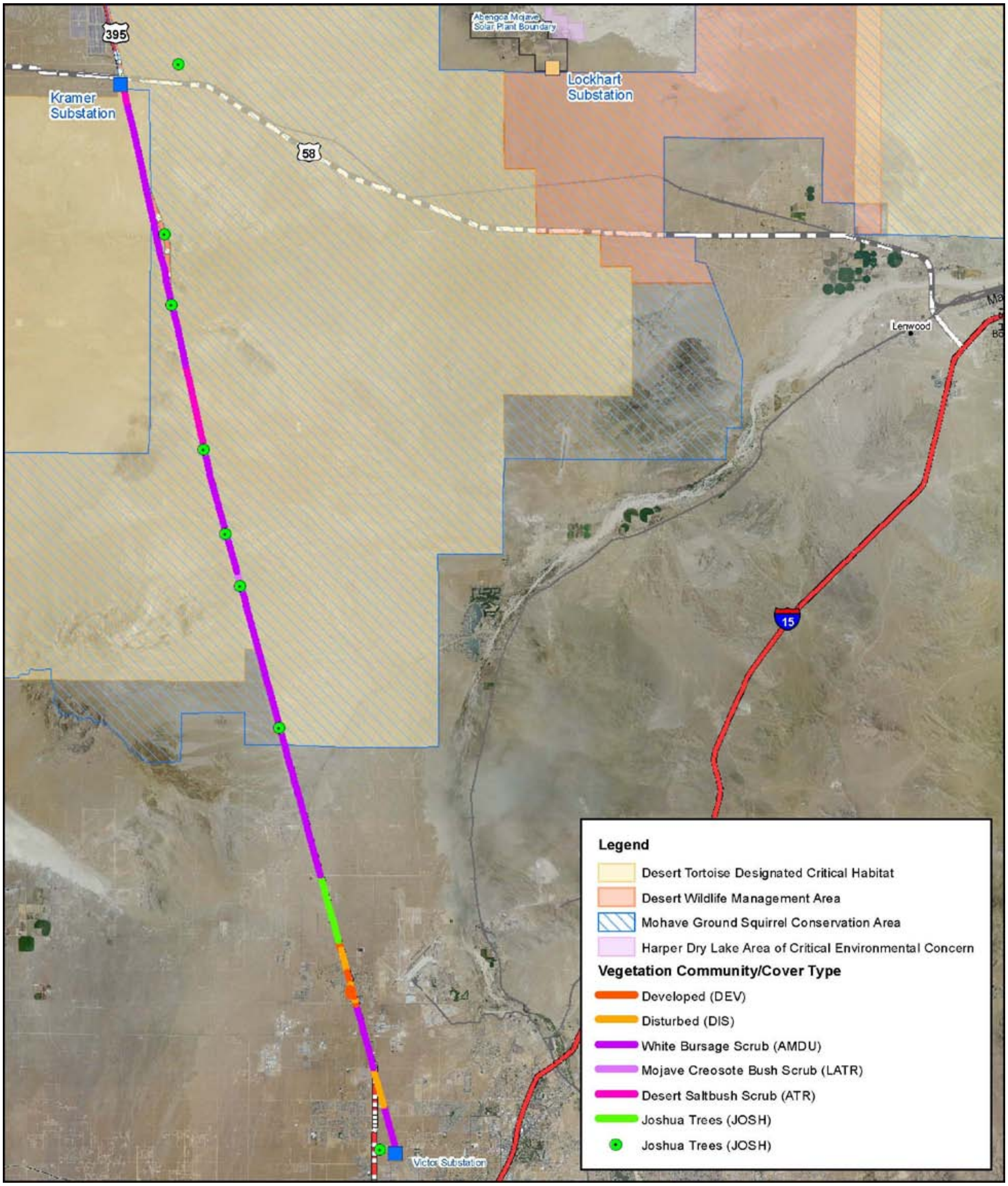

Figure 3.8-4: Existing Vegetation – Kramer to Victor

during periods of inundation, including western snowy plover (nonlisted population) (*Charadrius alexandrinus nivosus*; USFWS 2009). The current design for the AMSP/Lockhart Substation site includes a storm water drainage outlet that would convey any runoff generated during storms from the southwest through the site to the Harper Dry Lake margin, where the ACEC is located; however, no impacts to the ACEC would occur during construction or operation of the AMSP and Lockhart Substation. Lastly, BLM designated an MGS Conservation Area, which lies south and east of the AMSP/Lockhart Substation site. The MGS Conservation Area was established to provide long-term protection of MGS habitat throughout its range and no AMSP/Lockhart Substation impacts will occur to that area. The telecommunication routes are partially located within MGS conservation areas, but impacts to those areas will be avoided, minimized and mitigated as described in Section 3.8.4.1.2. (Figures 3.8-2, 3.8-3, and 3.8-4).

3.8.3.1 Vegetation and Invasive/Exotic Species

3.8.3.1.1 AMSP and Lockhart Substation

The majority of the proposed AMSP/Lockhart Substation site has low vegetative cover, primarily composed of fallow agricultural-ruderal areas and some patches of desert scrub dominated by *Atriplex* species (saltbush) (Figure 3.8-1). Saltbush shrub growth within these areas is mostly the result of recolonization into land left barren and disturbed following decades of agricultural practices. General botanical surveys resulted in the cover types summarized in Table 3.8-1. Acreage totals were rounded to the nearest tenth of an acre. Refer to Appendix M for detailed descriptions of these vegetation types.

Several invasive weeds occur in the vicinity of the proposed AMSP/Lockhart Substation site, largely the result of anthropogenic development. The following invasive plant species (in order of abundance) are present in the AMSP/Lockhart Substation site and are listed as having “severe” to “moderate” invasiveness by the California Invasive Plant Council: Russian thistle (*Salsola tragus*), herb Sophia (*Descurania sophia*), Saharan mustard (*Brassica tournefortii*), London rocket (*Sisymbrium irio*), tamarisk (*Tamarix ramosissima*), slender wild-oat (*Avena barbata*), red brome (*Bromus madritensis* ssp. *rubens*), cheatgrass (*Bromus tectorum*), and hare barley (*Hordeum murinum*) (California Invasive Plant Council 2006).

3.8.3.1.2 Telecommunication System

Three dominant vegetation communities, as described by Holland (1986), occur along the proposed fiber-optic telecommunication system alignments; in order of abundance, these include white bursage scrub, desert saltbush scrub, and fallow agricultural-ruderal (Table 3.8-1). Unlike the AMSP/Lockhart Substation site, the telecommunication system corridors include white bursage scrub and Joshua tree woodlands, and cross over the Mojave River, a nonvegetated flood channel.

Table 3.8-1: Vegetation Communities and Other Cover Types: Study Area and Distribution

Vegetation Communities and Other Cover Types[1]	AMSP and Lockhart Substation (Acres)	Telecom Lines (Acres)[2]	Total Acreage
Desert Saltbush Scrub	0.74	572.2	572.94
Disturbed – Desert Saltbush Scrub	1.3	0	1.3
Mojave Creosote Bush Scrub	6	57.3	63.3
White Bursage Scrub	0	707.4[3]	707.4
Joshua Tree Woodland	0	1.0	1.0
Desert Sink Scrub	39.6	0	39.6
Tamarisk Scrub	13.2	8.6	21.8
Mojave Desert Wash Scrub	1.9	11.3[4]	13.2
Disturbed Desert Saltbush Scrub Regrowth	223.8	0	223.8
Other Cover Types			
Playa Lakebed	9.44	0	9.44
Nonvegetated channel/floodplain	00	3.1	3.1
Ephemeral Dry Wash	0	17.34	17.34
Fallow Agricultural - Saltbush Scrub Regrowth	202.9	0	202.9
Fallow Agricultural – Ruderal	832.7	104.5	937.2
Active Agricultural	122.6	48.4	171.0
Disturbed	256.1	22.8	278.9
Developed	66.6	60.8	127.4
Total Acreage	1,776.88[5]	1,614.74	3,391.62

1 Based on Holland's *Preliminary Descriptions of the Terrestrial Natural Communities of California* (1986).
2 2010 reconnaissance surveys.
3 The white bursage scrub vegetation community includes the Mojave creosote bush scrub-*Ambrosia dumosa* dominant and Mojave creosote bush –*Ambrosia dumosa* – *Atriplex* scrub described in the preliminary analysis (AECOM 2010).
4 The Mojave desert wash scrub vegetation community includes the Mojave desert wash sandy areas described in the preliminary analysis (AECOM 2010).
5 The total acreage for all vegetation communities and other cover types within the AMSP/Lockhart Substation study area (approximately 1,777 acres) is slightly different than the area calculated during the AMSP land survey performed by engineers (approximately 1,765 acres). The variation in acreage is attributed to a difference in equipment used for determining acreage (i.e., land survey versus GIS processing).

Dominant vegetation communities and cover types within the Lockhart to Tortilla Substation fiber-optic corridor include desert saltbush scrub, white bursage scrub, fallow agriculture-ruderal, and the Mojave River. The distribution of these cover types is depicted in Figure 3.8-2.

Dominant vegetation communities and cover types within the Lockhart to Kramer Substation fiber-optic corridor include desert saltbush scrub, white bursage scrub, Mojave desert creosote bush scrub, and fallow agriculture-ruderal. The distribution of these cover types is depicted in Figure 3.8-3.

Dominant vegetation communities and cover types within the Kramer to Victor Substation fiber-optic corridor include desert saltbush scrub, Mojave desert creosote bush scrub, and developed areas. The distribution of these cover types is depicted in Figure 3.8-4.

Similar to the AMSP/Lockhart Substation site, several invasive weeds occur within the proposed fiber-optic corridors, largely as a result of anthropogenic development. Weeds observed during the 2010 reconnaissance survey were tamarisk, Russian thistle, and Saharan mustard.

3.8.3.2 Wildlife

3.8.3.2.1 AMSP and Lockhart Substation

A total of 103 wildlife species were detected during general reconnaissance and protocol wildlife surveys in support of the 2009 Biological Technical Report (EDAW 2009). These included two butterfly species, 12 reptile species, 73 bird species, and 16 mammal species. Wildlife species that would commonly occur at the AMSP/Lockhart Substation site include the zebra-tailed lizard (*Callisaurus draconoides*), side-blotched lizard (*Uta stansburiana*), turkey vulture (*Cathartes aura*), rock dove (*Columba livia*), red-tailed hawk (*Buteo jamaicensis*), horned lark (*Eremophila alpestris*), common raven (*Corvus corax*), sage sparrow (*Amphispiza belli*), Brewer's blackbird (*Euphagus cyanocephalus*), European starling (*Sturnus vulgaris*), coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonii*), black-tailed jackrabbit (*Lepus californicus*), Merriam's kangaroo rat (*Dipodomys merriami*), and white-tailed antelope squirrel (*Ammospermophilus leucurus*).

Wildlife Habitat Connectivity

Wildlife species depend on mobility across the landscape from place to place for foraging, breeding, and for rearing young (Beier and Loe 1992). No wildlife corridors are documented within or near the AMSP/Lockhart Substation site (EDAW 2009). Most of the area has been previously disturbed through agricultural activities, and biological surveys of the area, conducted annually from 2007 through 2009, indicate that there is only a relatively low level of use by wildlife species. Since the area has been intensively disturbed by historic and ongoing agricultural activities, there are no topographical or habitat features that would facilitate wildlife movement. Additionally, an existing, somewhat degraded series of wire fences currently parallels portions of Harper Lake Road, providing a barrier to wildlife movement.

3.8.3.2.2 Telecommunication Systems

General wildlife species expected to occur in the fiber-optic telecommunication system corridors are likely to be similar to the AMSP/Lockhart Substation study area. A reconnaissance survey has been conducted for the fiber-optic telecommunication system corridors, and it is assumed that DT, MGS, and WBO occupy appropriate habitat located along the proposed telecommunication line routes. Preconstruction surveys will be conducted prior to any ground-disturbing activities and appropriate avoidance and minimization measures will be implemented to protect these species. For purposes of this EA, presence of DT, MGS, and WBO was assumed in appropriate habitat.

Wildlife Habitat Connectivity

As described in Chapter 2, the study area for the proposed fiber-optic lines includes major electric transmission corridors. The existing utility corridors where the fiber-optic cable would be strung include anywhere from one to three existing electric transmission lines. In addition, the proposed telecommunication system corridor parallels portions of SR-58 and U.S. Highway 395. U.S. Highway 395 and SR-58 represent barriers for the movement of wildlife. There are several undercrossings underneath both U.S. Highway 395 and SR-58 that would allow wildlife to move from either side. The installation of the fiber-optic lines on existing transmission lines is not expected to inhibit the movement and does not represent a barrier to wildlife habitat connectivity.

3.8.3.3 Special-Status Species

Special-status species are species that are listed under the ESA as threatened, endangered, or candidate species, or given special designation to denote rarity by the state, such as endangered or threatened species or species of special concern. Special-status plant and wildlife species determined to have potential to occur in the fiber-optic telecommunication system study area are listed in Tables M-1 and M-2 in Appendix M.

3.8.3.3.1 AMSP and Lockhart Substation

Plants

No sensitive plant species were detected within the AMSP/Lockhart Substation site. However, three special-status plant species were detected within the survey buffer during the focused rare plant surveys in 2008: desert cymopterus (*Cymopterus deserticola*; CNPS List 1B.2), Mojave fish-hook cactus (*Sclerocactus polyancistrus*; CNPS List 4.2), and Mojave spineflower (*Chorizanthe spinosa*; CNPS List 4.2). Botanical surveys in 2009 focused on specific portions of the AMSP/Lockhart Substation site (suitable to marginally suitable habitat) to verify the presence or absence of special-status plant species. No special-status plant species were observed during 2009 botanical surveys. Refer to Figure 3.8-5 for sensitive plant mapping at the AMSP/Lockhart Substation site.

One occurrence of desert cymopterus was observed growing in a sandy wash approximately 1,350 feet southeast of the intersection of Santa Fe Avenue and Harper Lake Road. This occurrence is located outside the AMSP/Lockhart Substation site and would not be impacted by project implementation.

One occurrence of Mojave fish-hook cactus was observed growing on a high spot within a wash 975 feet southeast of the desert cymopterus observation. This occurrence is located outside of the AMSP/Lockhart Substation footprint and would not be impacted by project implementation.

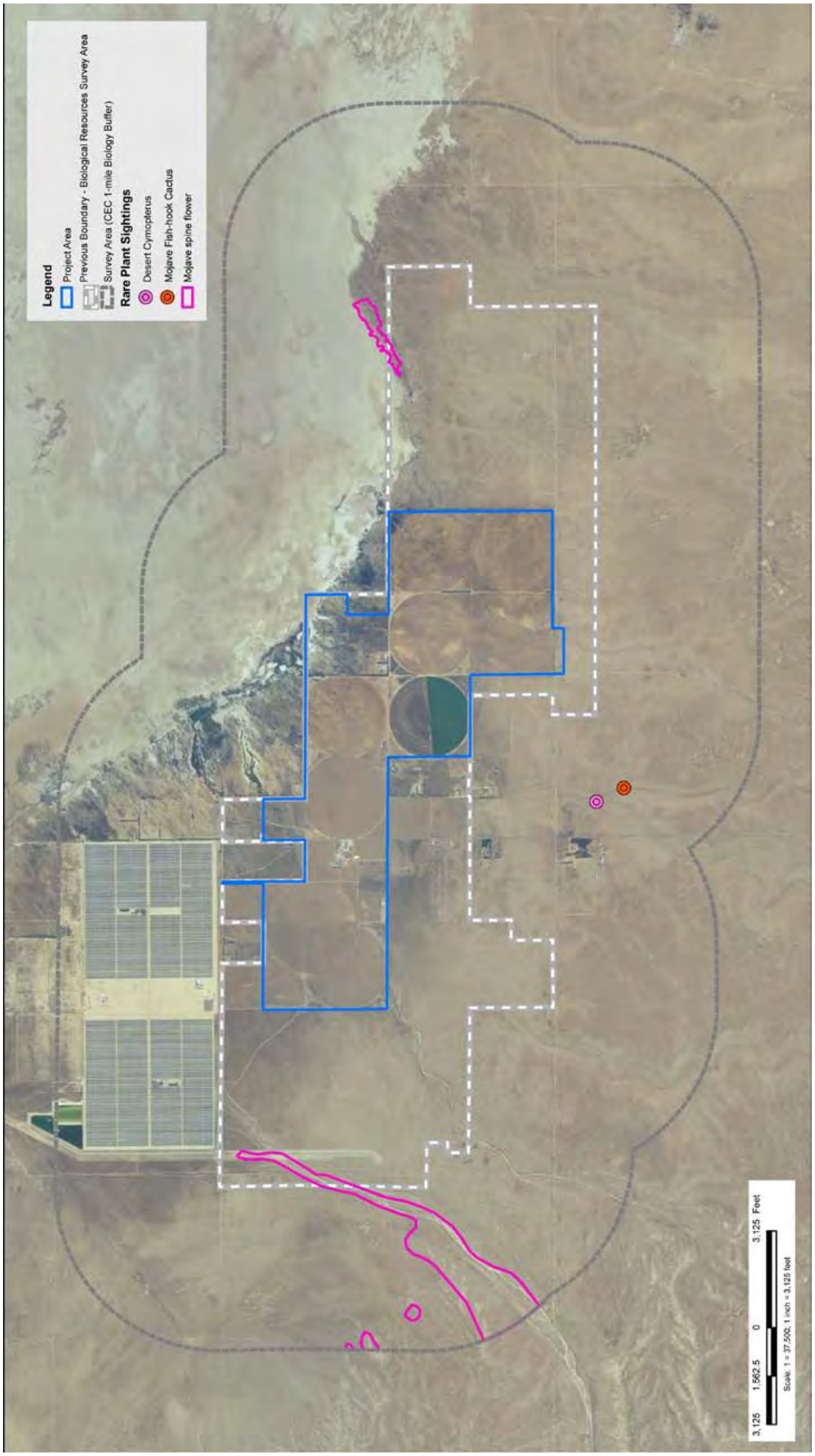

Figure 3.8-5: Sensitive Plant Species – AMSP/Lockhart Substation Study Area

Two occurrences of Mojave spineflower were observed during surveys. One population was located to the west of the AMSP/Lockhart Substation site growing in a wash. The other population was located to the east of the site at the edge of Harper Dry Lake. These occurrences are located outside the AMSP/Lockhart Substation footprint and would not be impacted by project implementation.

Wildlife

Federally Listed and/or State-Listed Species

Five federally listed and/or state-listed wildlife species were detected within the AMSP/Lockhart Substation site. These include the federally listed and state-listed DT, as well as the state-listed SWHA, American peregrine falcon (*Falco peregrinus anatum*), willow flycatcher (*Empidonax traillii*), and MGS (EREMICO 2007). Refer to Appendix M for a detailed description of survey results. Refer to Figures 3.8-6 through 3.8-10 for sensitive wildlife species mapped in the AMSP/Lockhart Substation study area.

Mojave Desert Tortoise

DT focused surveys were conducted in spring (between April and May) in 2007 through 2009 according to the USFWS DT survey protocol (USFWS 1992), which requires surveys of all areas determined to have appropriate habitat for DT using belt transects 30 feet wide to afford 100% visual coverage. In addition, the Zone of Influence (ZOI), which is defined as the area where DT on adjacent lands may be directly or indirectly affected by the AMSP/Lockhart Substation development, also was surveyed. At a minimum, a single, 30-foot-wide ZOI transect was surveyed at 100-, 300-, 600-, 1,200-, and 2,400-foot intervals from and parallel to the edge of the AMSP/Lockhart Substation boundary. All DT sign (shells, bones, scutes, limbs, scat, burrows, pallets, tracks, egg shell fragments, courtship rings, drinking sites, mineral licks, etc.) within the AMSP/Lockhart Substation boundary and on ZOI transects were mapped. In addition to the five ZOI transects required by the USFWS protocol, the CEC Biology Siting Regulations (CEC 2007) recommend surveying two additional transects at 3,960-foot and 5,280-foot intervals from and parallel to the edge of the AMSP/Lockhart Substation boundary, which was done.

The survey was conducted by slowly and systematically walking linear transects while surveyors visually searched for DT and sign. All DT sign detected within the survey area and ZOI was mapped using GPS units and associated data was recorded onto field data sheets. Particular emphasis was placed on searching around the bases of shrubs and along the banks of shallow washes. The Harper Dry Lake bed was not considered suitable DT habitat and therefore was not surveyed. However, other botanical and wildlife surveys were conducted in this area per CEC guidelines and all DT sign detected during these surveys was recorded. Live DT observed were measured at middle carapace length (or MCL) and evaluated for health. Carcasses were aged, measured (if possible), and classed using Dr. Alice Karl's *Key to Sign Classes* classification system. Height and width of DT burrow openings and length/depth of burrows were recorded.

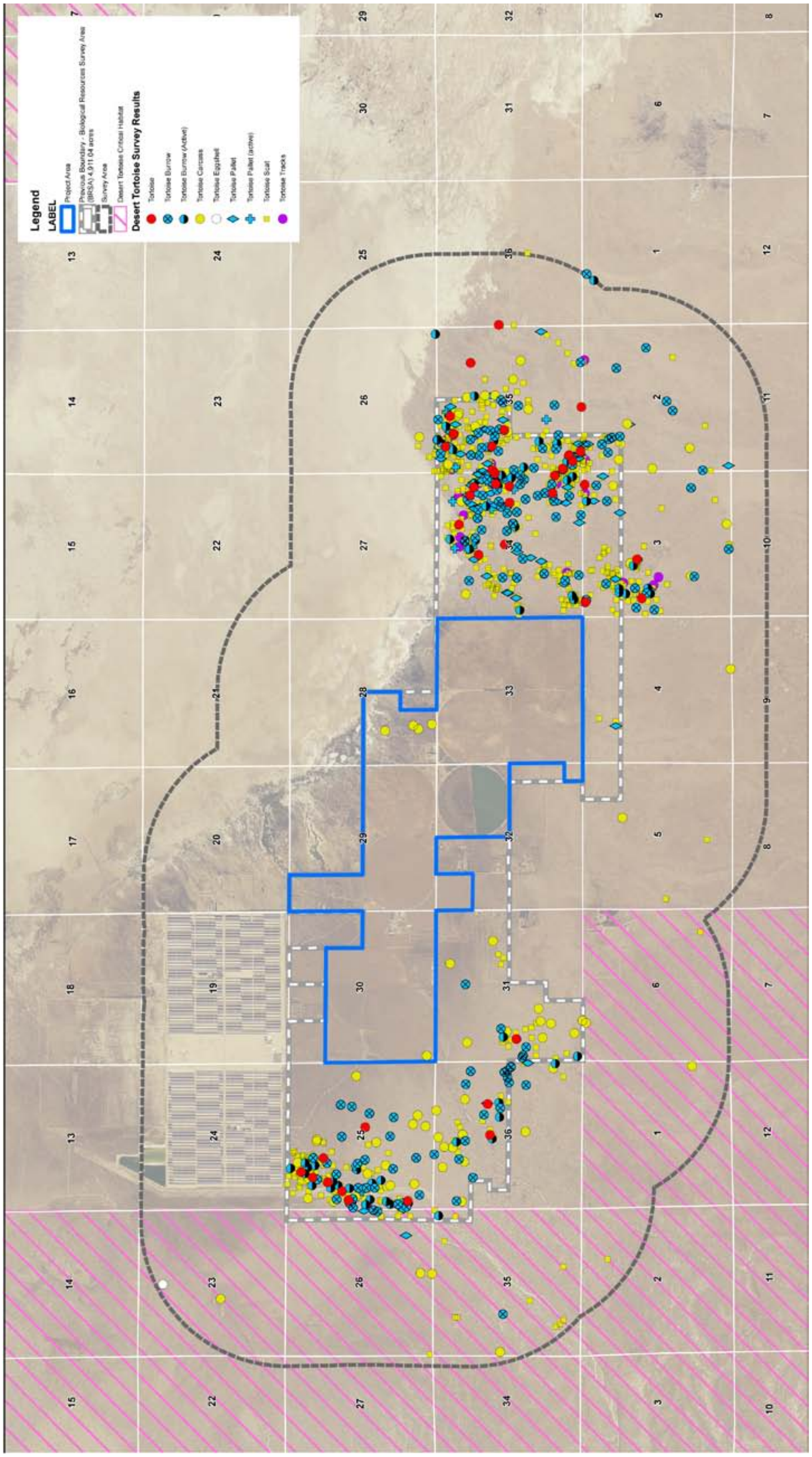

Figure 3.8-6: Desert Tortoise Sign – AMSP/Lockhart Substation Study Area

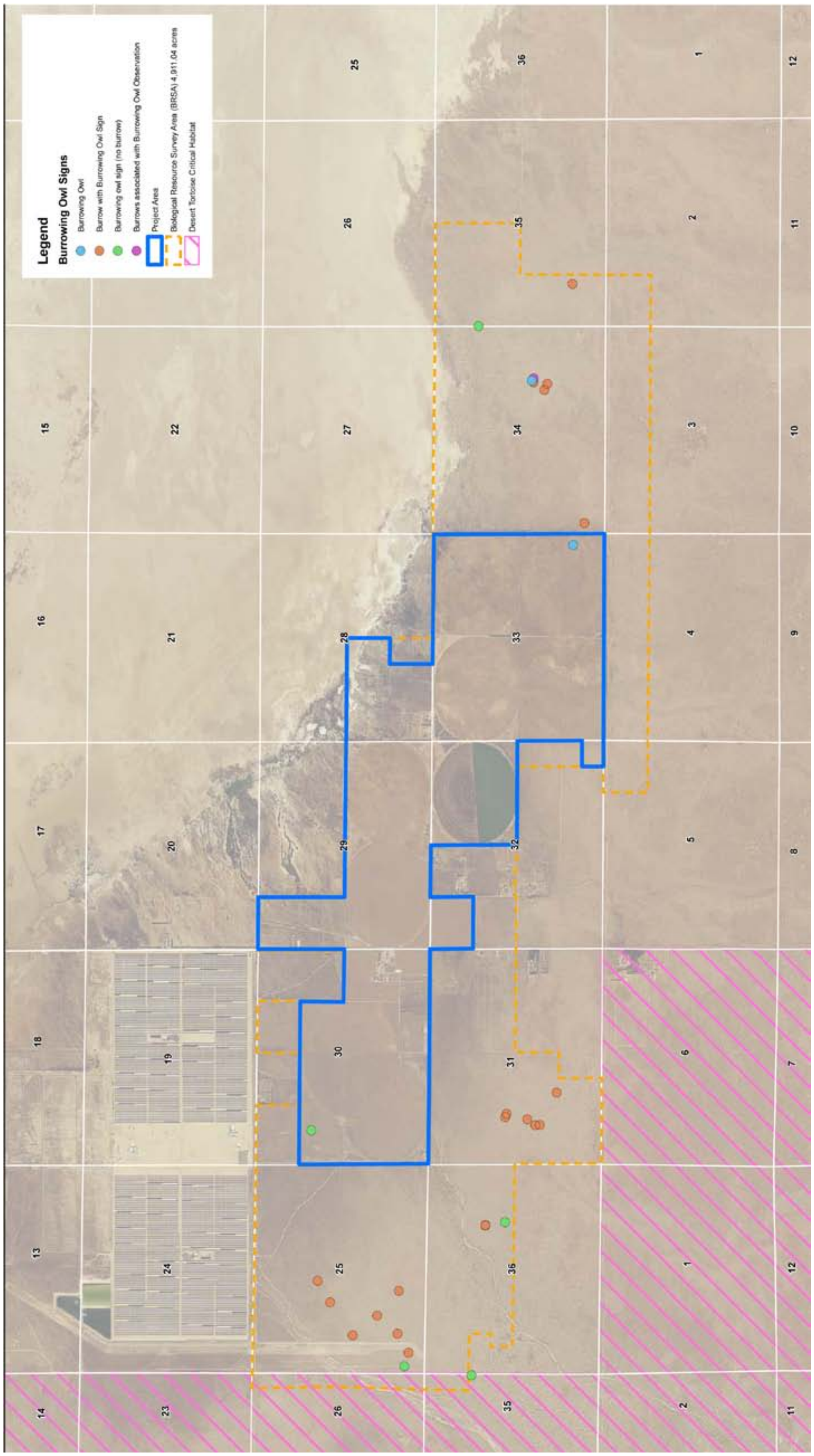

Figure 3.8-7: Burrowing Owl – AMSP/Lockhart Substation Study Area

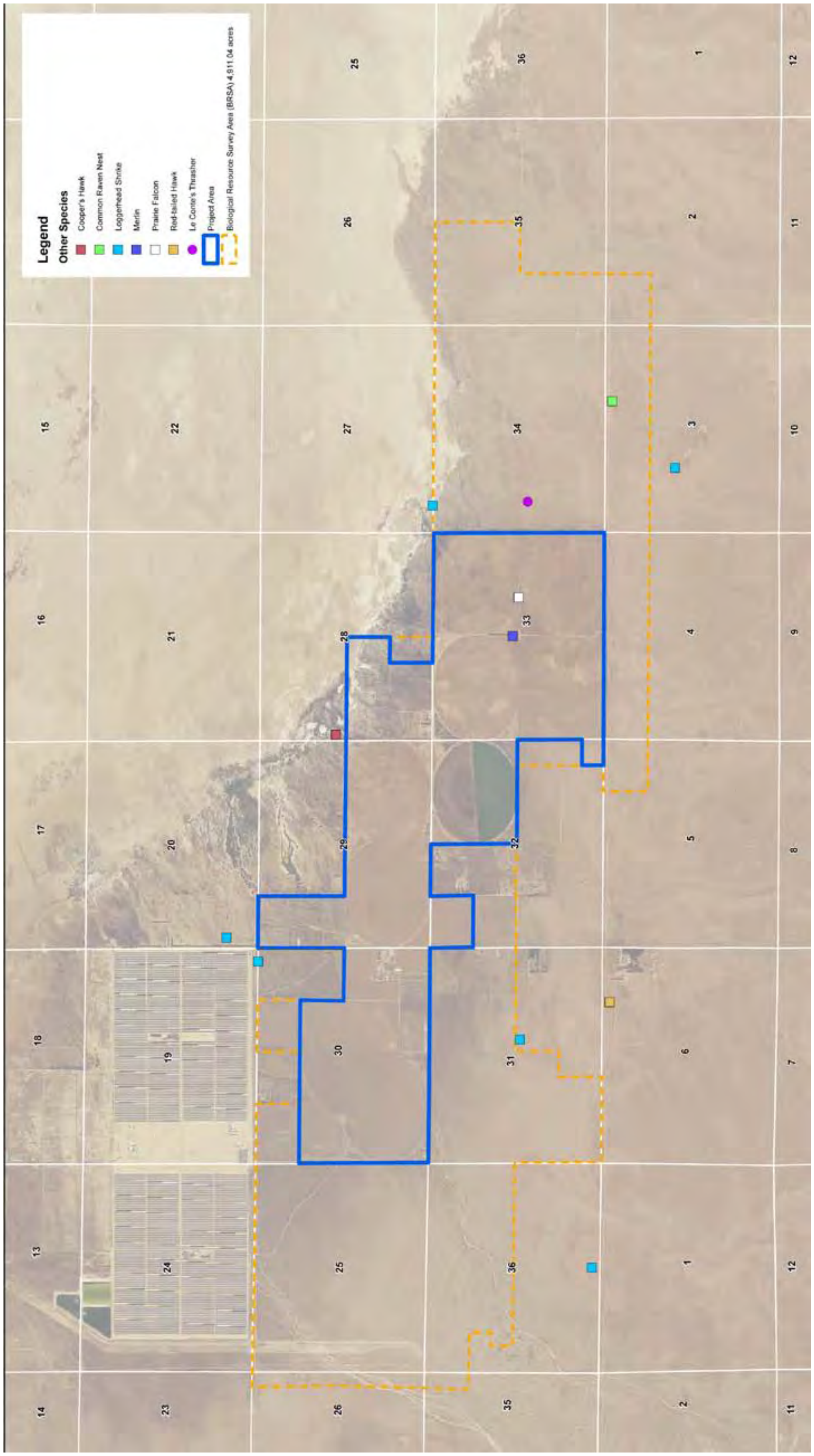

Figure 3.8-8: Other Sensitive Wildlife – AMSP/Lockhart Substation Study Area

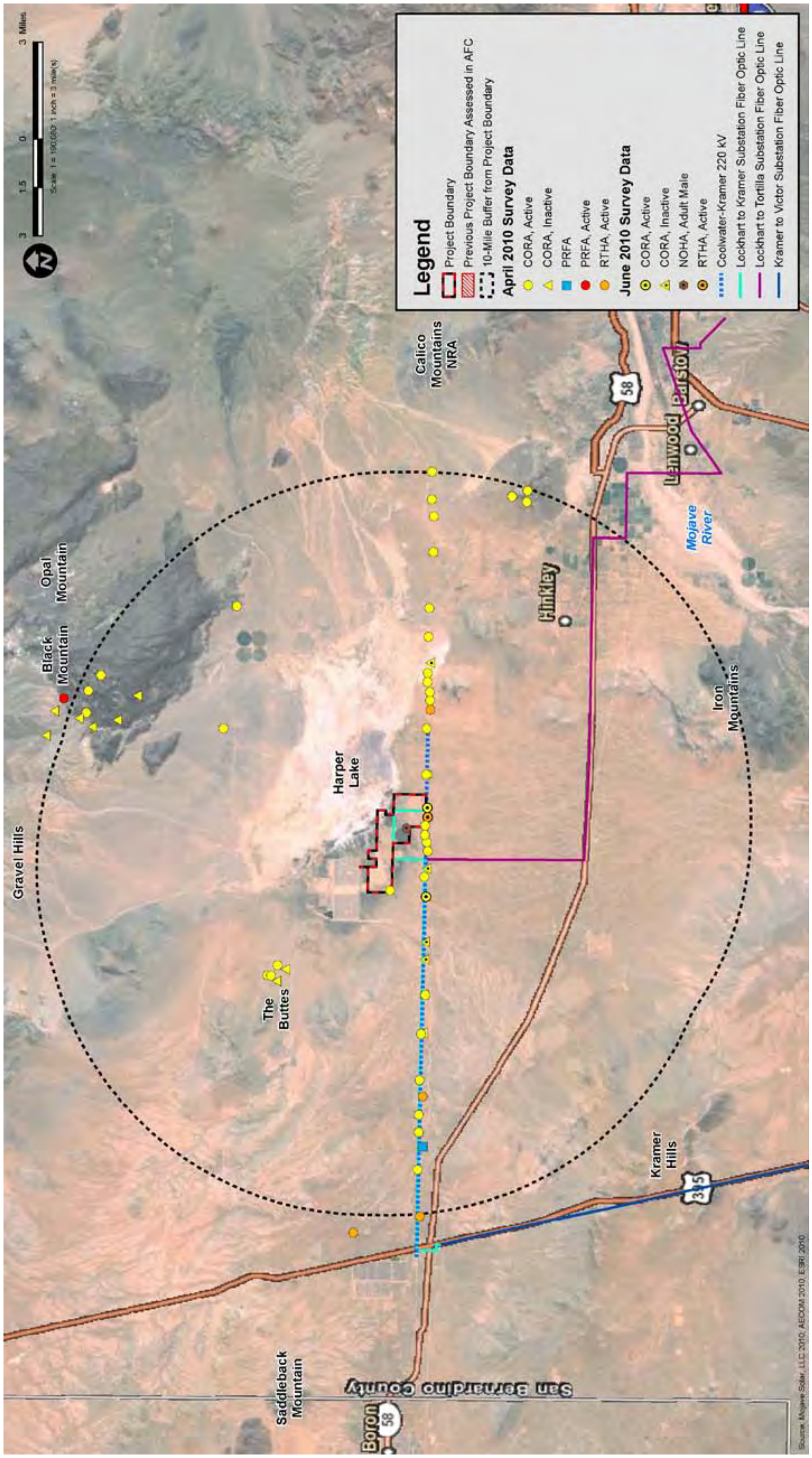

Figure 3.8-9: Golden Eagle Survey Area

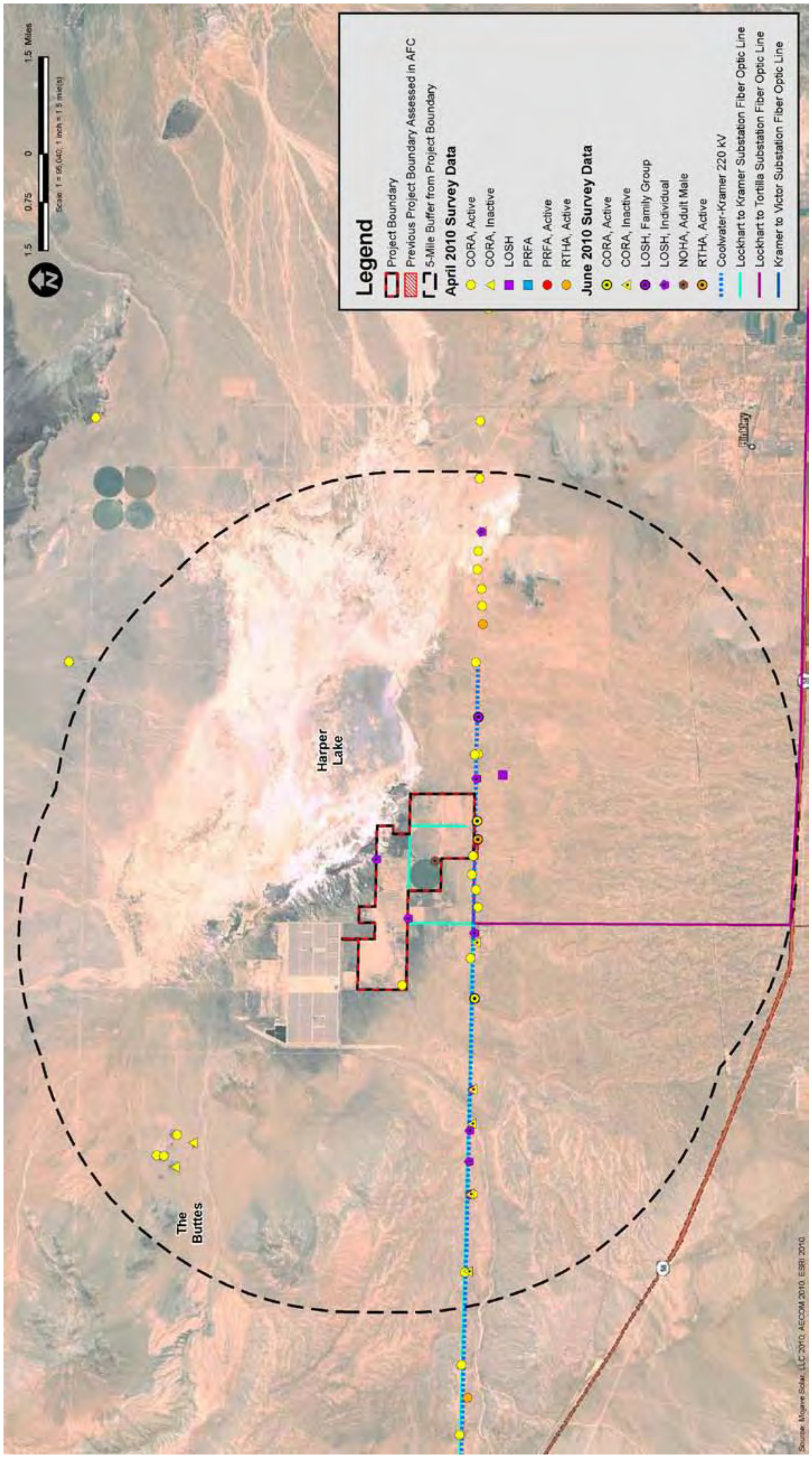

Figure 3.8-10: Swainson's Hawk Survey Area

Sign of recent use of burrows was recorded and the burrows were classed using Dr. Karl's classification system. Scat was measured and classed using Dr. Karl's classification system. All sign locations were recorded using GPS units.

During 2009 DT surveys, no DT individuals were detected; however, several signs of DT were observed, most of which occurred in areas where disturbed desert saltbush scrub is growing. In 2008, surveys for DT resulted in observation of 35 live DT, six of which were within ZOI transects, totaling 41 tortoise observations in 2008. Of the observed tortoises, 33 were adults, six were sub-adults, and two were juveniles. No live DT were observed within the AMSP/Lockhart Substation site during 2008, and the only DT sign observed on the AMSP/Lockhart Substation footprint were five DT carcasses. These carcasses were observed in disturbed desert saltbush scrub habitat. In 2007, only one live DT was documented during surveys, within the 1-mile CEC buffer south of the AMSP/Lockhart Substation site. Year 2006 reconnaissance and site surveys documented four live DT in areas that would eventually be excluded from consideration for development. One of the four tortoises was encountered in the southwestern portion of Section 28, in disturbed desert saltbush scrub. Figure 3.8-6 illustrates tortoise locations.

The AMSP/Lockhart Substation site, which is mainly dominated by abandoned agricultural land, was almost completely devoid of DT sign, with the exception of the observation of five DT carcasses. With the documented presence of DT offsite to the west and east of the AMSP/Lockhart Substation site, the presence of carcasses is likely due to deposition (e.g., from stormwater sheetflow, etc.). The disturbed nature of the AMSP/Lockhart Substation site would not provide for the maintenance of a viable reproductive population of DT on the site. Therefore there is only a slight chance that DT could utilize the site.

Mohave Ground Squirrel

In consultation with USFWS and CDFG, it was determined that surveys for MGS were not required in 2009 based on the findings from past results and consultation with MGS expert Phil Leitner, PhD. In April 2008, Dr. Leitner conducted a habitat assessment of the AMSP site and its immediate vicinity, to provide an estimate of the MGS habitat quality. Dr. Leitner's habitat assessments of the AMSP site and surrounding vicinity (2008 AMSP/Lockhart Substation layout) are included in the CEC AFC (CEC 2009). One MGS was captured south of the AMSP/Lockhart Substation site within the 1-mile buffer during 2007 surveys (Figure 9 in the BA) (EREMICO Biological Services 2007). No MGS were captured during trapping efforts in 2006 (EREMICO Biological Services 2006).

The CNDDB was queried to determine historic occurrences of MGS within approximately 5 miles of the AMSP/Lockhart Substation MGS survey area, which corresponded to the 2008 AMSP/Lockhart Substation layout. In addition, Dr. Leitner's analysis also utilized other records of MGS occurrences collected for a comprehensive database covering the period 1998–2007 (Leitner 2008). Maps prepared for the BLM West Mojave Plan that indicate the locations of lands designated for the MGS Conservation Area were also reviewed (BLM 2005).

Dr. Leitner's 2008 habitat assessment documented that within the AMSP/Lockhart Substation site, there are previously disturbed areas that have reverted to desert saltbush scrub vegetation dominated by cattle saltbush. This is the condition on the northeast quarter section of Section 32, and along the western and southern edges of Section 33. Although these areas are heavily dominated by cattle saltbush and do not provide food resources to support a permanent MGS population, individual animals could be present here from time to time. The southern half of Section 29 and almost all of Section 33 are either barren of vegetation or support only low ruderal growth. The absence of native shrubs in these parts of the AMSP/Lockhart Substation site makes them unsuitable for MGS.

The AMSP/Lockhart Substation site immediately adjoins large areas of creosote bush scrub habitat to the east and south. These adjoining areas appear to be suitable habitat for MGS. West of Harper Lake Road, much of Section 30 was formerly in agricultural production. The formerly cultivated areas of Section 30 now support a monotypic stand of cattle saltbush, of varying density and with numerous barren patches. Although this monotypic cattle saltbush does not provide food resources to support a permanent MGS population, individual animals could be present here from time to time. In the southeastern corner of Section 30, much of the land surface is barren of native shrubs, with weedy ruderal vegetation and some abandoned buildings. These areas are not suitable habitat for MGS. Adjacent to the AMSP/Lockhart Substation site, all of Section 25 and portions of Sections 31 and 36 support desert saltbush scrub. This habitat appears to be largely undisturbed except for past livestock grazing and dumping of trash along dirt roads. It is dominated by cattle saltbush with a number of other native shrub species present. These areas are clearly suitable habitat for MGS. The northeastern corner of Section 31 is barren of native shrubs, with abandoned structures and weedy vegetation. This portion of Section 31 would not support MGS.

The Harper Dry Lake area lies within the MGS Conservation Area as designated in the West Mojave Plan (BLM 2005). However, a 37-square-mile area including the dry lake bed and surrounding private and public lands was excluded from the MGS Conservation Area. All of the AMSP/Lockhart Substation site lies outside of the MGS Conservation Area. The AMSP/Lockhart Substation site west of Harper Lake Road is outside of the MGS Conservation Area. The western boundary of the AMSP/Lockhart Substation site is tone mile east of the MGS Conservation Area boundary.

Immediately east of the AMSP/Lockhart Substation site, Section 34 appears to provide adequate habitat to support a permanent MGS population. Although there are no records of MGS occurrence on these specific parcels, the soils and vegetation here are highly suitable for this species. The fact that 2 years of protocol trapping failed to detect MGS in the saltbush habitat in the NW ¼ of Section 29 indicates that this parcel does not support a permanent population. However, there is sufficient shrub cover here that animals from adjacent habitat to the west and east might occasionally be present. Small peripheral areas of saltbush on the NE ¼ of Section 32 and around the western and southern edges of Section 33 present the same possibility. The occasional presence of MGS in these areas is confirmed by the individual that was seen and captured in 2007. Finally, the S ½ of Section 29 and most of Sections 32 and 33 lack shrub cover and are not suitable habitat for MGS.

There are MGS records for Sections 25, 31, and 36 outside of the AMSP/Lockhart Substation site, but within the study area (2008 AMSP/Lockhart Substation layout) west of Harper Lake Road. Although these records date to surveys conducted in 1988 and 1989, no substantive habitat changes are evident over the past 20 years. The desert saltbush scrub habitat in these parcels is suitable for occupancy by MGS.

There are no MGS records for Section 30, which was probably in agricultural production during these earlier surveys. However, cattle saltbush has invaded the abandoned fields here and this type of shrub cover could be occupied occasionally by MGS moving from adjacent suitable habitat. These portions of Section 30 do not provide the diverse food resources that are necessary to support a permanent MGS population (Leitner and Leitner 1998).

Raptors

Raptor surveys were conducted during the spring and winter of 2007. Surveys were conducted by slowly driving (at 15 to 25 mph) along all dirt and paved roads on the biological resources survey area, which corresponded to the 2008 footprint and a surrounding 500-foot buffer, frequently stopping to scan surrounding terrain and potential perches for raptor species. An additional 1-mile buffer was evaluated for potential raptor habitat, according to CEC guidelines, and was also scanned for raptors during driving surveys. All raptor and nonraptorial soaring bird species were identified and their locations were recorded using GPS units. Inactive and currently active nests were also noted and recorded using GPS. Reported observations of species from previous surveys were also noted and investigated during raptor surveys.

In consultation with resource agencies, it was determined that additional surveys for SWHA and golden eagle would be required. In April 2010, avian expert Pete Bloom, PhD, conducted a helicopter survey for eagles and other raptors. In Late April and early May 2010, a second survey on foot and by car was conducted to detect eagles and other raptors. A pair of golden eagles was detected within the Black Mountain range just outside of the 10-mile survey radius (Figure 3.8-9).

American Peregrine Falcon

The peregrine falcon is not known to breed in the vicinity of the AMSP/Lockhart Substation site; however, the species has undergone recent expansion due to elimination of the use of persistent chemicals, such as DDT. One American peregrine falcon, likely a transient, was detected within the AMSP/Lockhart Substation site perched on the ground north of the active agricultural field on August 14, 2007, during WBO surveys.

Swainson's Hawk

A single SWHA was observed perched on a small shrub within the AMSP/Lockhart Substation site on June 20, 2007, during a raptor survey, and a pair of SWHA was observed soaring over the buffer area on August 13, 2007, during a WBO survey. At least two large, empty stick nests were also found within the 1-mile buffer; however, no birds were seen using these nests and the bird species that used these nests cannot be determined. During the 2010 golden eagle and SWHA surveys, no SWHA or SWHA nests were observed within a 5-mile radius of the AMSP/Lockhart Substation site (Figure 3.8-10).

Golden Eagle

A pair of golden eagles was observed during each of two winter raptor surveys, using the utility towers south and southwest of the AMSP/Lockhart Substation site in the buffer area. Both individuals left the vicinity before the end of the day's survey. While foraging habitat and preferred prey (black-tailed jackrabbit [*Lepus californicus*]) for this species occur on the AMSP/Lockhart Substation site and in the immediate vicinity, preferred nesting habitat, in the form of cliffs, does not occur nearby. However, golden eagle home ranges of 36 to 48 square miles have been recorded in California (Zeiner et al. 1990), and the AMSP/Lockhart Substation site could be located in this pair's home range. During the 2010 golden eagle surveys conducted by Bloom Biological Incorporated, one active nest and two inactive nests were detected to the northeast of the AMSP/Lockhart Substation site outside of the 10-mile survey radius area (Figure 3.8-9). It appeared that the nest had recently failed due to presence of dirt within the nest.

Willow Flycatcher

A willow flycatcher was observed within the AMSP/Lockhart Substation site on June 12, 2007, during the known spring migratory period for a northern subspecies of willow flycatcher (*E. t. brewsteri*) that is known to migrate through this area. No suitable willow flycatcher breeding habitat occurs within the AMSP/Lockhart Substation area; therefore, this individual was likely a transient. Since the willow flycatcher was observed during spring migration, and no suitable breeding habitat occurs onsite, it is unlikely that the willow flycatcher was the southwestern subspecies (*E. t. extimus*), which is federally endangered. Since it is not possible to determine the subspecies of willow flycatcher unless they are heard vocalizing in their breeding habitat, the bird observed was recorded as a willow flycatcher, which is not federally listed. Based on the lack of suitable habitat, the willow flycatcher is not expected to remain or breed within the AMSP/Lockhart Substation site.

<u>Species of Special Concern</u>

In addition to survey results for federally listed and state-listed species described above, surveys were conducted for eight CDFG species of special concern (SSCs) that have the potential to occur on the AMSP/Lockhart Substation site. Those species include American white pelican (*Pelecanus erythrorhynchos*), northern harrier (*Circus cyaneus*), western snowy plover (noncoastal), short-eared owl (*Asio flammeus)*, WBO, loggerhead shrike (*Lanius ludovicianus)*, yellow warbler (*Dendroica petechia)*, and American badger (*Taxidea taxus*). Species observed within the AMSP/Lockhart Substation site, or within the 1-mile buffer include northern harrier, WBO (one in 2008), short-eared owl (one in 2006, a transient), loggerhead shrike (2006, 2007, and 2009), yellow warbler (2007, single migrant), and American badger (2006, one den).

Western Burrowing Owl

WBO surveys were performed according to the protocol established by the California Burrowing Owl Consortium (1993) and guidance issued by CDFG in a 1995 staff report (CDFG 1995). A protocol survey consists of four phases: Phase I includes a determination of suitable habitat in the project area, Phase II includes a survey of all suitable habitat for burrows capable of supporting WBO within the project site and a 500-foot survey buffer, Phase III includes focused surveys of identified burrows for WBO, and Phase IV includes a detailed survey report. Phase I surveys were conducted by qualified biologists who determined that the entire AMSP/Lockhart Substation site includes suitable WBO habitat, and Phase II and III surveys were deemed necessary.

Phase II surveys were conducted from July 30 to August 23, 2007, and April 23 to May 29, 2008, which included mapping of all WBO burrows and sign according to California Burrowing Owl Consortium guidelines within the AMSP/Lockhart Substation site boundaries and a 500-foot survey buffer.

In consultation with CDFG, it was determined that surveys for WBO were not required in 2009. During WBO surveys in 2008, a single WBO was observed within the AMSP/Lockhart Substation site. A pair of WBO that had been observed on the site during 2007 surveys was not observed in the 2008 surveys. A domestic dog was observed within this area, so the loss of the pair may have been due to dog predation, or the owls may have simply moved. During 2006 reconnaissance surveys, four WBO individuals were detected in the eastern section of the AMSP/Lockhart Substation site. Pre-construction 2011 surveys of the site have not documented any current WBO activity or occupation of burrows within or 250 feet adjacent to the site.

Kit Fox

Although the Mojave Desert population of kit fox (*Vulpes macrotis)* is not considered special status by USFWS or CDFG, the species is protected under California regulations[11] and CDFG has expressed interest in analyzing impacts and developing avoidance measures for projects that occur in occupied or potentially occupied kit fox habitat. Two kit fox dens were documented in 2009. The dens were not previously documented during prior surveys; however, desert kit fox scat and digs were detected near a WBO complex, and a juvenile female, which had been struck

[11] Title 14, California Code of Regulations (CCR) § 460 states that Fisher, marten, river otter, desert kit fox, and red fox may not be taken at any time.

by a vehicle, was observed at the intersection of Lockhart Road and Harper Lake Road (EDAW 2006). Preconstruction 2011 surveys of the AMSP/Lockhart Substation site are currently being conducted, and preliminary results have documented three active kit fox den complexes.

American Badger

The American badger was not detected during 2007/2008 surveys; however, one badger den was detected within a survey area that encompassed the entire AMSP/Lockhart Substation site and additional adjacent lands during reconnaissance surveys in 2006 (EREMICO 2006). The den was partially filled in and no recent badger sign was evident, indicating that the den likely had not been used recently.

Northern Harrier

Suitable habitat for this species occurs throughout the survey area. Harriers were detected twice in the 1-mile buffer north of the AMSP/Lockhart Substation site on May 30, 2007, during DT surveys and on August 22, 2007, during WBO surveys. This species was also detected within the AMSP/Lockhart Substation site during 2006 reconnaissance surveys (EDAW 2006) but not mapped.

Short-eared Owl

One short-eared owl was observed within the AMSP/Lockhart Substation site during reconnaissance surveys in 2006 (EDAW 2006); however, because this species tends to be active both day and night and no subsequent observations were recorded, it is likely that this individual was a transient and did not breed within the AMSP/Lockhart Substation site. Breeding habitat occurs within the site within the active and fallow agricultural fields and within the 1-mile buffer on Harper Dry Lake.

Loggerhead Shrike

Loggerhead shrikes were observed during 2007 and 2009 within the AMSP/Lockhart Substation site near the agricultural fields. Suitable breeding and nonbreeding habitat for loggerhead shrike occurs throughout the AMSP/Lockhart Substation site within open areas of habitat associated with the agricultural fields.

American White Pelican

During 2007 surveys, remains of this species were found north of the AMSP/Lockhart Substation site and within the 1-mile buffer. No suitable American white pelican breeding habitat occurs within the AMSP/Lockhart Substation site; therefore, this individual was likely a transient. Based on this lack of suitable habitat, the American white pelican is not expected to remain or breed within the AMSP site.

Western Snowy Plover

The western snowy plover was reported as occurring on the southwestern edge of Harper Dry Lake in 1978, with an estimated count of 94 birds (CDFG 2008). Most individuals seemed to be displaying nesting behavior; one nest was found with three eggs. Since that time, the marsh area has degraded and lost all structure and function; therefore, habitat for this species is not present and it is not expected that this species would utilize the AMSP/Lockhart Substation site The interior population of western snowy plover is not considered a federally listed (threatened) species (CDFG 2009).

LeConte's Thrasher

Le Conte's thrasher was observed in the AMSP/Lockhart Substation site during surveys in 2007 and 2009. Suitable habitat for this species occurs throughout the AMSP/Lockhart Substation site and surrounding 1-mile buffer within the sparsely vegetated proportion of saltbush scrub habitats.

Yellow Warbler

One yellow warbler was observed within the AMSP/Lockhart Substation site during the 2007 surveys. Suitable breeding habitat for this species does not occur within the AMSP/Lockhart Substation site or a 1-mile buffer; therefore, this individual was likely a migrant.

3.8.3.3.2 Telecommunication System

Plants

The potential for special-status plant species occurrence in the fiber-optic corridors is similar to the AMSP/Lockhart Substation site. A reconnaissance survey was conducted in 2010. However, no protocol-level special-status biological surveys have been conducted for the majority of the three alignments. The BLM has indicated that desert cymopterus occurs within the ROW of the Lockhart-Kramer route (Lapre personal communication 2011). Preconstruction surveys for special-status plant species in the unsurveyed portion of the alignment would be conducted to determine the effect, if any, on special-status plant species. CNDDB occurrences within 0.5 mile of the three alignments include desert cymopterus and Barstow woolly sunflower (*Eriophyllum mohavense*). A chaparral sand verbena (*Abronia villosa* var. *aurita*) occurrence is documented within 0.5 mile of the Lockhart to Tortilla fiber-optic segment, in proximity to the Mojave River.

Wildlife

Wildlife habitat and the potential for special-status species occurrence are similar to the AMSP/Lockhart Substation site. A reconnaissance survey was conducted in 2010. However, no protocol-level special-status biological surveys have been conducted for the majority of the three alignments and special-status wildlife presence is unknown. Preconstruction surveys for special-status wildlife species in the linears would be conducted to determine the effect, if any, on special-status wildlife species.

CNDDB occurrences within 0.5 mile of these linears include DT, MGS, WBO, and American badger. It is assumed that DT, MGS, and WBO occur within the alignments of the telecommunication routes. Preconstruction surveys will determine the locations of DT, WBO, and badger. Dr. Phil Leitner conducted a habitat assessment along the telecommunication linears and determined that all lands within the MGS Conservation Area were likely occupied, as well as areas south of the Kramer Substation on Edwards AFB and north of the town of Adelanto to the edge of the MGS Conservation Area (Leitner personal communication, 2010).

The proposed fiber-optic telecommunication system corridors cross USFWS-designated critical habitat for DT in the Fremont-Kramer critical habitat unit (CHU). The Lockhart to Tortilla fiber-optic segment crosses approximately 4.62 miles and the Lockhart to Kramer and Kramer to Victor fiber-optic segments cross 9.96 and 18.2 miles, respectively, of the Fremont-Kramer CHU.

In addition, the proposed fiber-optic telecommunication system corridors cross the MGS Conservation Area. The Lockhart to Tortilla fiber-optic segment crosses approximately 11.38 miles of the MGS Conservation Area, and the Lockhart to Kramer and Kramer to Victor fiber-optic segments cross 12.1 and 17.5 miles, respectively, of the MGS Conservation Area.

The proposed fiber-optic line near the Kramer Substation is located near potential habitat for the Mojave fringe-toed lizard (MFTL). The MFTL is a CDFG SSC and is considered sensitive by BLM. MFTLs prefer sand dune habitat, and there is no sand dune habitat within the fiber-optic alignment.

Raptors

Raptor surveys will be conducted during the winter of 2010. Surveys will be conducted by slowly driving (at 15 to 25 mph) along the linears, frequently stopping to scan surrounding terrain and potential perches for raptor species. All raptor and nonraptorial soaring bird species will be identified and their locations will be recorded using GPS units. Inactive and currently active nests will also be noted and recorded using GPS.

Coordination with USFWS and BLM determined that golden eagle surveys are not required for the fiber-optic telecommunications corridors due to their location and the implementation of Avian Power Line Interaction Committee guidelines and other avian avoidance measures.

3.8.4 Environmental Consequences

Biological resources may be either directly or indirectly impacted by a project, and direct and indirect impacts may be either permanent or temporary in nature.

3.8.4.1 Proposed Action

3.8.4.1.1 AMSP and Lockhart Substation

Vegetation Communities/Cover Types

Implementation of the AMSP/Lockhart Substation would affect vegetation on and surrounding the site. Construction, operation, and maintenance activities for the AMSP and Lockhart Substation would cause the loss of native vegetation communities and introduction or spread of invasive weeds.

Loss of native vegetation communities that would be directly and permanently impacted are summarized in Table 3.8-2. Calculations for the impacts to biological resources were based on the assumption that the entire AMSP/Lockhart Substation site footprint (1,776.88) would be completely, directly, and permanently impacted. However, most of this land (1,278 acres) is disturbed, developed or in current agricultural production (128 of the 1,278 acres), and provides low-quality habitat for special-status plant species (EDAW 2009). Implementation of avoidance and minimization measures that include minimizing effects on vegetation, managing invasive species, work crew education, and use of an authorized biologist during construction would avoid or greatly reduce effects on native vegetation communities.

Potential indirect impacts could occur as a result of grading activities. Ground-disturbing activities could adversely affect vegetation communities offsite by altering adjacent vegetation boundaries and creating disturbed areas that are more conducive to invasion by exotic species (Westbrooks 1998; D'Antonio and Vitosek 1992). The introduction and invasion of exotic species, such as the Saharan mustard, could potentially reduce native plant population growth, dispersal, and recruitment.

Implementation of avoidance and minimization measures and BMPs to prevent loss of habitat from erosion loss, implemented pursuant to CEC License Decision COC Bio-7 and detailed in Appendix S, would reduce the potential spread of invasive weeds and impacts to native vegetation. In addition, pursuant to CEC License Decision COC BIO-16, a Tamarisk Eradication Monitoring and Reporting Plan will include proposed methods for tamarisk removal and treatment, monitoring and maintenance procedures/timeline, irrigation, success standards and contingency measures, and monitoring and maintenance objectives to prevent the reinvasion of undesirable weeds and/or invasive wildlife species for a minimum of 5 years. The plan also will include identification on a map of the location and size of nonnative vegetation to be removed, and the methods proposed to remove and dispose of invasive wildlife species.

Table 3.8-2: Vegetation Communities/Cover Types and Anticipated Impact Areas

Vegetation Communities and Other Cover Types[1]	AMSP and Lockhart Substation (Acres)[2]		Fiber-optic Telecommunication System (Acres)[3]		Total Acreage	
		Permanent		Permanent		Permanent
Desert Saltbush Scrub		0.74		7.81		8.55
Disturbed – Desert Saltbush Scrub		1.3		0		1.30
Mojave Creosote Bush Scrub		6.0		0.04		6.04
White Bursage Scrub		0		12.8		12.8
Joshua Tree Woodland		0		0		0
Desert Sink Scrub		39.6		0		39.60
Tamarisk Scrub		13.2		0.11		13.31
Mojave Desert Wash Scrub		1.9		0		1.90
Other Cover Types						
Playa Lakebed		9.44		0		9.44
Nonvegetated channel/floodplain		0		0		0
Ephemeral Dry Wash		0		0.00		0.00
Disturbed – Saltbush Scrub Regrowth		223.8		0		223.8
Fallow Agricultural-Saltbush Scrub Regrowth		202.9		0		202.90
Fallow Agricultural-Ruderal		832.7		0.55		833.25
Active Agricultural		122.6		0.33		122.93
Developed		256.1		1.07		257.17
Disturbed		66.6		0.45		67.05
Total Acreage		1,776.88		23.16		1,800.04

1 Holland 1986
2 EDAW 2009
3 Based on preliminary engineering for new pole construction, permanent impacts are assumed to consist of 4,500 square feet per pole. New underground trenching would require approximately 36-inch-wide trench by 225 feet, 395 feet and 500 feet in length for Kramer to Victor linear and 36-inch-wide trench by 400 feet on the Lockhart to Tortilla linear. Refer to Table 2-2 for footprint/disturbance assumptions per route.

Wildlife

Implementation of the AMSP/Lockhart Substation would affect general wildlife and wildlife habitat. Construction, operation, and maintenance activities could cause wildlife disturbance, displacement, injury, and mortality.

Indirect impacts to wildlife could occur from loss of habitat, fragmentation, potential for spread of noxious species, and potential effects to avian species from evaporation ponds.

With the implementation of avoidance and minimization measures, adverse effects on general wildlife at the AMSP/Lockhart Substation site would be avoided. A list of general impact avoidance and minimization measures that would apply to all AMSP/Lockhart Substation activities during construction and operation are provided in Appendix S. These measures are standard practices designed to minimize and avoid environmental degradation.

In addition, the CEC License Decision issued for the AMSP/Lockhart Substation requires implementation of the following measures to avoid and/or minimize adverse impacts to wildlife species:

1. Pursuant to CEC License Decision COC BIO-17, to ensure that the project does not have an adverse impact on bird species, Mojave Solar will prepare and implement a Bird Monitoring Study to monitor the death and injury of birds from collisions with facility features such as reflective mirror-like surfaces and from heat, and bright light from concentrating sunlight. The study design shall be approved by the CEC in consultation with CDFG and USFWS. The Bird Monitoring Study shall include detailed specifications on data and carcass collection protocol and a rationale justifying the proposed schedule of carcass searches. The study shall also include seasonal trials to assess bias from carcass removal by scavengers as well as searcher bias.

2. Pursuant to CEC License Decision COC BIO-19, to minimize the effect that the AMSP's evaporation ponds would have on wildlife, ASI shall design and implement an Evaporation Pond Monitoring and Adaptive Management Plan that meets the requirements of USFWS, CDFG, RWQCB and the CEC. The objective of the plan is to define the monitoring and reporting procedures as well as triggers for adaptive management strategies that shall be implemented to prevent wildlife mortality at the evaporation ponds.

Special-status Species

<u>Plants</u>

No federally or state-listed plants were detected within the AMSP/Lockhart Substation site during surveys in 2007 through 2009. Therefore no direct or indirect impacts to federally listed or state-listed plant species would occur from construction activities.

Indirect impacts to special-status plant species existing outside the AMSP/Lockhart site may arise from population fragmentation and the introduction of nonnative weeds. Population fragmentation could affect pollinator activity and hence gene flow (Culley et al. 2007). The introduction and establishment of invasive weeds within, or adjacent to, special-status plant populations can adversely affect native species by reducing growth and recruitment. In addition to population fragmentation, runoff and sedimentation, erosion, fugitive dust, and unauthorized access by construction workers could cause indirect impacts to special-status plant species. Unauthorized access by construction workers and their vehicles can trample and destroy individuals outside of, but immediately adjacent to, the construction area. These indirect impacts would be avoided, however, through implementation of the impact avoidance and minimization measures.

Wildlife

Desert Tortoise. Direct permanent impacts to DT are possible because evidence of DT was observed within the AMSP/Lockhart Substation study area during surveys. Little recent evidence of DT (e.g., DT, scat, or burrows) was found in the AMSP/Lockhart Substation study area; however, carcass parts were observed during surveys in 2007 through 2009. During 2006 reconnaissance surveys, one DT was encountered onsite (EREMICO 2006). This sighting was in a disturbed area that had been recolonized by saltbush shrubs. During surveys, DT were observed adjacent to the site and therefore could wander onto the site and also construct burrows. Thus, direct permanent impacts to DT could occur as a result of habitat loss due to AMSP/Lockhart Substation construction. This would include the loss of 428.4 acres composed mainly of fallow agricultural and disturbed areas with a prevalence of saltbush scrub regrowth. These areas represent poor-quality habitat that would not be expected to support maintenance or recovery of the species and would arguably not support an individual DT. Based on the low abundance and location of DT sign in 2007, 2008, and 2009 surveys, none of the AMSP/Lockhart Substation study area is considered to be occupied DT habitat.

Direct impacts to DT could result from vehicle strikes due to an increase in vehicle traffic while the AMSP/Lockhart Substation is under construction and operation. This could occur on Harper Lake Road and other access roads used for construction and operation.

As required by CEC License Decision COC BIO-11, a Desert Tortoise Clearance and Relocation/Translocation Plan was developed and reviewed by DT experts in private industry and in USFWS, CDFG, CEC and BLM; it will be finalized 45 days prior to ground disturbance. The plan will include measures, to minimize potential direct impacts to DT as a result of AMSP and Lockhart Substation construction, operations, and decommissioning activities, with particular attention to the conditions of the site and the tortoise population in the surrounding area. Implementation of the impact avoidance and minimization measures, as well as the proposed compensation strategy, will avoid, reduce, and fully mitigate direct impacts to DT. These measures are detailed in Appendix S and the draft Plan is attached as Appendix M-1.

The Plan describes the following, in detail:

- Clearance surveys – timing relative to tortoise behavior and temperature considerations; transects; qualifications of surveyors
- Perimeter fence requirements
- Surveys and monitoring during perimeter fencing and activities that may occur outside the AMSP/Lockhart Substation fence

- Data collected on all tortoises, including health assessments
- Tortoise handling and transmittering; temperature considerations; authorized handlers
- Immediate post-release intensive monitoring and long-term monitoring, including resident tortoises in the area surrounding the release sites
- Surveys and assessments of the resident tortoises surrounding the AMSP/Lockhart Substation site
- Carrying capacity issues
- Nest relocation
- Disposition of injured or dead tortoises

Based on the data from multiple years of surveys and the degraded site conditions, it is expected that no DT will need to be moved from the AMSP/Lockhart Substation site during clearance surveys. However, some tortoises may require relocation during fence construction. Any tortoises moved outside the site currently live there, so population augmentation through relocation/translocation will not occur; furthermore, tortoises are highly likely to be already familiar with the area around the site and have established home ranges outside the site.

In the event that DT require either relocation (i.e., moved <500 m) or translocation (moved >500 m), the Plan describes the conditions under which those tortoises can be moved. Multiple relocation sites and two translocation sites have been designated, all on AMSP land except one translocation site, which would be on BLM land (Figure 5 in Appendix M-1). All translocations will follow the procedures detailed in the Plan. Specific avoidance and minimization measures for the DT, a federally listed threatened species, are included in Appendix S.

Potential indirect impacts to DT include the possibility of common raven predation associated with the installation of evaporation ponds and the introduction of new elevated perching sites (e.g., fiber-optic line poles) (Boarman 2003). Because there are existing raven subsidies such as the transmission line and structures and the existing evaporation ponds at the Harper Lake SEGS, the addition of identical subsidies is not likely to result in a further increase in ravens. Webb (2001) found that additional identical subsidies did not increase raven densities or use of a particular site. Furthermore, substantial raven subsidies currently in place due to agricultural activities would be eliminated by the AMSP/Lockhart Substation element of the proposed Project.). Potential impacts to DT from ravens would be avoided or minimized by implementation of a raven monitoring and control plan, required by CEC License Decision COC BIO-18. This plan will identify conditions associated with the AMSP/Lockhart Substation that might provide raven subsidies or attractants, describe management practices to avoid or minimize conditions that might increase raven numbers and predatory activities, describe control practices for ravens, address monitoring and nest removal during construction and for the life of the AMSP/Lockhart Substation, and discuss reporting requirements. The measures from the Common Raven Monitoring, Management, and Control Plan are listed in Appendix S and a draft of that plan is located in Appendix M-2.

Indirect impacts to DT habitat caused by changes in drainage patterns that would potentially alter offsite vegetation communities would be minimized by project design. Drainages that naturally flow into the AMSP/Lockhart Substation site were blocked by past activities onsite, thus resulting in deposition of sediment and flooding on the upslope side of the site. This would be minimized by implementing appropriate design and construction measures (e.g., grading and compacting the entire footprint of the solar array, thereby reducing onsite erosion). This would include directing water to the drainage channels, which would flow into Harper Dry Lake.

Impacts to DT habitat associated with the construction of the AMSP and Lockhart Substation, and proposed compensation for those impacts, are outlined in Table 3.8-3.

Table 3.8-3: Impacts to Desert Tortoise Associated with the AMSP Site

Habitat	Mitigation Ratio	Impact (acres)	Total Mitigation Acreage
Undisturbed desert saltbush scrub	5:1	0.74	3.7
Mojave creosote bush scrub	5:1	0	0.0
Disturbed desert saltbush scrub	2:1	1.3	2.6
Disturbed desert saltbush-regrowth	0.5:1	223.8	111.9
Fallow agricultural saltbush-regrowth	0:1	202.9	0
Total Acreage			**118.2**

Golden Eagle. No direct impacts to golden eagle are anticipated. The loss of potential foraging habitat would be considered an adverse indirect impact to the golden eagle, but would be minimized by the implementation of environmental protection and conservation measures, including compensation, as presented in Appendix S. In summary, the measures include the purchase of compensation lands, provision of a continuous water supply to the Harper Dry Lake marsh, funding the long-term management of the compensation lands, and payment of funds to the Renewable Energy Action Team Account established with the National Fish and Wildlife Foundation to help fund other adaptive management actions as seen appropriate by BLM, USFWS, and CEC.

Swainson's Hawk. No direct impacts to SWHA, a state-listed species, are anticipated. If SWHA are present and/or nesting onsite or nesting occurs within 0.5 mile of the AMSP/Lockhart Substation site, indirect impacts could result from the removal of foraging habitat currently provided by the agricultural activity and abandoned fields. Based on habitat assessments, development of the site could result in direct permanent impacts to some portion of the AMSP/Lockhart Substation site that supports suitable SWHA foraging habitat. Breeding season SWHA surveys were conducted in 2010, and no SWHA or evidence of nesting activity was documented for the species on the AMSP/Lockhart Substation site or within a 10-mile survey area surrounding the site. However, implementation of the impact avoidance and minimization measures, as well as compensation strategy, would reduce and fully mitigate indirect impacts to SWHA resulting from the AMSP/Lockhart Substation. These measures are detailed in Appendix S.

Mohave Ground Squirrel. Although the MGS habitat assessment concluded that the AMSP/Lockhart Substation would not support a resident MGS population, the presence of suitable habitat adjacent to the site and one MGS documented on the southern border of the site in 2007 suggest that the species could occur as an infrequent visitor. Therefore, it is possible that AMSP/Lockhart Substation construction and operation could result in incidental take of individuals due to vehicle strikes from construction activities or workers traveling to and from the site.

Direct permanent impacts to MGS, a state-listed species, could occur as a result of habitat loss due to AMSP/Lockhart Substation construction. This would include loss of marginal MGS habitat within the site, made up mainly of fallow agricultural and disturbed areas with saltbush scrub regrowth dominated by cattle saltbush. Although these areas do not provide adequate food resources to support a resident MGS population, individual animals could occur onsite as transients.

The AMSP/Lockhart Substation site adjoins large areas of Mojave creosote bush scrub and desert saltbush scrub to the west, east, and south. These adjoining areas appear to be suitable habitat for MGS and might serve as a source of dispersing juveniles that could be temporarily present in saltbush regrowth vegetation.

The Harper Dry Lake area is surrounded by the MGS Conservation Area as designated in the WEMO Plan (BLM 2005). However, an area totaling over 30 square miles, including the dry lake bed and surrounding private and public lands, was excluded from the MGS Conservation Area. The entire AMSP/Lockhart Substation site lies outside of the MGS Conservation Area.

Implementation of the impact avoidance and minimization measures, as well as compensation land acquisition, would reduce and fully mitigate the direct impacts of the AMSP/Lockhart Substation to MGS.

Indirect impacts to MGS could occur from increased raptor and common raven predation associated with the installation of evaporation ponds in addition to elevated perching sites, including the interconnection facilities and support structures, as described above for DT.

In addition, indirect impacts to MGS from potential deposition of sediment loads during heavy rain events could impact existing MGS habitat; however, these impacts would be minimized by design features (i.e., adequate drainage channels and compaction of the entire footprint of the solar array, thereby reducing onsite erosion). Similarly, indirect impacts to MGS habitat by potential changes in drainage patterns that result in alteration of offsite vegetation communities would be minimized by AMSP/Lockhart Substation design features.

In summary, implementation of the impact avoidance and minimization measures (Appendix S), as well as compensation land acquisition would reduce and fully mitigate indirect impacts to MGS.

Impacts and mitigation for MGS associated with AMSP/Lockhart Substation construction and operations are outlined in Table 3.8-4.

Table 3.8-4: Impacts to Mojave Ground Squirrel Associated with AMSP Site

Listed Species	Mitigation Ratio	Total Impact[1]	Total Mitigation Acreage
Mohave Ground Squirrel	0.5:1	428.4	214.2
Total Mitigation Acreage			**214.2**

Special-status Wildlife Species. Direct impacts to WBO and other nonlisted special-status wildlife species during AMSP/Lockhart Substation construction and operation could result from crushing of occupied burrows and destruction of nests; collisions with construction and maintenance vehicles; and clearing of breeding, foraging, and wintering habitat as a result of AMSP/Lockhart Substation development.

Implementation of the impact avoidance and minimization measures would reduce and fully mitigate the direct impacts of the AMSP/Lockhart Substation to WBO and other nonlisted, special-status wildlife species. A Burrowing Owl Monitoring and Mitigation Plan will be prepared, in accordance with CEC License Decision COC BIO-13, and will include measures to avoid and minimize impacts to the species (Appendix M-3). Specific avoidance measures for WBO, a state SSC, are listed in Appendix S.

Three WBO have been documented to occur within the AMSP/Lockhart Substation site in different areas, although one individual may have been depredated prior to the final survey. Assuming that each detected WBO is part of a mated pair and therefore the site supports three WBO pairs, the anticipated mitigation is anticipated to be 19.5 to 58.5 acres of suitable habitat at a location approved by CDFG, per the California Burrowing Owl Consortium mitigation guidelines adopted by CDFG (see Appendix S). Funding for the long-term management of the land preserved would also be provided (on a per-acre-of-impact basis). However preconstruction surveys will determine the exact number of burrowing owls that occur onsite.

Northern harriers, loggerhead shrikes, horned larks, and LeConte's thrashers detected within the AMSP/Lockhart Substation site may be permanently directly impacted through the loss of breeding habitat. Within the site the following species may be indirectly impacted through the loss of foraging habitat: peregrine falcon, Cooper's hawk, merlin, prairie falcon, and short-eared owl.

If construction is scheduled to occur during nesting season, a nesting bird survey (in addition to the WBO survey) will be conducted within permanent (and temporary) impact areas. If nesting birds, including but not limited to special-status species, are detected in these areas, the nest will be flagged and no construction activity will take place near the nest until nesting is complete (nestlings have fledged or nest has failed) or CDFG, USFWS, and CEC agree that construction can proceed with the incorporation of agreed-to monitoring measures as outlined in CEC License Decision COC BIO-8.

Since active kit fox dens were documented in the ongoing preconstruction surveys of the AMSP/Lockhart Substation site, the appropriate avoidance and minimization measures specified in Appendix S related to the species will be implemented, ensuring that no adverse impact will occur to the kit fox. If American badger dens are discovered during DT or WBO preconstruction surveys, avoidance and minimization measures as specified in Appendix S will be applied to ensure that there is no adverse impact to the species.

3.8.4.1.2 Telecommunication System

Vegetation Communities/Cover Types

Estimates for temporary construction impacts and permanent impacts were included for new poles, new trenching, access, and pulling and splicing disturbance; however, the exact location and specifications of disturbance have yet to be determined as part of preliminary engineering. Potential temporary and permanent direct impacts to vegetation communities in the fiber-optic telecommunication system corridor are summarized in Table 3.8-2. The calculations in Table 3.8-2 for the fiber-optic lines include all three routes combined.

<u>Lockhart to Tortilla Substation Fiber-optic Line</u>

Approximately 0.03 acre of developed area would be temporarily impacted from 400 feet of new trenching. A total of three replacement poles have been identified along this route. Activities associated with pole replacement, access, cable stringing, and pulling and splicing are expected to disturb a total of 9.83 acres of land (refer to Table 2-2 for footprint/disturbance assumptions and Table 3.8-2 for vegetation impacts). This would consist of 6.61 acres of desert saltbush scrub, 1.67 acres of white bursage scrub, 0.11 acre of tamarisk scrub, 0.33 acre of fallow agriculture, 0.33 acre of active agriculture, 0.24 acre of disturbed land, and 0.54 acre of developed land. Existing utility access roads would be used for short-term construction access and cable stringing.

<u>Lockhart to Kramer Substation Fiber-optic Line</u>

Approximately 1.85 acres of land would be disturbed along this route for project implementation (Table 2-2). Impacts along this alignment effectively begin from Harper Lake Road heading west along the existing Coolwater–Kramer No. 1 and No 2 220-kV transmission line corridor. The vegetation communities along this 12-mile section are relatively undisturbed and intact.

Four replacement poles have been identified along this route. Pole replacement, and pulling and splicing activities are anticipated to impact 0.92 acre of desert saltbush scrub, 0.44 acre of white bursage scrub, 0.22 acre of fallow agriculture, and 0.22 acre of developed land.

Kramer to Victor Substation Fiber-optic Line

Approximately 7.75 acres of white bursage would be impacted from construction of 30 new poles required for this stretch of the route. Areas of Joshua tree woodlands would likely be avoided. Approximately 0.07 acre of developed area would be temporarily impacted from 1,120 feet of new trenching. (Refer to Table 2-2 for footprint assumptions.) Fiber-optic cable pulling and splicing activities along the entire route would impact 2.83 acres of white bursage scrub, 0.02 acre of Mojave creosote bush scrub, 0.33 acre of desert saltbush scrub, 0.14 acre of disturbed land, and 0.31 acre of developed land within existing utility transmission line corridors.

Wildlife

Wildlife species occurring along the proposed fiber-optic telecommunication system corridors are similar to those described for the AMSP/Lockhart Substation site.

Effects on wildlife species associated with fiber-optic installation include construction-related noise disturbance, disruption of movement, and wildlife mortality. Noise associated with construction activities would be limited in duration and have a minor effect on general wildlife species. Construction effects also include temporary habitat loss and disruption of movement. Initial impacts along an existing ROW would result in temporary disturbance to wildlife.

The proposed Project includes the installation of new fiber-optic communication cables between the Lockhart Substation and the Tortilla, Kramer, and Victor substations by means of stringing cable on existing poles or constructing new poles. Approximately 85 miles of fiber-optic cable is proposed for these three routes.

Although the actual permanent footprint for the fiber-optic poles would be considerably less than the available habitat within the ROW, the poles and overhead lines provide perching opportunities for predatory species and may therefore modify the behavior for certain species both within and beyond the ROW. Transmission line structures provide perches and nesting areas for raptors and ravens (Steenhof et al. 1993). Thus, introduction of new poles may result in increased predation within the home range of raptors or ravens (Engels and Young 1992). However, since there are existing power lines and structure adjacent and along the proposed new fiber-optic poles, these new perching opportunities would have little increase on existing effects to wildlife. The fiber-optic lines would also be constructed in accordance with Avian Power Line Interaction Committee design guidelines (Avian Power Line Interaction Committee 2006; Avian Power Line Interaction Committee and USFWS 2005). In the long term, birds would continue to use the area for nesting, roosting, foraging, and dispersal. General wildlife species would continue to use the habitat for dispersal.

Special-status Species

Plants

Special-status plant species potentially occurring along the fiber-optic telecommunication system corridors are similar to those described for the AMSP/Lockhart Substation site.

Potential permanent, direct, or indirect impacts to listed plant species are currently unknown because clearance surveys have not been conducted. However, it is likely negligible effects would occur from construction and operation of the proposed fiber-optic telecommunication system. No federally listed or state-listed plants are documented within the proposed corridors.

Potential direct or indirect impacts to special-status plant species are currently unknown because clearance surveys have not been conducted to map the exact locations of plants. The BLM has indicated that desert cymopterus occurs within the ROW of the Lockhart to Kramer route. However, it is likely negligible effects would occur from construction and operation of the proposed fiber-optic telecommunication system. Implementation of the general avoidance and minimization measures as presented in Appendix S would avoid or reduce the potential direct and indirect impacts to nonlisted, special-status plant species as a result of the telecommunication system.

Wildlife

Special-status wildlife species potentially occurring along the fiber-optic telecommunication system corridors are similar to those described for the AMSP/Lockhart Substation site.

Desert Tortoise. Impacts to DT are possible because portions of the linear routes cross known DT habitat. Direct impacts to DT could result from vehicle strikes due to an increase in vehicle traffic while the fiber-optic lines are under construction. Temporary impacts to designated DT critical habitat could also occur where fiber-optic lines would be strung on existing poles. These temporary disturbance areas include approximately 5.9 miles along the Lockhart to Tortilla fiber-optic segment that crosses the Superior-Cronese CHU, 13 miles along the Lockhart to Kramer segment that crosses the Fremont-Kramer CHU, and 18.2 miles along the Kramer to Victor fiber-optic segment that crosses the Fremont-Kramer CHU. Approximately 60 square feet (less than 0.01 acre) in the Fremont-Kramer CHU could be permanently impacted from construction of 30 new poles along the Kramer to Victor Substation fiber-optic line.

Proposed project design features and avoidance measures, especially site fencing and a preconstruction DT clearance and acquisition of compensation lands, would avoid or minimize potential direct impacts to DT. A Desert Tortoise Clearance and Relocation/Translocation Plan will be developed that outlines avoidance, minimization, and mitigation measures and translocation activities (the draft plan is found in Appendix M-1). Specific measures listed in Appendix S will be implemented to avoid or reduce impacts.

Impacts to DT habitat and proposed mitigation measures are outlined in Table 3.8-5.

Table 3.8-5: Impacts to Desert Tortoise Habitat from Fiber-optic Lines

Habitat	Mitigation Ratio	Impact[1,2] (acres)	Total Mitigation Acreage
Undisturbed desert saltbush scrub	5:1	0.0066 (288 sq ft)	0.03
Mojave creosote bush scrub	5:1	0.0211 (924 sq ft)	0.11
Desert scrub within DWMA[3] (including impacts to DT Critical Habitat)	5:1	16.77	83.85
Desert scrub outside of DWMA[3,4]	1:1	2.89	2.89
Outside of DWMA within existing road shoulder adjacent to desert scrub[3,4]	0.5:1	3.45	1.73
Total Acreage		**23.1**	**88.6**

1 The total impact reflects those suitable DT habitat areas within the fiber-optic telecommunication study area boundary, which assumes direct, permanent effects within the limits of the boundary.

2 The total impact reflects those suitable DT habitat areas along the SCE fiber-optic lines where new construction will be required. Acreage represents permanent impact areas. Temporary impacts will be revegetated, per BIO-7 in Appendix S, but will also be mitigated as permanent impacts, due to the slow recovery process associated with the desert ecosystem. Specific habitat types are currently unknown for the SCE fiber-optic lines, since the precise locations of the proposed construction have not been fully determined.

3 The impacts for the portion of the SCE fiber-optic upgrades that require estimation (e.g., pulling and splicing sites) are assumed to be proportional to the linear distances occurring inside the DWMA versus outside, unless the location of an impact is generally known (e.g., 5-mile access road through Fremont-Kramer and Superior-Cronese DWMAs, parallel to Harper Lake Road). For areas outside of the DWMA, impact estimates are assumed to be proportional to the length of the linear distances that cross through areas where both sides of the route are adjacent to desert scrub vegetation, versus the route running along paved roads/shoulders immediately adjacent to desert scrub. These impacts to the DWMA include 11.51 acres of impact to the Fremont-Kramer critical habitat Unit along the Lockhart to Tortilla (0.55 acre), Lockhart to Kramer (1.21 acres), and Kramer to Victor (9.75 acres) SCE fiber-optic routes. An impact of approximately 0.01 acre is estimated to occur within the DWMA, but on private land. This small impact to private land within the DWMA will also be mitigated at the proposed 5:1 ratio.

4 Areas outside of the DWMA, but within desert scrub habitat, include the majority of the southern portion of the Kramer to Victor route, as well as the patches of open space supporting desert scrub along the Lockhart to Tortilla route outside the Tortilla Substation. Large stretches categorized as outside of the DWMA and along existing roads or disturbed shoulders include portions of the Lockhart to Tortilla route along SR-58 and in the vicinity of the Hinkley Substation through the City of Barstow, and along the Kramer to Victor route in the vicinity of the City of Adelanto.

Golden Eagle. The installation of the fiber-optic lines would have a negligible effect on foraging habitat. Implementation of the Avian Power Line Interaction Committee measures will ensure that impacts to golden eagles are avoided.

Swainson's Hawk. If SWHA are present and/or nesting onsite or nesting occurs within 0.5 mile of the fiber-optic telecommunication system, impacts could potentially result from removal of foraging habitat. However, implementation of the impact avoidance and minimization measures would reduce impacts to SWHA. Because preconstruction nest surveys and impact avoidance and protection measures for migratory birds would likely be required, negligible impacts to SWHA are anticipated.

Mohave Ground Squirrel. Impacts to MGS are possible because of the presence of suitable habitat and several documented occurrences within 0.5 mile of the proposed fiber-optic telecommunication system. Therefore, construction activities could result in incidental take of individuals due to vehicle strikes. Impacts to the MGS potentially occur as a result of habitat loss during project construction. Using project components as outlined in Table 2-2, disturbance areas were calculated for each route as they would occur in the appropriate habitat. These disturbance areas include approximately 11.38 miles along the Lockhart to Tortilla segment, 12.1 miles along the Lockhart to Kramer segment, and 17.52 miles along the Kramer to Victor segment in the MGS Conservation Area. However, implementation of the impact avoidance and minimization measures, as listed in Appendix S, would reduce impacts to MGS. It is assumed that MGS occupy suitable habitat within the telecommunication corridors, and impacts to MGS habitat will be mitigated through acquisition of MGS habitat. For lands impacted within the MGS Conservation Area, a mitigation ratio of 5:1 would apply; for land outside of the MGS Conservation Area, a mitigation ratio of 3:1 would apply. Potential impacts to MGS and proposed mitigation are presented in Table 3.8-6.

Table 3.8-6: Impacts to MGS Habitat from Fiber-optic Lines and Proposed Mitigation

Route	Feature	Impact (acres)	Mitigation Ratio (acres)	Total (acres)
Lockhart to Tortilla	Access road (5 miles long)	4.85	5:1	24.25
	13 Pull sites	1.43	5:1	7.15
Total Lockhart to Tortilla		*6.28*		*31.4*
Lockhart to Kramer	13 Pull sites	1.43	5:1	7.15
Total Lockhart to Kramer		*1.43*		*7.15*
Kramer to Victor	New interset poles (30 poles)	7.75	5:1	38.75
	Installation of hardware (92 poles)	0.59	5:1	2.95
	Installation of hardware (23 poles)	0.15	3:1	0.45
	Pull sites (10)	1.1	5:1	5.5
	Pull sites (3)	0.33	3:1	0.99
Total Kramer to Victor		*9.92*		*48.64*
Grand Total		**17.63**		**87.19**

Nonlisted, Special-status Wildlife Species. Direct impacts to WBO and other nonlisted special-status wildlife species during construction could result from crushing of occupied burrows and destruction of nests; collisions with construction and maintenance vehicles; and taking of breeding, foraging, and wintering habitat as a result of fiber-optic line installation. Implementation of the impact avoidance, minimization, and compensation measures would reduce impacts to WBO and other nonlisted, special-status wildlife species. Based on the timing of the SPS implementation, the measures listed in Appendix S would be implemented to avoid, reduce and mitigate impacts.

If American badger or kit fox dens are discovered during DT or WBO preconstruction surveys, avoidance and minimization measures will be implemented as described in Appendix S to ensure that there is no adverse impact to the species.

3.8.4.2 No-Action Alternative

Under the No-Action Alternative, DOE would not issue Mojave Solar a loan guarantee for construction of the proposed Project, BLM would not issue ROW grants for the fiber-optic telecommunications lines, and Mojave Solar would not proceed with the proposed Project. Absent the proposed Project, current land uses would continue at the AMSP/Lockhart Substation site, and along the proposed fiber-optic telecommunication corridors. There would be no additional loss of vegetation, wildlife, or potential habitat for special-status species that might be present in the vicinity of the proposed Project, and none of the proposed environmental protection and compensation measures would be implemented. The environmental benefits associated with renewable energy also would not occur.

3.9 Cultural Resources

A pedestrian field survey, records and literature search and a limited subsurface testing program were conducted to identify cultural resources in the proposed Project area and evaluate National Register of Historic Places (NRHP) eligibility of identified resources within a defined area of potential effects (APE). These efforts are reported in the *Cultural Resources Class III Survey Report for the Proposed Mojave Solar Project and Lockhart Substation Connection & Communication Facilities, San Bernardino County, California* (Wilson et al. 2010), which is included as confidential Appendix N. This section summarizes the findings of these analyses.

3.9.1 Regulatory Framework

The project Applicant has applied for federal funding through a DOE loan guarantee and portions of the project are located on lands managed by the BLM. As such, the project is considered a federal undertaking subject to Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended ([16 U.S.C. 470 et seq., 36 CFR Part 800]). Section 106 requires federal agencies to consider the effects of their undertakings on historic properties and consult with the State Historic Preservation Officer. DOE is the lead agency for Section 106 compliance. However, BLM, as a cooperating agency in accordance with a Memorandum of Understanding between DOE and BLM, signed January 2010, has agreed to provide oversight and support for the cultural resources work associated with the proposed Project. Therefore, DOE has deferred lead authority to BLM solely for activities pertaining to historic resources review to comply with Section 106. DOE has initiated consultation with Native Americans and other interested parties (NHPA and implementing regulations [16 U.S.C. 470 et seq., 36 CFR Part 800]). These efforts are summarized in Section 3.9.2.3.

Federal regulations applicable to these cultural resources investigations include the NHPA and implementation regulations (16 U.S.C. 470 et seq., 36 CFR Part 800); the Archaeological Resources Protection Act, as amended (16 U.S.C. 470aa et seq.); Protection and Enhancement of the Cultural Environment (EO 11593); Indian Sacred Sites (EO 13007); Consultation and Coordination with Indian Tribal Governments (EO 13084); and the Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001).

Identified cultural resources within the APE were assessed for eligibility for inclusion in the NRHP and recommendations were provided to BLM as part of the Class III survey report (Wilson et al. 2010). To be eligible to the NRHP, a resource must be significant at the local, state, or national level under one or more of the following four criteria. Eligible resources are those that:

A. are associated with events that have made a significant contribution to the broad patterns of our history;

B. are associated with the lives of persons significant in our past;

C. embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; and/or

D. have yielded, or may be likely to yield, information important in prehistory or history.

To qualify for the NRHP, resources must retain integrity. As defined by the Advisory Council on Historic Preservation, integrity is the ability of a property to convey its significance through physical features and context, including location, design, setting, materials, workmanship, feeling, and association (Advisory Council on Historic Preservation 2009).

Resources eligible for the NRHP are considered historic properties. Under Section 106 of the NHPA, actions that alter any of the characteristics that qualify a property for eligibility to the NRHP “in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association” (36 CFR § 800.5[a]) constitute an adverse effect to the historic property.

3.9.1.1 Categories of Cultural Resources

Cultural resources are nonrenewable and include buildings, structures, objects, districts, sites, or areas of traditional use with historical, architectural, archaeological, cultural, or scientific importance. Cultural resources can be generally divided into archaeological resources, architectural resources, and traditional cultural properties.

Archaeological Resources

Archaeological resources include prehistoric and historic locations or sites where human actions have resulted in detectable changes to the area. This can include changes in the soil, as well as the presence of physical cultural remains. Archaeological resources can have a surface component, a subsurface component, or both.

Historic archaeological resources are those post-dating European contact. These resources may include subsurface features such as wells, cisterns, and privies, as well as building foundations and remnants of structures.

Architectural Resources

Architectural resources are elements of the environment constructed by humans. Included are standing buildings, dams, bridges, and other residential, commercial, and industrial structures.

Traditional Cultural Properties

Traditional cultural properties are resources associated with beliefs and cultural practices of a living culture, subculture, or community. These beliefs and practices must be rooted in the group's history and be important in maintaining the cultural identity of the group. Archaeological sites; locations of events; sacred places; and resource areas, including hunting or gathering areas, may be traditional cultural properties.

3.9.2 Study Methodology

Analyses completed for the proposed Project included background research at the San Bernardino Archaeological Information Center (SBAIC) at the San Bernardino County Museum, field surveys to determine the presence of previously unknown resources located within the APE, and evaluation of the significance of cultural resources that could be affected by the proposed Project.

3.9.2.1 Definition of the Area of Potential Effects

The APE for the proposed Project has been defined based on both direct and indirect impacts. The APE for the AMSP/Lockhart Substation site consists of 1,765 acres and includes the AMSP and Lockhart Substation sites, incorporating the interconnection to the SCE transmission lines adjacent and south of the site. The cultural resources APE for the proposed fiber-optic telecommunication system consists of approximately 85 linear miles surveyed in a 300-foot-wide corridor, with the exception of where the survey was truncated due to existing roads, parallel transmission lines, or private property boundaries. These truncations are as follows: (1) where the APE runs between the Victor and Kramer substations and there is a well-established access through-road, the APE is 200 feet wide; (2) where the proposed fiber-optic route follows directly alongside an existing paved road and the existing transmission line is located in the shoulder of the road, the APE is 200 feet wide; (3) where the proposed fiber-optic route parallels a paved road, the APE was terminated at the road shoulder.

The proposed Project APE, therefore, refers to the AMSP/Lockhart Substation project site and the proposed fiber-optic telecommunication system linear corridor. An additional 200-foot buffer around the AMSP/Lockhart Substation site was required by the CEC (0.5 mile for architectural resources) and was surveyed and reported on (Wilson et al. 2010) but is not included in the proposed Project APE as defined in the present study.

3.9.2.2 Archival Research

A detailed records search of an area encompassing the AMSP/Lockhart Substation site APE and a 1-mile radius was performed at the SBAIC in 2006. In 2009, AECOM requested an updated records search for the AMSP/Lockhart Substation site APE and a 1-mile radius. The SBAIC responded that no new records or reports for the records search area had been received since the 2006 records search. Supplemental records searches encompassing the proposed fiber-optic telecommunication system APE and a 1-mile radius were conducted at the SBAIC by AECOM employees in 2010. The results of all records searches are combined in this discussion. The records searches included a review of archaeological, historical, and environmental literature, as well as the archaeological site records and survey maps on file at the SBAIC. A background literature review of the NRHP, California Register of Historical Resources, and any local listings maintained by the SBAIC were also undertaken.

In addition to the records search conducted at the SBAIC, a file search was conducted at Edwards Air Force Base (EAFB or Base) for the portion of the fiber-optic route APE within the base boundary (i.e., along the Kramer to Victor Substation route). The file search consisted of a review of the site records and reports on file at the base.

Background research also included a review of historical maps, literature, and collections pertaining to the region. In addition, the Native American Heritage Commission, local tribal representatives, and local historical societies were contacted regarding information and concerns about cultural resources in the area.

Previous Investigations

The SBAIC records searches identified 201 previous studies within the proposed Project records search area: four are within the AMSP/Lockhart Substation records search area, 186 are in the telecommunication system records search area, and 11 are located within both the AMSP/Lockhart Substation and telecommunication system records search areas. Of the 201 studies, seven investigated some portion of the AMSP/Lockhart Substation APE for a comprehensive survey of the entire AMSP/Lockhart Substation area and 93 investigated some portion of the telecommunication system APE. Goodman (1988), Swanson (1988), Hampson (1988 and 1990), Hampson and Swanson (1989), and Hampson and Skinner (1990) consist of cultural resources assessments for a proposed solar plant with survey boundaries that encompass the AMSP/Lockhart Substation area. These studies comprehensively covered the AMSP/Lockhart Substation APE and documented the majority of previously recorded cultural resources identified in the current AMSP/Lockhart Substation survey area and CEC required buffers. Of the studies that have investigated some portion of the telecommunication system area, two have investigated the Victor–Kramer 115-kV transmission line (proposed Kramer to Victor Substation fiber-optic line), specifically Hampson 1989 and Taylor 1989. The existing transmission lines for the telecommunication system between Kramer and Lockhart substations and Lockhart and Tortilla substations have not been specifically investigated.

Previous Recorded Cultural Resources

The SBAIC records searches identified 285 previously recorded cultural resources within the proposed Project records search area: 13 are within the AMSP/Lockhart Substation records search area, 255 are in the telecommunication system records search area, and 17 are located within both the AMSP/Lockhart Substation and telecommunication system records search areas. Of the 285 previously recorded cultural resources that were identified, 125 are historic, 133 are prehistoric, 10 are multicomponent sites, 16 are farming or residential structures or complexes, and one site consists of three rock rings of unknown age. In addition to the previously recorded sites, 394 isolated archaeological finds were identified within the AMSP/Lockhart Substation and telecommunication system records search areas. Of these, 259 are prehistoric, 134 are historic, and one is multi-component.

A total of 44 previously recorded resources are within the proposed Project APE. Of these, 15 have had determinations of NRHP eligibility. One resource (CA-SBR-6793H) has been determined as eligible for listing in the NRHP, one (P-36-4020H) has been listed as received but an evaluation by the Keeper of the Register has not yet been made, and three linear resources (CA-SBR-2910, CA-SBR-6693, and CA-SBR-10316) have both eligible and ineligible determinations on various segments and are being assumed eligible for the purposes of this proposed Project. The remaining 10 resources have been determined not eligible.

3.9.2.3 Tribal Consultation

DOE has initiated consultation with Native Americans, consulting parties, and interested parties (NHPA and implementing regulations [16 U.S.C. 470 et seq., 36 CFR Part 800]). BLM has agreed to be a cooperating agency in accordance with a Memorandum of Understanding between the DOE and BLM, signed January 2010. Although DOE is the overall lead for the Proposed Action, BLM agreed to act on their behalf for the cultural resources review due to BLM’s specialized expertise.

Letters were sent by DOE to local Federally Recognized Native American tribes on September 27, 2010, formally inviting them to participate in government-to-government consultation regarding the Abengoa Mojave Solar Project In February 2011, the tribes were contacted again. Follow-up letters were sent to inform them of the results from the Class III Cultural Resources Survey Report (Wilson et al. 2010).

One response has been received for the proposed Project to date. Ann Brierty from the Environmental Division of the San Manual Band of Mission Indians submitted an email on behalf of her Tribe. The Tribe’s main concern is that a Native American monitor be present during ground-disturbing activities. On November 11, 2010, Jim Shearer from BLM attended a meeting held in Newberry Springs at the request of Ann Brierty. Ms. Brierty was updated on the proposed Project, at which time she had reiterated her request that tribal monitors be present during ground disturbing activities on the project.

Copies of correspondence with Native American groups and individuals are provided in Appendix R. Table 3.9-1 shows the results of Native American consultation for the proposed Project to date.

Table 3.9-1: Native American Contacts by Affiliation

Name/Title	Affiliation	Dates of Contact	Response
Charles Wood, Chairperson	Chemehuevi Reservation	09/27/10 02/08/11	Initial letter sent. Follow-up letter sent. No response to date.
June Leivas, Cultural Lead	Chemehuevi Reservation	09/27/10 02/08/11	Initial letter sent. Follow-up letter sent. No response to date.
Mike Contreras	Morongo Band of Mission Indians, Cultural Heritage Program	09/27/10 02/08/11	Initial letter sent. Follow-up letter sent. No response to date.
Robert Martin, Chairman	Morongo Band of Mission Indians	09/27/10 02/08/11	Initial letter sent. Follow-up letter sent. No response to date.
Ann Brierty	San Manual Band of Mission Indians, Environmental Division	09/27/10 10/13/10 11/11/10 02/14/11	Initial letter sent. Ms. Brierty requested that a Native American monitor be present during ground-disturbing activities. BLM met with Ms. Brierty in person. She reiterated request for Native American monitor during ground-disturbing activities. Follow-up letter sent.
James Ramos, Chairman	San Manual Band of Mission Indians	09/27/10 02/08/11	Initial letter sent. Follow-up letter sent. No response to date.
Darrell Mike, Chairperson	Twenty-Nine Palms Band of Mission Indians	09/27/10 02/08/11	Initial letter sent. Follow-up letter sent. No response to date.
Anthony Madrigal, Cultural Lead	Twenty-Nine Palms Band of Mission Indians	09/27/10 02/08/11	Initial letter sent. Follow-up letter sent. No response to date.
Daniel Eddy, Chairman	Colorado River Indian Tribe	09/27/10 02/08/11	Initial letter sent. Follow-up letter sent. No response to date.
Ralph Bear, President	Fort McDowell Yavapai Nation	09/27/10 02/08/11	Initial letter sent. Follow-up letter sent. No response to date.
Timothy Williams, Chairman	Fort Mojave Indian Tribe	09/27/10 02/08/11	Initial letter sent. Follow-up letter sent. No response to date.
Ona Segundo, Chairperson	Kaiband Band of Paiute Indians	09/27/10 02/08/11	Initial letter sent. Follow-up letter sent. No response to date.
Alfreda Mitre, Chairperson	Las Vegas Tribe of Paiute Indians	09/27/10 02/08/11	Initial letter sent. Follow-up letter sent. No response to date.
Darren Daboda, Chairman	Moapa Band of Paiute Indians	09/27/10 02/08/11	Initial letter sent. Follow-up letter sent. No response to date.

Name/Title	Affiliation	Dates of Contact	Response
Lora Tom, Chairperson	Paiute Indian Tribe of Utah	09/27/10 02/08/11	Initial letter sent. Follow-up letter sent. No response to date.
Jamie Fullmer, Chairman	Yavapai-Apache Nation	09/27/10 02/08/11	Initial letter sent. Follow-up letter sent. No response to date.

3.9.3 Affected Environment

3.9.3.1 Prehistory

Prehistoric human settlement patterns in the Mojave Desert have been influenced by environmental change. Major climatic periods influenced prehistoric spatial settlement patterns and resource exploitation. The terminal Pleistocene conditions in the Mojave Desert were relatively cool and wet, and, although variable, the early Holocene remained generally cooler and moister than today. The middle Holocene saw a much warmer and drier climate than that of modern times, and the climate became moderately cooler and wetter during the late Holocene, with punctuated periods of drought (Sutton et al. 2007).

Lake Mojave (circa 12,000–7000 B.P.)

The Lake Mojave period is considered to be one of extreme environmental change, where the relatively cool and moist conditions of the terminal Wisconsin geological period changed to the drier and warmer climate of the Holocene. The artifact assemblages considered typical of the period include fluted points, leaf-shaped points, and long-stemmed narrow-shouldered points of the Lake Mojave series, as well as crescents, abundant bifaces, and various large well-made scrapers and other flake tools. York (1995) states that the use of obsidian is relatively common, with the majority of the material derived from the Coso source. Basgall and Hall (1992) also indicate that there is an apparent preference for using cryptocrystalline silicate for flake tools and basalt for bifaces at Fort Irwin, and Apple and York (1993) found the same phenomena at Silver Lake. Milling equipment is rarely found at Lake Mojave sites.

From the available evidence, it appears that Lake Mojave period groups had settlement patterns focused on pluvial lake shorelines (Hester 1973; Warren 1991; Willig 1988; York 1995). Tool assemblages are consistent with a subsistence system based on hunting, particularly of large game (Cleland and Spaulding 1992; Kelly and Todd 1988; Warren 1986), but not exclusive of smaller mammals and reptiles (Basgall 1990; Simms 1988; Warren 1990; Willig and Aikens 1988; York 1995).

Pinto Period (circa 7000–4000 B.P.)

Climatic change to increasingly arid conditions occurred during the middle Holocene. Warren (1984) sees this as the beginning of cultural adaption to extreme desert conditions. There is an ongoing debate on whether the central Mojave was abandoned at this time (Donnan 1964; Kowta 1969; Wallace 1962) or whether occupation continued (Jenkins 1987; Jenkins and Warren 1984; Susia 1964; Sutton 1996; Tuohy 1974; Warren 1984) but with changes in population density, subsistence practices, and technology (Warren 1986). The artifact assemblages associated with this period include Pinto points; heavy-keeled scrapers; choppers; small, flat milling stones; and manos (Warren 1986). Warren (1986) postulates that the Pinto culture evolved from the hunting complex of the Late Mojave period, representing "a small population dependent upon hunting and gathering, but lacking a well-developed milling technology." He also suggests that the population moved to the desert margins and oasis sites such as water holes, springs, and streams where the occupations tended to be temporary and seasonal.

Gypsum Period (circa 4000–1500 B.P.)

The Gypsum period corresponds to the onset of late Holocene neoglacial cooling, sometimes referred to as the Little Pluvial. In the Mojave, this was a time of increased effective moisture and was marked by a significant increase in the occupation of the area, especially near streams (Elston 1982; Sutton 1996). The artifact assemblage diversified, including several projectile point types (Elko Eared and Corner-notched, Gypsum Cave, and Humboldt Concave Base), increased use of manos and metates, and the introduction of new technologies such as the mortar and pestle and the bow and arrow. In addition, evidence of contact with other cultural areas, such as the California coast, is indicated by *Haliotis* and *Olivella* shell beads (Warren 1986). Warren (1984) also suggests that mesquite processing was first exploited during this period and that the greater productivity of this period, coupled with the refinement of hunting and seed processing technologies, increased the ability of the region to support increased population growth (Warren 1986).

Saratoga Springs Period (circa 1500–750 B.P.)

The Saratoga Springs period is one of strong regional developments according to Warren (1986), including the Northwestern Mojave, the Eastern Mojave, and the Southern Mojave. The artifactual assemblage is characterized by Eastgate and Rose Spring projectile points in the northwestern and northeastern areas, while to the south along the tributaries of the Colorado River, Anasazi influence is seen in Cottonwood and Desert side-notched projectile points and the introduction of paddle-and-anvil brown and buff ceramics (Lyneis 1989). Subsistence appears to rely more heavily on small fauna such as rabbit and tortoise and less on deer (Warren 1986). There is an intensified use of vegetal resources, as evidenced by the high frequencies of ground and battered stone. In addition, the milling assemblages contain larger numbers of nonportable, expedient milling slabs and utilized handstones (Basgall and Hall 1992).

Late Prehistoric Period (circa 750–200 B.P.)

It has been suggested that Numic-speaking Paiute and Shoshone groups entered and occupied the area at this time (Bettinger and Baumhoff 1982; Fowler 1972; Miller 1986; Warren and Crabtree 1986) based on a widely distributed artifact assemblage that included Desert side-notched points and brownware ceramics, as well as linguistic evidence.

Ethnographic Background

Ethnographic evidence suggests that the Vanyume, a subgroup of the Serrano Indians (Hopa 1980; Macko et al. 1993a) were the primary occupants of the proposed Project region; however, the Serrano occupied the region to the south of the Vanyume, covering a small portion of the proposed Kramer-Victor telecommunication system study area near the Victor Substation.

The generic term "Serran" has been applied to four groups of the Takic branch of the Uto-Aztecan stock (Shipley 1978:88). These groups include the Aliklik or Tataviam, Kitanemuk, Vanyume, and Serrano (Kroeber 1925:611). The word "Serrano" means "mountaineer" or "those of the Sierras," and is used here to discuss the ethnic group who lived in the San Bernardino Mountains. The San Bernardino Mountains, including the foot of Mount San Jacinto, the southern edge of Gorgonio Pass, Twentynine Palms northeast of Big Morongo Creek, and along the Mojave River, were among the documented areas of settlement for the Serrano (Johnston 1980; Kroeber 1925:618).

The Vanyume were a desert-dwelling subgroup of the Serrano who lived primarily along the Mojave River. Whether the Vanyume spoke a dialect of Serrano or a separate Takic language cannot be determined from the brief word list available (Bean and Smith 1978). In fact, little is known about the Vanyume except as a recognized subgroup of the Serrano. It is known that the two groups diverged politically: The Vanyume had good relations with the Chemehuevi and the Mojave, their neighbors to the east, and the mountain-dwelling Serrano did not. Father Francisco Garcés traveling up the Mojave River reported on the Vanyume, calling them the Beñeme, the name he also used for the Serrano. Garcés described the groups along the Mojave River as a poor population inhabiting only a few sparse settlements (Kroeber 1925:615).

In addition to the Vanyume and Serrano, this portion of the Mojave Desert was visited by members of several native groups. Sutton et al. (2007) indicate the proposed Project area to be marginal to the Kitanemuk and the Desert Kawaiisu. Additionally, as Earle (2003) discusses in his study of native use and occupation of the Fort Irwin area, the Central Mojave Desert has been reportedly exploited by people from a number of groups, including the Chemehuevi/Southern Paiute, Mohave, and perhaps the Desert Kawaiisu.

Regional History

A discussion regarding the regional history of the project study area is provided in the Class III Cultural Resources Study (Confidential Appendix N), on file with DOE. The regional history details the history of this portion of the Mojave Desert, beginning in the 1770s and continuing to present day.

3.9.4 Environmental Consequences

Pedestrian archaeological and historic architecture field surveys were undertaken for the AMSP/Lockhart Substation APE in 2009 and for the telecommunication system APE in 2010.

The archaeological surveys identified 112 archaeological sites and 165 isolates within the proposed Project APE and CEC buffer. Of the 112 identified archaeological sites within the survey area, 92 are historic, 12 are prehistoric, and eight are multi-component. Twenty-five sites were found in the AMSP/Lockhart Substation survey area (six in the AMSP/Lockhart Substation site APE and 19 in the CEC buffer), 85 were found within the telecommunication system APE, one was in both the AMSP/Lockhart Substation and telecommunication system APEs, and one was in both the telecommunication system APE and the CEC buffer. Thirty-eight isolates were found in the AMSP/Lockhart Substation survey area (24 within the AMSP/Lockhart Substation site APE and 14 within the CEC buffer), 125 within the telecommunication system APE, one within both the AMSP/Lockhart Substation and telecommunication system APEs, and one within both the telecommunication system APE and CEC buffer. Table 3.9-2 summarizes the findings, resource eligibility recommendations, and potential proposed Project effects of the 93 archaeological sites within the proposed Project APE. These data are presented in detail in the Cultural Resources Class III Survey Report (confidential Appendix N). Eligibility recommendations were developed in consultation with BLM Barstow Field Office Archaeologist Jim Shearer during a site visit and document review on November 2, 2010.

Table 3.9-2: Summary of Potential Effects to Identified Archaeological Sites in the Project APE

Site	Age	Description	NRHP Eligibility Recommendation	Potential Effects
P-36-2257 (CA-SBR-2257/H)	Prehistoric and early to late 20th century	Lithic quarry and scatter, prehistoric habitation, and refuse disposal scatter	Portion within APE is not eligible	No effect
P-36-2291 (CA-SBR-2291/H)	Prehistoric and early to late 20th century	Lithic scatter and refuse disposal scatter	Portion within APE is not eligible	No effect
P-36-2910 (CA-SBR-2910H)	Early to mid-20th century	National Old Trails Highway and early route for U.S. Route 66	Eligible	No adverse effect
P-36-4018H (CA-SBR-4018H)	Early 20th century	Refuse disposal scatter	Not eligible	No effect

Site	Age	Description	NRHP Eligibility Recommendation	Potential Effects
P-36-4019H (CA-SBR-4019H)	Early 20th century	Refuse disposal scatter	Not eligible	No effect
P-36-4020H (CA-SBR-4020H)	Early to mid-20th century	Refuse disposal scatter and possible historic homestead	Not eligible	No effect
P-36-4021 (CA-SBR-4021H)	Early 20th century	Refuse disposal scatter	Not eligible	No effect
P-36-4022 (CA-SBR-4022/H)	Prehistoric and Early to mid-20th century	Lithic scatter and refuse disposal scatter	Not eligible	No effect
P-36-6148 (CA-SBR-6148H)	Early to mid-20th century	Refuse disposal scatter	Not eligible	No effect
P-36-6572 (CA-SBR-6572H)	Early to late 20th century	Refuse disposal dump	Not eligible	No effect
P-36-6693 (CA-SBR-6693H)	Late 19th century, Early to mid-20th century	Atchison, Topeka and Santa Fe Mojave railroad	Eligible	No adverse effect
P-36-6793H (CA-SBR-6793)	Late 19th century, Early to mid-20th century	Atchison, Topeka and Santa Fe Mojave railroad alignment	Eligible	No adverse effect
P-36-7429 (CA-SBR-7429H)	Early to mid-20th century	Refuse disposal scatter	Not eligible	No effect
P-36-7431H (CA-SBR-7431)	Late 19th to mid-20th century	Kramer–Randsburg Wagon Road	Not eligible	No effect
P-36-7432 (CA-SBR-7432)	Prehistoric	Lithic scatter	Not eligible	No effect
P-36-7544/H (CA-SBR-7544/H)	Prehistoric and Early to mid-20th century	Lithic quarry and scatter, refuse disposal scatter, and well/mine shaft	Not eligible	No effect
P-36-7545 (CA-SBR-7545H)	Early to mid-20th century	U.S. Highway 395	Portion within APE is not eligible	No effect
P-36-7746 (CA-SBR-7746H)	Mid-20th century	Refuse disposal scatter and cistern	Not eligible	No effect
P-36-7747 (CA-SBR-7747H)	Early to mid-20th century	Possible homestead site with refuse disposal scatter	Not eligible	No effect
P-36-9509 (CA-SBR-9509H)	Early to mid-20th century	Can scatter	Not eligible	No effect
P-36-10316 (CA-SBR-10316)	Early 20th century	Kramer-Victor 115-kV Transmission Line	Eligible. Portion within the APE is a non-contributing element.	No adverse effect
P-36-10317 (CA-SBR-10317H)	Early 20th century	Victor-Barstow 33-kV Transmission Line	Not eligible	No effect
P-36-10318 (CA-SBR-10318H)	Early 20th century	Telecommunication line	Not eligible	No effect
P-36-12469 (CA-SBR-12261)	Prehistoric	Lithic scatter	Not eligible	No effect

Site	Age	Description	NRHP Eligibility Recommendation	Potential Effects
P-36-12470 (CA-SRB-12262)	Prehistoric	Lithic scatter	Not eligible	No effect
P-36-12690 (CA-SBR-12364)	Prehistoric	Lithic scatter	Not eligible	No effect
P-36-13897 (CA-SBR-12713H)	Early to mid-20th century	Refuse disposal scatter	Not eligible	No effect
P-36-13952 (CA-SBR-12741H)	Early to mid-20th century	Historic well and water conveyance system and refuse disposal scatter	Not eligible	No effect
P-36-13954 (CA-SBR-12743H)	Early to late 20th century	Refuse disposal dump	Not eligible	No effect.
P-36-13959 (CA-SBR-12748H)	Early to mid-20th century	Historic dirt road	Portion within APE is not eligible	No effect
P-36-20994 (CA-SBR-13526H)	Mid- to late 20th century	Reservoir and attendant facility structures, refuse disposal scatter	Not eligible	No effect
P-36-20996 (CA-SBR-13528H)	Mid-20th century	Refuse disposal scatter	Not eligible	No effect
P-36-21001 (CA-SBR-13533H)	Mid-20th century	Refuse disposal scatter	Not eligible	No effect
P-36-21005 (CA-SBR-13537H)	Mid-20th century	Refuse disposal dump and possible homestead site	Not Eligible	No effect
P-36-21006 (CA-SBR-13538)	Prehistoric	Lithic scatter	Not Eligible	No effect
P-36-21007 (CA-SBR-13539H)	Mid-20th century	Refuse disposal scatter	Not Eligible	No effect
P-36-21096 (CA-SBR-13620H)	Mid-20th century	Refuse disposal dump	Portion within APE is not eligible	No effect
P-36-21099	Early to mid-20th century	Portion of historic SR-58/U.S. Route 466 and refuse disposal scatter/roadside litter	Not eligible	No effect
P-36-61222	Early 20th century	Can scatter	Not eligible	No effect
P-36-61225	Early to mid-20th century	Can scatter	Not eligible	No effect
P-36-61226	Early 20th century	Can scatter	Not eligible	No effect
P-36-61227	Early to mid-20th century	Can scatter	Not eligible	No effect
P-36-61253	Early to mid-20th century	Refuse disposal scatter	Not eligible	No effect
P-36-61255	Early 20th century	Refuse disposal scatter	Not eligible	No effect
P-36-61257/P-36-61256	Early to mid-20th century	Refuse disposal scatter	Not eligible	No effect
P-36-61720	Early to mid-20th century	Can scatter	Not eligible	No effect
P-36-61723	Early to mid-20th century	Refuse disposal scatter	Not eligible	No effect

Site	Age	Description	NRHP Eligibility Recommendation	Potential Effects
P-36-62025	Early to mid-20th century	Refuse disposal scatter	Not eligible	No effect
P-36-62028	Early to mid-20th century	Can scatter	Not eligible	No effect
MTL-H-FH-01	Early to mid-20th century	Refuse disposal scatter	Not eligible	No effect
MTL-P-FH-05	Prehistoric	Lithic scatter and possible temporary habitation site	Not eligible	No effect
MTL-H-NC-03	Early to mid-20th century	Refuse disposal scatter	Not eligible	No effect
MTL-H-NC-10	Early to mid-20th century	Refuse disposal scatter	Not eligible	No effect
MTL-H-NC-12	Early 20th century	Can scatter	Not eligible	No effect
MTL-H-NC-13	Early to mid-20th century	Refuse disposal dump	Not eligible	No effect
MTL-H-NC-17	Early to mid-20th century	Can scatter	Not eligible	No effect
MTL-P-NC-18	Prehistoric	Lithic scatter	Not eligible	No effect
MTL-H-NC-24	Early to mid-20th century	Glass scatter	Not eligible	No effect
MTL-H-NC-25	Early to mid-20th century	Glass scatter and cemented tin can feature	Not eligible	No effect
MTL-H-NC-30	Early to mid-20th century	Refuse disposal scatter	Not eligible	No effect
MTL-H -NC-40	Mid-20th century	Refuse disposal scatter	Not eligible	No effect
MTL-H-NC-44	Early to mid-20th century	Refuse disposal scatter	Not eligible	No effect
MTL-H-NC-45	Mid-20th century	Refuse disposal scatter	Not eligible	No effect
MTL-P-SJ-02	Prehistoric	Single lithic reduction	Not eligible	No effect
MTL-H-SJ-03	Early to mid-20th century	Refuse disposal scatter	Not eligible	No effect
MTL-H-SJ-04	Early to mid-20th century	Refuse disposal scatter	Not eligible	No effect
MTL-H-SJ-05	Mid- to late 20th century	Refuse disposal scatter	Not eligible	No effect
MTL-H-SJ-06	Early to mid-20th century	Refuse disposal scatter	Not eligible	No effect
MTL-H-SJ-08	Mid-20th century	Concrete foundations	Not eligible	No effect
MTL-M-SJ-10	Prehistoric and early to mid-20th century	Refuse disposal dump and lithic scatter	Not eligible	No effect
MTL-H-SJ-13	Early to mid-20th century	Refuse disposal scatter	Not eligible	No effect

Site	Age	Description	NRHP Eligibility Recommendation	Potential Effects
MTL-M-SJ-14	Prehistoric and early to mid-20th century	Refuse disposal dump and prehistoric isolate	Not eligible	No effect
MTL-H-SJ-15	Early to mid-20th century	Possible homestead site and refuse disposal scatter	Not eligible	No effect
MTL-H-SJ-19	Mid- to late 20th century	Refuse disposal scatter	Not eligible	No effect
MTL-H-SJ-23	Early to mid-20th century	Refuse disposal dump	Not eligible	No effect
MTL-H-SJ-24	Mid-20th century	Possible stock watering area and refuse disposal scatter	Not eligible	No effect
MTL-H-SJ-34	Mid-20th century	Refuse disposal scatter	Not eligible	No effect
MTL-H-SJ-36	Early to mid-20th century	Refuse disposal scatter	Not eligible	No effect
MTL-H-SJ-45	Mid-20th century	Possible homestead site and refuse disposal scatter	Not eligible	No effect
MTL-M-SW-01	Prehistoric and mid-20th century	Lithic scatter, and refuse disposal dump	Not eligible	No effect
MTL-H-TC-01	Early to mid-20th century	Possible homestead site and refuse disposal scatter	Not eligible	No effect.
MTL-H-TC-02	Mid-20th century	Refuse disposal scatter	Not eligible	No effect
MTL-H-TC-03	Early to mid-20th century	Refuse disposal dump	Not eligible	No effect
MTL-H-TC-09	Early 20th century	Refuse disposal scatter	Not eligible	No effect
MTL-H-TC-10	Early to late 20th century	Refuse disposal scatter	Not eligible	No effect
MTL-P-TC-15	Prehistoric	Lithic scatter	Not eligible	No effect
MTL-P-TC-16	Prehistoric	Lithic scatter	Not eligible	No effect
MTL-P-TC-18	Prehistoric	Lithic scatter	Not eligible	No effect
MTL-H-TC-20	Early to mid-20th century	Refuse disposal scatter	Not eligible	No effect
MTL-H-TC-30	Mid-20th century	Refuse disposal scatter	Not eligible	No effect
MTL-H-TC-34	Early to mid-20th century	Refuse disposal scatter	Not eligible	No effect
MTL-P-TC-37	Prehistoric	Lithic scatter	Not eligible	No effect
MTL-H-TC-39	Early to mid-20th century	Refuse disposal scatter	Not eligible	No effect

Nineteen historic architectural resources were encountered during archival research and the historic architectural field survey of the proposed Project APE and CEC buffer. Six resources are located within the AMSP/Lockhart Substation site APE (Table 3.9-3). Eight resources are located within the 0.5-mile CEC buffer survey area and an additional five resources were previously recorded within the CEC buffer survey area but no longer exist. As a result of the telecommunication system historic architecture field survey, 100 built environment resources were identified. Of these resources, 73 resources appeared over 45 years old. None of the architectural resources within the telecommunication system APE will be affected by the project activities; therefore, in consultation with BLM Barstow Field Office Archaeologist Jim Shearer during a site visit and document review on November 2, 2010, these resources were not evaluated for eligibility for the NRHP.

3.9.4.1 Proposed Action

As currently designed, the proposed Project would impact nine archaeological resources in the project APE. These effects are less than significant because they do not alter, directly or indirectly, the characteristics of the archaeological resources that would qualify them for inclusion in the NRHP in a manner that diminishes the integrity of their location, design, setting, materials, workmanship, feeling, or association.

Four previously recorded sites within the proposed Project APE have been determined eligible for the NRHP; however, the Proposed Action will have no adverse effect on these properties.

Table 3.9-3: Summary of Potential Effects to Identified Historic Architectural Resources in the Project APE

Site	Age	Description	NRHP Eligibility Recommendation	Potential Effects
P-36-006556	Early to mid-20th century	Farming and residential complex	Not eligible	No effect.
P-36-006557	Mid- to late 20th century	Farming and residential complex	Not eligible	No effect.
P-36-006558	Mid-20th century	Ranching, farming, commercial, and residential complex; Lockhart General Merchandise Store	Not eligible	No effect.
P-36-021009	Mid-20th century	Residential buildings	Not eligible	No effect.
P-36-021010	Mid-20th century	Wells/water conveyance system	Not eligible	No effect.
P-36-021011	Mid-20th century	Residential/storage building	Not eligible	No effect.

Three of the resources are two sections of the Atchison, Topeka, & Santa Fe Railroad (CA-SBR-6693 and CA-SBR-6793) and a portion of the National Old Trails Highway (CA-SBR-2910). Project impacts consist of installation of fiber-optic cable on existing transmission line structures spanning 200- to 250-foot sections of the resources. CA-SBR-6693, CA-SBR-6793, and CA-SBR-2910 are regularly maintained and are currently used by vehicle and rail traffic. No ground-disturbing or pole replacement activities will occur in the proposed Project APE at the location of these resources. Existing transmission lines, on which the fiber optic cable will be strung, cross over 200- to 250-foot sections of the resources. If final engineering results in pole replacement being necessary, poles will be replaced in-kind and all ground disturbances will be restricted to previously disturbed areas. The fourth eligible resource is CA-SBR-10316, the Southern Sierra Power Company's Control-San Bernardino Transmission line ("Tower Line"). Approximately 34 miles of the 238-mile-long resource that is within the proposed Project APE was replaced in 1989 with steel towers and is regularly maintained, compromising the historic integrity of the resource within the APE. As such, this section of CA-SBR-10316 within the proposed Project APE is not a contributing factor to the overall eligibility of the 238-mile-long resource and the Proposed Action will have no adverse effect on this property.

Two large prehistoric lithic scatters and quarries with refuse disposal scatters, CA-SBR-2257/H and CA-SBR-2291/H, have been previously determined ineligible, but it has been noted by subsequent researchers that these sites may still exhibit characteristics to be considered as eligible for the NRHP. CA-SBR-2257/H has been tested multiple times with positive subsurface results. In 1990, CA-SBR-2257/H was determined ineligible for the NRHP; however, many researchers have argued since then that the site may be potentially eligible for listing in the NRHP (Parr, Osborne, and Sutton 1990; Macko et al. 1993b; McKenna et al. 1993; York et al. 1995; Estes, Allan, and Self 2002; William Self Associates, Inc. 2002). Although the site as a whole may still be considered eligible, the portion within the proposed Project APE is within an existing transmission line ROW and is heavily disturbed by utility construction, maintenance, and access. Therefore it has lost its integrity and is not considered a contributing element to the eligibility of the site. CA-SBR-2291/H was originally recorded in 1962 and was given arbitrary boundaries that encompass an area nearly 1 square mile. Four small loci of prehistoric debitage have been identified since the 1962 recording. In 1990, CA-SBR-2291 was determined ineligible for the NRHP; however, it has been noted that subsurface testing and artifact analysis are needed before eligibility can be determined (Tang, Encarnacion, and Ballester 2007). Only two isolated prehistoric cultural artifacts were located in the proposed Project APE in the mapped location for the site; therefore, the portion within the APE is not a contributing element to the overall potential eligibility of the site.

One resource, CA-SBR-12748H, is an early to mid-20th century historic dirt road that extends northeast of SR-58 to the Santa Fe Railroad rail line, and southwest of SR-58 to the historic town of Helen. The proposed Project APE includes a 400-foot-long portion of the road. Although NRHP eligibility has not been determined for the resource, the portion of the resource within the proposed Project APE has been disturbed by off-road activity and public access from SR-58 and is within an existing transmission line ROW that is disturbed by utility construction, maintenance, and access. Therefore, the portion of the resource within the APE has lost its integrity and is not considered a contributing element to the eligibility of the resource.

One resource, CA-SBR-7545H, is the early to mid-20th century U.S. Highway 395, including a 4.15-mile-long abandoned section of the old highway. The resource crosses the APE multiple times. The APE is within an existing transmission line ROW and is disturbed by utility construction and maintenance. The existing SCE access through-road crosses over the abandoned portion of the highway multiple times. This resource is a longer linear site and other portions are unevaluated; however, the portions of the resource that cross the APE lack integrity and are, therefore, noncontributing elements to the eligibility of this resource.

One resource, CA-SBR-13620H, a refuse disposal dump with substantial density and extent of refuse, was tested for the Mojave Solar Project (Cooley et al. 2010). Excavations did not discover any subsurface cultural materials in the proposed Project APE; therefore, the portion within the APE does not contribute to the overall eligibility of the site, if it were ever determined to be eligible for listing in the NRHP.

None of the remaining archaeological sites within the proposed Project APE meet the NRHP eligibility criteria and are recommended as “not eligible” for the NRHP.

None of the historic architectural resources within the proposed Project APE meet the NRHP eligibility criteria and are recommended as “not eligible” for the NRHP.

Therefore, as currently designed, the DOE and BLM Proposed Actions would not result in any adverse effects to historic properties. However, final engineering for the telecommunication system has not been completed. Preservation and avoidance of cultural resources is the preferred treatment. Every effort will be made by SCE to avoid impacts to eligible resources during the design and implementation of the telecommunication system. If NRHP-eligible historic properties cannot be avoided through project design, adverse effects to these properties must be addressed through a Memorandum of Agreement (36 CFR 800.6) between the Advisory Council for Historic Preservation, State Historic Preservation Officer, and BLM.

To provide for avoidance of resources and adverse effects, several measures are proposed, including preparation of a Monitoring Plan prior to start of construction and all subsurface ground-disturbing activities. The Monitoring Plan will include provisions for inclusion of Native American representatives during the construction monitoring and stop-work protocols in the unanticipated event resources are discovered to allow for coordination with BLM. A Monitoring Report documenting the monitoring efforts will be prepared and submitted to BLM when the construction is completed. Refer to Appendix S for a complete list of avoidance and impact minimization measures.

3.9.4.2 No-Action Alternative

Under the No-Action Alternative, DOE would not issue Mojave Solar a loan guarantee for construction of the AMSP, and Mojave Solar would not proceed with the proposed Project. Absent the proposed Project, current use would continue at the AMSP/Lockhart Substation, interconnection area, and along the proposed fiber-optic telecommunication corridors, and there would be no impacts to cultural resources or changes to the condition or integrity of cultural resources in the APE. Therefore, under the No-Action Alternative, no impacts would result and no mitigation would be required.

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3.10 Socioeconomics

3.10.1 Study Methodology

This section reviews and describes the socioeconomic setting of the area potentially affected by the proposed Project and discusses the potential socioeconomic impacts that would be caused by construction and operation. This section also describes the economic characteristics of the area, including population, employment and economy, housing, public services and utilities, schools, and local government and finance.

For purposes of the socioeconomic analysis, the study area is typically defined as those counties and major cities within a 2-hour drive from the proposed Project study area on mapped roads (federal, state, city, and county).[12] This includes portions of the counties of San Bernardino, Kern, and Los Angeles. To simplify the analysis by focusing on the most likely communities of residences for commuters, those cities and communities within 30 minute drive times are specifically included in the analysis, as are all cities and communities with populations over 20,000 individuals within San Bernardino County, and all cities with populations over 40,000 individuals in Los Angeles and Kern counties within a 2-hour drive time.

3.10.2 Affected Environment

The AMSP and Lockhart Substation are in a rural area, located approximately 10 miles west of the City of Barstow. Figure 3.10-1 depicts the counties defined as the study area, most of the cities relevant to this analysis, and the approximate drive times from the AMSP site. The closest community in proximity to the AMSP site is Barstow. Other communities considered to be part of the study area, due to population size and/or proximity to the AMSP/Lockhart Substation site and linear facilities, include Adelanto, Apple Valley, Hesperia, Victorville, Yucaipa, Highland, Colton, Redlands, Rialto, Fontana, San Bernardino, Lancaster, Palmdale, Pasadena, Santa Clarita, Glendale, Los Angeles, and Bakersfield.

3.10.2.1 Population

The proposed Project is located in San Bernardino County, near the boundaries of Los Angeles and Kern counties. Due to this location, socioeconomic impacts would potentially occur in all three counties. Population estimates and future population projections for the local and regional areas are summarized in Table 3.10-1.

[12] A 2-hour commute-shed is considered to be a generous “easy commuting distance” for construction workers and operations employees.

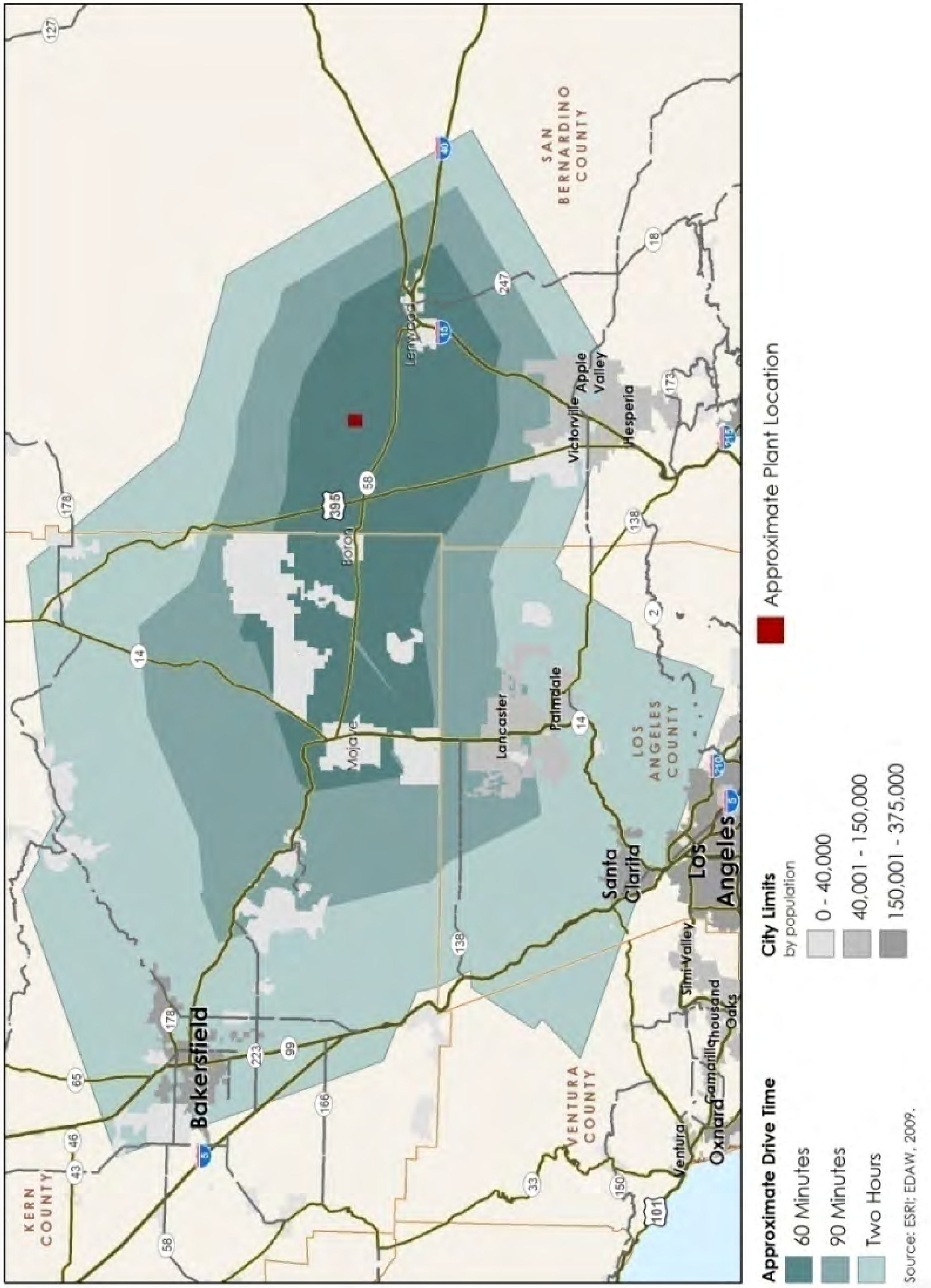

Figure 3.10-1: Socioeconomic Study Area

Table 3.10-1: Population Estimates, Projections, and Average Annual Growth Rates

County	2000	2008	Average Annual Growth (2000–2008)	2010	Average Annual Growth (2008–2010)	2020	Average Annual Growth (2010–2020)	2030	Average Annual Growth (2020–2030)
San Bernardino	1,721,942	2,055,766	2.2%	2,177,596	2.9%	2,582,777	1.6%	2,957,744	1.3%
Los Angeles	9,578,960	10,363,850	1.0%	10,514,663	0.7%	11,214,237	0.7%	11,920,289	0.6%
Kern	665,519	817,517	2.6%	871,728	3.3%	1,086,113	2.5%	1,352,627	3.4%
Study Area Counties[1]	11,966,421	13,237,133	1.3%	13,563,987	1.2%	14,883,127	0.9%	16,230,660	0.9%
California	34,105,437	38,049,462	1.4%	39,135,676	1.4%	44,135,923	1.2%	49,240,891	1.1%

[1] Sum of all counties.
Source: California DOF 2009

- San Bernardino County is the fifth most populous county in California. The population of San Bernardino County grew from 1,721,942 in 2000 to 2,055,766 in 2008, a 20% increase, according to the California Department of Finance (DOF). Population growth is expected to be 2.9% per year between 2008 and 2010, and then 1.6% per year between 2010 and 2020, and 1.3% per year between 2020 and 2030.
- Los Angeles County is the most populous county in California. The population of Los Angeles County grew from 9,578,960 in 2000 to 10,363,850 in 2008, an 8.2% increase. Annual population growth is expected to be 0.7% between 2008 and 2030 (DOF 2009).
- Kern County is the 13th most populous county in California, covering approximately 8,160 square miles. The population of Kern County grew from 665,519 in 2000 to 817,517 in 2008, a 22.8% increase. Annual population growth is expected to be 3.3% between 2008 and 2010, and then taper to 2.5% between 2010 and 2020. Kern County is projected to grow more rapidly in the future with annual growth of 3.4% between 2020 and 2030.

As shown in Table 3.10-1, between 2000 and 2008, the population of the three-county study area grew at almost the same rate as California. For the years 2008 through 2030, projected population growth for the study area counties is expected to be comparable to the state.

Table 3.10-2 shows the populations of the affected communities in 2000 and 2008, along with growth rates. The cities in San Bernardino County that experienced substantial population growth between 2000 and 2008 are Victorville (6.7%), Fontana (4.9%), Hesperia (4.3%), Apple Valley (3.3%), and Yucaipa (3.0%). The cities in Los Angeles County that experienced substantial population growth between 2000 and 2008 are Palmdale (3.0%), Lancaster (2.6%), and Santa Clarita (2.0%). Bakersfield is the only city in Kern County captured by the 2-hour driving radius; Bakersfield had 3.6% population growth from 2000–2008. Each identified community had an annual growth rate higher than the study area counties as a whole (1.3%). When combined, the study area communities exhibited an annual growth rate of 1.6%.

Table 3.10-2: Study Area Communities Population Growth

City	2000	2008	Percent Annual Change
San Bernardino County			
Apple Valley	54,239	70,092	3.3%
Barstow	21,119	23,952	1.6%
Colton	47,662	51,918	1.1%
Fontana	128,928	188,498	4.9%
Hesperia	62,590	87,820	4.3%
Highland	44,625	52,503	2.1%
Redlands	63,591	71,807	1.5%
Rialto	91,882	99,767	1.0%
San Bernardino	185,382	205,493	1.3%
Victorville	64,029	107,408	6.7%
Yucaipa	41,207	52,063	3.0%
Los Angeles County			
Glendale	194,973	207,157	0.8%
Lancaster	118,718	145,243	2.6%
Los Angeles	3,694,742	4,045,873	1.1%
Palmdale	116,670	147,897	3.0%
Pasadena	133,936	148,126	1.3%
Santa Clarita	151,131	177,045	2.0%
Kern County			
Bakersfield	246,899	328,692	3.6%
Total All Communities	*5,462,323*	*6,211,354*	*1.6%*

Source: California DOF 2009

3.10.2.2 Housing

Permanent Housing

Table 3.10-3 presents the housing resources in the three-county study area and nearby study area communities. In 2008, San Bernardino County had 483,766 single-family homes and 129,035 multi-family homes, with a vacancy rate of 11.6%. Among the cities in San Bernardino County relevant to the proposed Project, Barstow had the highest vacancy rate (17.1%), while being the smallest community with only 23,641 households.

In 2008, Los Angeles County had 1,643,878 single-family homes and 1,459,215 multi-family homes, with a vacancy rate of 4.6%. In Los Angeles County, Lancaster had a slightly higher vacancy rate than Palmdale in 2008. Kern County had 194,896 single-family households and 48,165 multi-family households, with a vacancy rate of 9.8%.

Table 3.10-3: Study Area Housing Characteristics, 2008

City	Households	Single-Family	Multi-Family	Vacancy
Kern County	817,517	194,896	48,165	9.8%
Bakersfield	324,905	84,417	27,051	5.5%
Los Angeles County	10,363,850	1,643,878	1,459,215	4.2%
Glendale	204,293	29,928	44,774	2.6%
Lancaster	137,332	34,906	10,569	8.4%
Los Angeles	3,959,760	619,158	771,063	4.6%
Palmdale	147,803	36,785	6,340	7.6%
Pasadena	144,608	30,157	27,044	4.2%
Santa Clarita	175,652	43,097	13,377	3.2%
San Bernardino County	2,055,766	483,766	129,035	11.6%
Apple Valley	69,729	20,107	3,775	8.4%
Barstow	23,641	5,905	2,970	17.1%
Colton	51,654	10,256	5,180	7.4%
Fontana	187,939	40,975	7,684	5.3%
Hesperia	87,489	24,085	3,146	6.5%
Highland	52,263	13,055	2,727	9.3%
Redlands	69,841	18,154	7,646	4.8%
Rialto	98,963	19,600	5,451	5.3%
San Bernardino	198,562	42,002	20,119	11.0%
Victorville	102,637	28,156	4,929	7.7%
Yucaipa	51,491	13,553	1,636	5.7%
Study Area Counties	*13,237,133*	*2,322,540*	*1,636,415*	*5.7%*
California	*38,049,462*	*7,713,726*	*4,171,373*	*5.9%*

Source: California DOF 2009

Temporary Housing

In addition to permanent housing, there is ample transient housing in the three counties that compose the study area. Based on information from the website Travelocity.com, there are about 1,400 hotel and motel rooms and suites among 19 different establishments in the area surrounding Barstow, with extensive additional temporary housing available in the communities within 2 hours of the proposed Project study area. Additional housing opportunities are available in the form of recreational vehicle and mobile home sites.

3.10.2.3 Employment

Employment by industry sector for San Bernardino, Los Angeles, and Kern counties for 2007 is summarized in Table 3.10-4. The largest employer in San Bernardino County is the government, which includes the local, state, and federal levels. Government jobs account for 17.9% of the total jobs in San Bernardino County. Government jobs also account for the largest percentage of jobs in Kern County, at 21.1%. In Los Angeles County, the largest industry is professional and business services, which account for 14.7% of the total job. Refer to Table 3.10-4 for other industries in the study area. In San Bernardino County, government, retail trade, and professional and business services are the leading industry groups in terms of employment. In Los Angeles County, professional and business services, government, and other services are the leading industry groups. In Kern County, government, agriculture, and retail trade are the leading industry groups.

Table 3.10-4: Employment by Industry Group – San Bernardino, Los Angeles, and Kern Counties, 2007

Industry Group	San Bernardino County		Los Angeles County		Kern County	
	Employment	Percent Total Employment	Employment	Percent Total Employment	Employment	Percent Total Employment
Agriculture	3,100	0.5%	7,500	0.2%	45,600	16.0%
Natural Resources, Mining, and Construction	43,500	6.5%	162000	3.9%	28,200	9.9%
Manufacturing	64,000	9.6%	449,200	10.9%	13,300	4.7%
Transportation, Warehousing, and Utilities	48,500	7.3%	165,600	4.0%	9,600	3.4%
Wholesale Trade	35,200	5.3%	227,000	5.5%	8,000	2.8%
Retail Trade	87,800	13.2%	426,000	10.3%	28,900	10.2%
Information	7,600	1.1%	209,800	5.1%	2,800	1.0%
Financial Activities	27,000	4.0%	246,000	6.0%	9,100	3.2%
Professional and Business Services	81,500	12.2%	605,400	14.7%	26,100	9.2%
Educational and Health Services	69,600	10.4%	490,500	11.9%	24,500	8.6%
All Other Services	79,800	12.0%	545,000	13.2%	28,200	9.9%
Government	119,100	17.9%	595,700	14.4%	60,000	21.1%
Total	**666,700**	**100.0%**	**4,129,700**	**100.0%**	**284,300**	**100.0%**

Source: California EDD 2009

According to the Economic Development Department 2009 data, the highest number of new jobs projected in San Bernardino County is expected to be in retail sales. Job growth is also anticipated for cashiers, waiters and waitresses, and material movers. In Los Angeles County, jobs in retail sales are also anticipated to be the greatest. Job growth is also anticipated for personal care aides, cashiers, and office clerks. In Kern County, farm workers and laborers have the highest number of jobs projected, followed by cashiers, retail salespersons, and elementary school teachers (refer to Table O-1 in Appendix O).

Project-Related Employment

As of 2006, there were relatively high numbers of generalized workers in San Bernardino County, including construction workers (116,810), carpenters (28,850), and construction laborers (27,930). Los Angeles County also has a relatively large number of construction workers (143,280), as well as metal workers (54,990). Kern County had 19,190 construction workers in 2006. Specialized positions were generally fewer in number for all counties in the study area, including paving, surfacing, and tamping equipment operators; power plant operators; and construction trade helpers. Tables O-2 through O-4 in Appendix O detail the skilled workers by craft required for the proposed Project for San Bernardino, Los Angeles, and Kern counties.

Employment figures for all occupations presented are anticipated to either remain constant or grow by 2016, with the exception of metal/plastic workers and machinists in Los Angeles County, which are anticipated to shrink by 5% and 0.2%, respectively, by 2016. The largest growth by occupation in San Bernardino is anticipated to be power plant operators (19.4%) and architects, surveyors, and cartographers (17.6%). In Los Angeles County, the occupations with the largest amount of anticipated growth are construction managers (13.1%) and power plant operators (12.5%). For Kern County, the two occupations with the largest amount of anticipated growth include welders, cutters, solderers, and brazers (28.8%) and architects, surveyors, and cartographers (25.0%).

Existing Unemployment Rates

The average unemployment rate between 2005 and 2007 for any county in the study area was highest in Kern County (14.8%), followed by San Bernardino (12.4%), and Los Angeles County (10.7%), as shown in Table 3.10-5.

Table 3.10-5: Employment Data in the Study Area

County/City	Civilian Labor Force	Total Employment	Number Unemployed	Unemployment Rate	Median Household Income*
San Bernardino County	882,200	773,000	109,200	12.4%	$54,093
Los Angeles County	4,978,100	4,443,700	534,400	10.7%	$52,628
Kern County	371,900	316,900	54,900	14.8%	$44,620

*2005–2007 Average
Source: California EDD 2009; U.S. Census 2008

Projected Unemployment Rates

While no California State-generated numbers exist for projected unemployment rates in San Bernardino, Los Angeles, and Kern counties, a recent report prepared for the United States Conference of Mayors regarding the role of metropolitan areas in the American Recovery and Reinvestment Act does present near-term unemployment projections for late 2009 (IHS Global Insight 2009). IHS Global Insight estimated that the nationwide unemployment rate would be approximately 10.5% in the first quarter of 2010 (IHS Global Insight 2009). Large numbers of job losses are anticipated for the Los Angeles metro area as volatility continues in the housing market. The San Bernardino area was also specifically identified as an area anticipated to experience high unemployment rates through 2010. For the Riverside-San Bernardino Metropolitan Statistical Area, the unemployment rate was 15% in March 2010, which is among the highest projections for any metropolitan area presented in the analysis.

3.10.3 Environmental Consequences

3.10.3.1 Proposed Action

Construction of the proposed Project would have local, regional, and statewide economic benefits. Mojave Solar estimates that the AMSP construction would create approximately 830 to 1,162 construction jobs, which represents between 75 and 80% of the existing labor force in the area (see Table 3.10-4). SCE estimates a total of 133 workers for the construction of the Lockhart Substation, interconnection, and fiber-optic lines. Construction of the AMSP would occur in multiple phases, with phases partially overlapping and construction of offsite elements would occur simultaneously with the substation and AMSP construction. And as a result, the full range of construction personnel would not be present for the entire duration of construction; rather, there would be a “ramping up” of construction personnel as sequential phases are initiated and a subsequent decline of construction personnel as sequential phases are completed.

Project Work Force and Population

Project construction is expected to occur over a period of approximately 26 months. Project construction, including linear facilities as well as the plant site facilities, would require an average of 830 employees per day over the entire 26-month construction period. The manpower requirements at the solar plant alone would peak at approximately 1,162 workers in Month 17 of construction. The majority of the workforce needs would be localized at the AMSP/Lockhart Substation site.

According to the Electric Power Research Institute report titled *Socioeconomic Impacts of Power Plants,* construction workers will commute as much as 2 hours to construction sites from their homes, rather than relocate (Electric Power Research Institute 1982). Refer to Tables O-2 through O-4 in Appendix O for lists of construction labor in San Bernardino County, Los Angeles County and Kern County. The proposed Project would be expected to draw from the entire construction workforce in the region, not merely those workers that are available within the immediate area.

Even at the peak of solar plant construction (1,162 workers), the availability of over 297,300 construction workers in San Bernardino, Los Angeles, and Kern counties alone would be more than sufficient to meet the proposed Project employment needs, with the proposed Project requiring approximately 0.4% of the available workforce. Therefore, project construction labor demand would not adversely affect the availability of construction labor in the region.

With the exception of some specialized trades involving a limited number of workers, it is anticipated that the project construction workforce would be drawn from the regional area (i.e., San Bernardino County, Los Angeles County, and Kern County). Therefore, project construction labor demand would not adversely affect the availability of construction labor in the region.

Employment Benefits (Direct/Indirect)

Employment wages and salaries would provide additional income to the area, as would expenditures within the three-county study area for construction materials and services. The project construction payroll has been estimated at approximately $272 million over 26 months ($125.6 million estimated annually). Capital expenditures and local spending on construction materials and equipment within the three-county study area are estimated to total approximately $121 million over 26 months ($55.8 million estimated annually).

Both indirect and indirect employment would be created in the region. Direct employment was discussed above. Indirect employment is defined as employment that will be generated by the purchase of goods and services required by project construction, or goods and services from the temporary construction workforce (food, lodging, etc.).

The construction and operation of the AMSP and Lockhart Substation would have a positive effect in employment and the local economy. Construction of the AMSP and Lockhart Substation would provide construction-type positions as well as technical positions for the installation of the solar plant components.

It is anticipated that 68 skilled permanent jobs would be created once the AMSP was operational; the substation would be an unattended facility. To appeal to the largest pool of potential local candidates, Mojave Solar would post job opportunities on the proposed Project website in English and Spanish. The substation, interconnection, and fiber-optic cables would be constructed and installed by SCE employees.

For purposes of the AMSP construction jobs, Mojave Solar adheres to a “local to global” hiring practice, which targets local communities first to fill open positions before considering regional, national, or international candidates. In order of consideration, Mojave Solar would search for qualified candidates from Barstow, Victorville and Adelanto, other small nearby communities, San Bernardino County, California, nationwide, and if necessary, internationally. This hiring strategy would greatly benefit the local population by drawing on an available labor force in areas where current unemployment rates exceed 8%.

Housing

The proposed Project would not be expected to adversely affect the housing market because there is a 17.6% vacancy rate in the area. Therefore, there is a surplus of housing to accommodate an incremental increase in short- or long-term housing needs for construction workers and permanent employees. In the long term, decommissioning would have a minor adverse impact on employment in the area due to the elimination of jobs, as noted above.

No adverse impact to employment or housing is anticipated with implementation of the proposed Project. A beneficial effect is expected.

3.10.3.2 No-Action Alternative

Under the No-Action Alternative, DOE would not issue Mojave Solar a loan guarantee for construction of the AMSP, and Mojave Solar would not proceed with the proposed Project. Absent the proposed Project, new construction jobs and full-time employment jobs would not be generated. Under the No-Action Alternative, none of the beneficial economic impacts described for the Proposed Action would occur.

3.11 Environmental Justice

According to USEPA (2009b), environmental justice is,

> The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental, and commercial operations or policies.

On February 11, 1994, President Clinton signed EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, which requires each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

EO 12898 created an Interagency Working Group on Environmental Justice composed of the heads of federal departments for the purpose of providing guidance to federal agencies on the criteria for identifying disproportionately high and adverse human health or environmental effects on minority and low-income populations. Under EO 12898, each federal agency was also charged with developing an agency-wide environmental justice strategy. In accordance with EO 12898, DOE promulgated an updated Environmental Justice Strategy that outlines four goals for developing and maintaining an integrated approach to environmental justice activities: (1) promote enforcement of all health and environmental statutes in areas with minority populations and low-income populations; (2) ensure greater public participation; (3) improve research and data collection relating to the health and environment of minority populations and low-income populations; and (4) identify differential patterns of consumption of natural resources among minority and low-income populations (DOE 2008).

As the entity tasked with oversight of the federal government's compliance with EO 12898, CEQ developed guidance to help federal agencies comply with NEPA procedures to ensure that environmental justice concerns are effectively identified and addressed (CEQ 1997). DOE NEPA guidance recommends that the agency consider *how* minority and low-income populations could be affected by a particular action before determining that there are no disproportionately high or adverse impacts on minority or low-income populations (DOE 2004).

Minority, minority population, and low-income population are defined by CEQ in *Environmental Justice, Guidance under the National Environmental Policy Act* (CEQ 1997) as follows:

Minority: An individual(s) who is a member of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic.

Minority population: Minority populations are identified where either (a) the minority population of the affected area exceeds 50%, or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. In identifying minority communities, agencies may consider as a community either a group of individuals living in geographic proximity to one another, or a geographically dispersed/transient set of individuals (such as migrant workers or Native Americans) where either type of group experiences common conditions of environmental exposure or effect. The selection of the appropriate unit of geographic analysis may be a governing body's jurisdiction, a neighborhood, Census tract, or other similar unit that is to be chosen so as not to artificially dilute or inflate the affected minority population. A minority population also exists if there is more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above-stated thresholds.

Low-income population: Low-income populations in an affected area are identified with the annual statistical poverty thresholds from the Bureau of the Census Current Population Reports on Income and Poverty. In identifying low-income populations, agencies may consider as a community either a group of individuals living in geographic proximity to one another, or a set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure or effect.

3.11.1 Study Methodology

Pursuant to the directive, USEPA issued guidelines that require all federal agencies receiving federal funds to develop strategies to address this issue. This analysis uses the federal guidelines to analyze potential environmental justice impacts. The federal guidelines include a two-step screening process to determine whether a project could result in disproportionate impacts on low-income or minority populations. The first step is to evaluate whether the potentially affected community or area includes minority and/or low-income populations. If the community contains these population groups, the second step is to determine whether adverse environmental impacts fall disproportionately on minority and/or low-income members of the community.

The study area for the environmental justice analysis was delineated by a 6-mile radius from the proposed AMSP site. No incorporated towns are adjacent to the AMSP area. The environmental justice analysis discusses the populations residing in Census tract 116, block groups 1 and 2, and Census tract 119, block group 1 (U.S. Census 2000). Due to the nature of the proposed fiber-optic lines being located on existing poles within existing transmission line corridors, this feature of the proposed Project was excluded from this analysis.

3.11.2 Affected Environment

The affected environment focuses on the area of the AMSP and Lockhart Substation. The construction and operation of the AMSP and Lockhart Substation would affect the area in the short term for the construction and the long term for the operation of the AMSP.

3.11.2.1 Demographics

Racial and ethnic data were collected from the U.S. Census Bureau Decennial Census Data for the geographic area in which the proposed AMSP would be constructed and operated, along with comparative data for San Bernardino County and the State of California (U.S. Census 2000). Table 3.11-1 lists the comparative data for the percentage of population by race/ethnicity for the Census tract, county, and state.

Table 3.11-1: Total Percentage of Population by Race/Ethnicity

Geographic Area	White	Black or African American	American Indian or Alaska Native	Asian, Native Hawaiian, or Pacific Islander	Hispanic or Latino (of any race)[1]	Some Other Race
Census Tract 116.01	85%	2%	1%	2%	15%	6%
Census Tract 116.02	85.5%	2.3%	0.8%	1.7%	14.8%	7.2%
Census Tract 119.01	78%	2%	2%	1%	25%	12%
San Bernardino County	80.3%	9.4%	1.5%	6.3%	47.5%	2.5%
State of California	76.6%	6.7%	1.2%	12.9%	36.6%	2.6%

[1] For Census 2000 there are two minimum categories for ethnicity: *Hispanic or Latino* and *Not Hispanic or Latino*. The federal government considers race and Hispanic origin to be two separate and distinct concepts. Hispanics and Latinos may be of any race (U.S. Census 2000). As a result, the percentages provided in Table 3.11-1 exceed 100%.

Source: U.S. Census 2000

Table 3.11-1 presents the minority population composition of the study area and San Bernardino County as a whole. San Bernardino County as a whole exhibits a proportion of minority residents of 56.2%, which is substantially higher than two of the Census tracts within 6 miles of the AMSP site. These Census tracts include 116.01 and 119.01, with minority proportions of 19.1 and 32.9%, respectively (this takes into account the overlap for Hispanic/Latino Census data).

Figure 3.11-1 shows the distribution of minority populations within a 6-mile radius of the AMSP. As shown, the radius encompasses all or parts of three Census tracts: 116.01, 116.02, and 119.01. The total population in the three Census tracts is 5,820, of which 1,335 are classified as Black or African-American, American Indian (or Alaska Native), Asian, Native Hawaiian (or other Pacific Islander), some other race (including two or more races), or Hispanic or Latino.

3.11.2.2 Income and Poverty Level

The 2000 Census data reported that median household income for San Bernardino County (County) was $49,217. The median household income for Census tract 119.01 is lower than the County average at $28,807. Census tract 116.01 has roughly the same average as the County. The median household income for Census tract 116.02 is the lowest in the study area at $9,318 (Table 3.11-2). The proportion of residents living below the poverty level in Census tract 116.02 is 44%, which is substantially higher than any of the other block groups within 6 miles of the AMSP, almost three times the proportion present in San Bernardino County, and four times higher than the State of California as a whole.

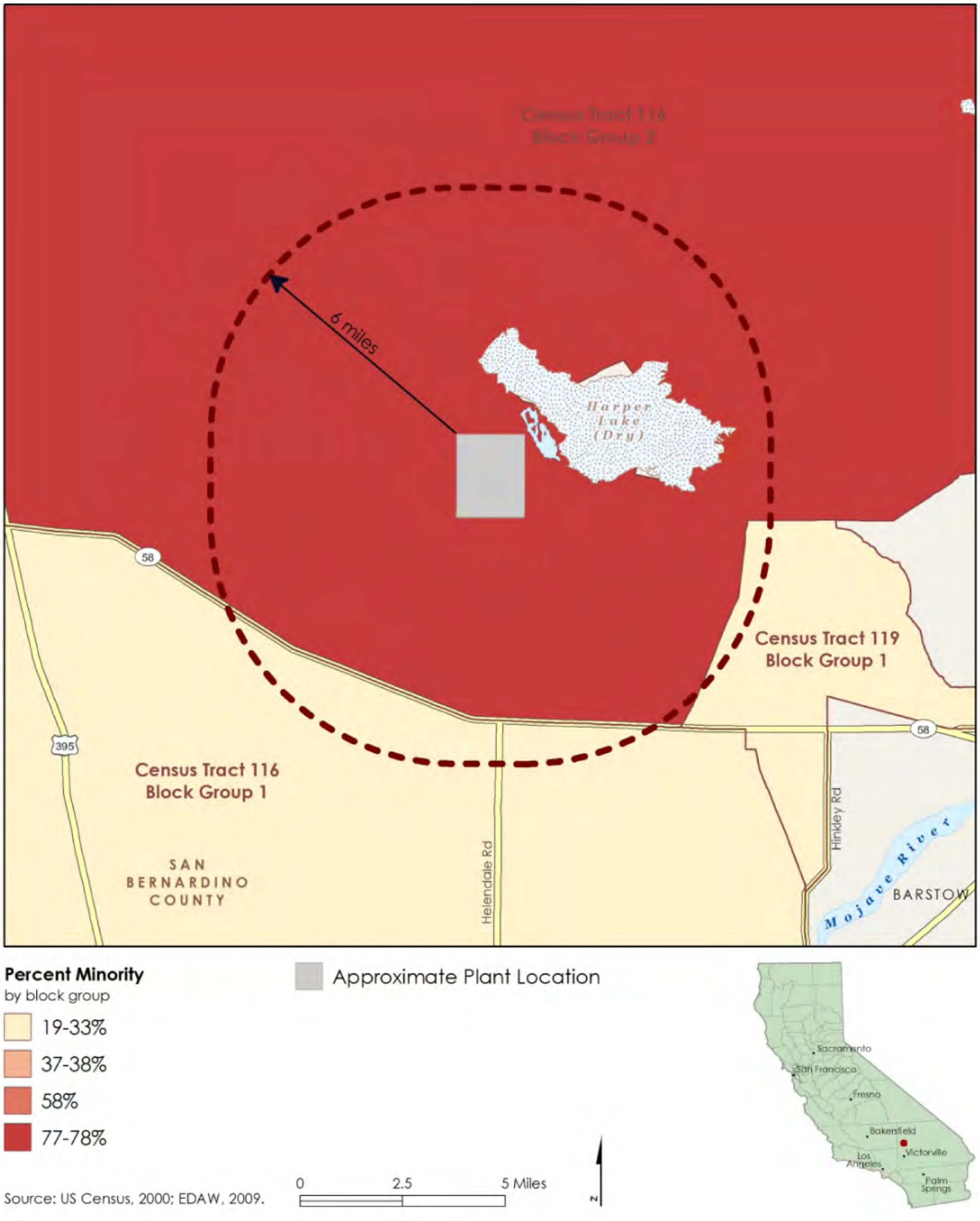

Figure 3.11-1: Percent Minority by Census Block Group

Table 3.11-2: Environmental Justice Characteristics

Geographic Area	Total Population	Total Minority (Percentage Minority)	Median Household Income (1999)	Percentage of Individuals Living Below the Poverty Level
Census Tract 116.01	4,611	883 (19.1%)	$49,046	6.9%
Census Tract 116.02	179	137 (76.5%)	$9,318	44.0%
Census Tract 119.01	1,072	353 (32.9%)	$28,807	19.4%
San Bernardino County	1,721,942	334,455 (56.2%)	$49,217	15.8%
State of California	33,871,648	13,701,589 (40.5%)	$47,493	10.6%

Source: U.S. Census 2000

3.11.3 Environmental Consequences

3.11.3.1 Proposed Action

In the context of the siting of a renewable energy power plant, the primary environmental justice issue would be potential air or water emissions that could adversely affect the health of these populations. Other issues could be any potential residential or business displacements, and noise impacts on populations near the power plant or ancillary facilities. However, the proposed Project would not result in significant air quality impacts or impacts to surrounding communities from emissions of toxic air contaminants, as discussed in Section 3.3. The proposed Project would also not involve wastewater discharges that could affect drinking water supplies (Section 3.7). Due to the project's design features and the distance of sensitive receptors from the proposed power islands, there would be no adverse noise impacts (Section 3.4). The proposed Project would not displace any homes or businesses, since the plant is proposed on fallow agricultural land. In light of these findings, the rural and remote character of the area, and the low population concentration near the AMSP/Lockhart Substation site, there would be no disproportionate or adverse impacts to low-income or minority populations present in the area around the solar plant. Any temporary impacts associated with construction, such as an increase in dust, would be minimized through compliance with San Bernardino County dust-control permitting requirements.

3.11.3.2 No-Action Alternative

Under the No-Action Alternative, DOE would not issue Mojave Solar a loan guarantee for construction of the AMSP, and Mojave Solar would not proceed with the proposed Project. Absent the proposed Project, there would be no impact to any populations, including minority or low-income populations.

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3.12 Public Health and Safety

This section describes the regulatory framework applied to the proposed Project for the construction and operation and the potential impacts from the proposed Project on public health and safety.

A Phase I Environmental Assessment was conducted for the AMSP/Lockhart Substation site. The proposed telecommunication lines would primarily use existing poles, new poles, and limited trenching and would have minimal impact to surface and subsurface conditions. The limited number of new poles and short lengths of trenching are located within existing utility corridor ROWs where historic use for other purposes is unlikely.

In general, the nature of a solar power-generating facility experiences minimal releases of toxic substances to the environment, including very low emissions of toxic air contaminants to the atmosphere. An HRA was conducted to assess the potential health impacts of hazardous air pollutant emissions from this engine. Potential public exposure to criteria pollutants emitted by the AMSP including nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), volatile organic compounds, and particulate matter with an aerodynamic diameter less than 10 microns (PM_{10}) is addressed in Section 3.3.

3.12.1 Regulatory Framework

3.12.1.1 Occupational Safety and Health Act

The Occupational Safety and Health Act of 1970 recognized that personal injuries and illnesses incurred in a work setting result in reduced productivity, wage loss, and medical expenses. As a result of the act, OSHA was established to ensure the health and safety of workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health (29 CFR Part 1910).

The Occupational Health Surveillance and Evaluation Program of the California Department of Public Health operates under an approved plan with the U.S. Department of Labor to retain jurisdiction over occupational safety and health issues in California, excluding mining operations, Indian Reservations, and federal employees.

3.12.1.2 Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) of 1976 delegates regulatory authority to USEPA with controlling the generation, transportation, treatment, storage, and disposal of hazardous waste (42 U.S.C. 6901 et seq.). RCRA also promulgated a framework for the management of nonhazardous solid wastes. The 1986 amendments to RCRA enabled USEPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances.

3.12.1.3 Comprehensive Environmental Response, Compensation, and Liability Act

Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, on December 11, 1980. This law created a tax on the chemical and petroleum industries and provided broad federal authority to respond directly to releases, or threatened releases, of hazardous substances that could endanger public health or the environment. CERCLA, as enacted:

- Established prohibitions and requirements concerning closed and abandoned hazardous waste sites;
- Provided for liability of persons responsible for releases of hazardous waste at these sites; and
- Established a trust fund to provide for cleanup when no responsible party could be identified.

The law authorizes two kinds of response actions:

- Short-term removals, where actions can be taken to address releases or threatened releases requiring prompt response; and
- Long-term remedial response actions that permanently and significantly reduce the dangers associated with releases or threats of releases of hazardous substances that are serious, but not immediately life threatening. These actions can be conducted only at sites listed on the USEPA National Priorities List.

CERCLA also enabled the revision of the National Contingency Plan, which provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The National Contingency Plan also established the National Priorities List. CERCLA was amended by the Superfund Amendments and Reauthorization Act on October 17, 1986, which included several changes and additions to the program.

3.12.2 Study Methodology

The analysis of public health and safety factors related to the proposed Project include construction-related impacts (worker safety, transportation, and storage of hazardous materials), presence of hazardous materials on the site, and long-term operational issues such as employee safety, emissions from the AMSP that could harm the public and storage of hazardous materials onsite. The study methodology includes a 2-mile study area for sensory receptors around the AMSP. An HRA was performed to assess potential impacts and public exposure associated with airborne emissions from the routine operation of the plant.

Air would be the dominant pathway for public exposure to chemical substances released by the AMSP. Emissions to the air would consist primarily of combustion by-products produced by the diesel-fired emergency fire pump engine. Potential health risks from combustion emissions would occur almost entirely by direct inhalation. To be conservative, additional pathways were included in the health risk modeling, i.e., soil ingestion, dermal exposure, mother's milk exposure; however, direct inhalation is considered the most likely exposure pathway. The HRA was conducted in accordance with guidance established by the California Office of Environmental Health Hazard Assessment and CARB. A summary of the HRA is provided in this section with the full analysis found in Appendix P.

In addition to the HRA, a Phase I Environmental Site Assessment was prepared to determine the currently known hazardous materials on or around the AMSP/Lockhart Substation site.

3.12.3 Affected Environment

3.12.3.1 AMSP/Lockhart Substation

The AMSP/Lockhart Substation site is located on a mix of open desert and agricultural land, in a rural area of the Mojave Desert. Sensitive receptors are defined as groups of individuals that may be more susceptible to health risks due to chemical exposure. Schools, both public and private, day care facilities, convalescent homes, and hospitals are of particular concern. The nearest sensitive receptors within the anticipated impact radius of the AMSP/Lockhart Substation site are listed in Table 3.12-1.

Table 3.12-1: Sensitive Receptors in the AMSP/Lockhart Substation Region

Receptor ID	Receptor Type	UTM Coordinates (E/N), m [1,2]
Sen1	Potential Worker	468476, 3876642
Sen2	Potential Residence	470898, 3874312
Sen3	Potential Residence	469851, 3874709
Sen4	Potential Residence	468814, 3875875
Sen5	Potential Residence	470485, 3874014
Sen6	Potential Residence	469756, 3874097
Sen7	Potential Residence	469950, 3873864
Sen8	Potential Residence	469880, 3872450
Sen9	Potential Residence	469820, 3872176
Sen10	Potential Residence	471749, 3874320

[1] All coordinates from Google Earth (center location of each receptor location), converted to NAD27.
[2] Anticipated impact area is ~2-mile radius from AMSP site center.
Source: GoogleEarth 2009

Air quality and health risk data presented by CARB in the 2009 *Almanac of Emissions and Air Quality for the State* show that over the period from 1990 through 2008, the average concentrations for the top 10 hazardous air pollutants have been substantially reduced, and the associated health risks for the state are showing a steady downward trend as well. This same trend is expected to have occurred in the MDAQMD as well as the MDAB. CARB-estimated emissions inventory values for the top 10 hazardous air pollutants for 2008 are presented in Table 3.12-2 for the air basin and the state. Public health studies related to respiratory illnesses, cancers, or related diseases were not identified for the local area within a 6-mile radius of the AMSP/Lockhart Substation site.

Table 3.12-2: Top 10 Toxic Air Contaminants

Hazardous Air Pollutant	Statewide Year 2008 Emissions (tons/yr)	MDAB Year 2008 Emissions (tons/yr)	Predicted Cancer Risk, per 10^6
Acetaldehyde	9103	349	ND
Benzene	10794	397	ND
1,3 Butadiene	3754	111	ND
Carbon tetrachloride	4.04	0.07	ND
Chromium 6	0.61	0.02	ND
Para-Dichlorobenzene	1508	ND	ND
Formaldehyde	20951	799	ND
Methylene chloride	6436	ND	ND
Perchloroethylene	4982	ND	ND
Diesel PM	35884	1450	ND

ND = no data
Source: Almanac of Emissions and Air Quality for the State, 2009

Cancer Risk

Cancer risk is the probability or chance of contracting cancer over a human life span, assumed to be 70 years. Carcinogens are not assumed to have a threshold below which there would be no human health impact. In other words, any exposure to a carcinogen is assumed to have some probability of causing cancer; the lower the exposure, the lower the cancer risk. Under various state and local regulations, an incremental cancer risk greater than 10 in a million due to a project is considered to be a significant impact on public health. The 10 in a million risk level is used by the Air Toxics Hot Spots (California Health and Safety Code 44300 et seq.) program and California's Proposition 65 as the public notification level for air toxic emissions from existing sources.

Noncancer health effects can be classified as either chronic or acute. In determining the potential health risks of noncancerous air toxics, it is assumed there is a dose of the chemical of concern below which there would be no impact on human health. The air concentration corresponding to this dose is called the Reference Exposure Level. Noncancer health risks are measured in terms of a hazard quotient, which is the calculated exposure of each contaminant divided by its reference exposure level. Hazard quotients for pollutants affecting the same target organ are typically summed with the resulting totals expressed as hazard indices for each organ system. A hazard index of less than 1.0 is considered to be an insignificant health risk. For this HRA, all hazard quotients were summed regardless of target organ. This method leads to a conservative, upper-bound assessment. Reference exposure levels used in the hazard index calculations were those published in the CARB/Office of Environmental Health Hazard Assessment listings dated February 2009.

Chronic toxicity is defined as adverse health effects from prolonged chemical exposure, caused by chemicals accumulating in the body for greater than 12% of a lifetime of 70 years. Because chemical accumulation to toxic levels typically occurs slowly, symptoms of chronic effects usually do not appear until long after exposure commences. The lowest no-effect chronic exposure level for a noncarcinogenic air toxic is the chronic reference exposure level. Below this threshold, the body is capable of eliminating or detoxifying the chemical rapidly enough to prevent its accumulation. The chronic hazard index was calculated using the hazard quotients calculated with annual concentrations.

Acute toxicity is defined as adverse health effects caused by a brief chemical exposure of less than or equal to 1 hour. For most chemicals, the air concentration required to produce acute effects is higher than the level required to produce chronic effects because the exposure duration is shorter. Because acute toxicity is predominantly manifested in the upper respiratory system at threshold exposures, all hazard quotients are typically summed to calculate the acute hazard index. One-hour average concentrations are divided by acute reference exposure levels to obtain a hazard index for health effects caused by relatively high, short-term exposure to air toxics.

Phase 1 Site Assessment

A Phase I Environmental Site Assessment was performed in 2009 for the AMSP/Lockhart Substation site in accordance with generally and currently accepted environmental engineering principles and practices (American Society of Testing Materials Standard E 1527-05). The focus of the investigation related exclusively to hazardous materials issues in direct relation only to soil and groundwater contamination at the site. The entire Phase I Environmental Assessment is included as Appendix P.

The AMSP/Lockhart Substation site was previously used for agricultural operations and cattle ranching. Ancillary support uses included residences for the agricultural operations staff, storage buildings for farm equipment, an aircraft hangar, and various fuel tanks for farm equipment and ranch operations. On the date of the physical/visual inspection of the property, several areas of soil discoloration were located, which could indicate some level of ground contamination, possibly from petroleum products. The Phase I investigation revealed that the storage tanks, aboveground and underground, had been previously removed. Interviews with former ranch staff revealed that there were no known spills or contamination from petrochemicals, fertilizers, or pesticides.

It is concluded from the investigation, coupled with interviews with regulatory agencies concerning the property, and checks of standard state and federal databases (e.g. CERCLA, etc.), that there is possibly some minor surface ground staining at the AMSP/Lockhart Substation site. No recorded spills were identified and no areas of serious environmental concern were noted onsite or on adjacent properties.

Electric and Magnetic Fields

According to the National Institute of Environmental Health Sciences, electric and magnetic fields are "invisible lines of force associated with the production, transmission, and use of electric power such as those associated with high-voltage transmission lines, secondary power lines, and home wiring and lighting" (National Institute of Environmental Health Sciences 2009). Electric and magnetic fields also occur naturally from sources such as the electric charges created by molten activity in the earth's core. Given the ubiquity of electric power and continuous presence of the earth's magnetic field, humans are exposed to electric and magnetic fields throughout the course of their lives.

Electric fields are produced by voltage (or electric charges). Electric fields increase in strength as the voltage increases and are measured in units of volts per meter. Magnetic fields result from the flow of electrical current in transmission line conductors or home wiring, the earth's ambient field, or any electrical device. The magnetic field also increases in strength exponentially as the current increases and is measured in units of Gauss or Tesla. Gauss is the unit most commonly used in the United States and Tesla is the internationally accepted scientific unit; 1 Tesla is equivalent to 10,000 Gauss. Because a Gauss or Tesla are both very large fields and most magnetic field exposures are significantly lower, values reported and typically measured in human environments are in milligauss (1/1,000 of a Gauss) and microtesla (1/1,000,000 of a Tesla, equivalent to 10 milligauss).

Sources of existing electric and magnetic fields in the vicinity of the AMSP/Lockhart Substation site are the existing transmission and distribution lines located adjacent and offsite, and common household wiring and appliances for residences in the vicinity of the existing transmission lines. Electric and magnetic field levels in homes and businesses vary widely with wiring configurations, the types of equipment and appliances in use, and proximity to these sources.

3.12.3.2 Telecommunication System

The telecommunication system for the proposed Project would utilize fiber-optic cables strung primarily on existing poles. The telecommunication corridors are colocated on existing poles and towers and are located in predominantly rural areas, where the land use is vacant or consist of fallow agriculture. Areas near the city centers of Victorville, Adelanto, and Barstow have suburban to urban characteristics.

A Phase I Environmental Assessment was not performed for the proposed telecommunication system. Since the fiber-optic cable would be strung primarily on existing poles, there would be no ground disturbance for those activities. New poles and trenching would be limited, with excavation projected to be shallow and occurring within existing utility corridors.

A limited number of new poles and trenching is required for this system. The basic component of fiber-optic lines is a type of glass and does not emit electrical radiation. Fiber-optic lines use light, not electricity, to transmit data signals and information and therefore electromagnetic fields would not be generated by the lines.

3.12.4 Environmental Consequences

3.12.4.1 Proposed Action

All activities associated with construction and operation of the proposed Project would be conducted in accordance with local, state, and federal regulations to protect the health and safety of Mojave Solar and SCE employees and the general public, as described below.

3.12.4.1.1 AMSP/Lockhart Substation

Construction Phase

No substantive public health effects are expected during the construction phase. Strict construction practices that incorporate worker safety and compliance with applicable laws, ordinances, and regulations would be followed (see Appendix P). In addition, mitigation measures to reduce air emissions from construction impacts would be implemented as described in Section 3.3.

Temporary emissions from construction-related activities are discussed in Section 3.3. Ambient air modeling for PM_{10}, CO, SO_2, and nitrogen oxides (NO_x) was performed and construction-related emissions were determined to be temporary and localized, and would not result in long-term impacts to the public.

Hazardous Materials

Construction of the AMSP interconnect facilities would generate limited amounts of certain hazardous and solid wastes. Hazardous waste management plans would be in place so the potential for public exposure is minimal. No acutely hazardous materials would be used or stored onsite during construction. Due to the development of the AMSP and Lockhart Substation on previously disturbed agricultural land, limited demolition of barren structures would be required. Generated wastes would be managed and disposed of in accordance with all applicable regulations under RCRA and equivalent California statutes.

Construction of the Lockhart Substation would require the limited use of hazardous materials such as fuels, lubricants, and cleaning solvents. Quantities of hazardous materials expected to be used during the AMSP/Lockhart substation construction phase are listed in Tables P-1 and P-2 in Appendix P. Compliance with applicable laws would be followed with all applicable laws relating to hazardous materials use, storage, and disposal.

The California Accidental Release Program regulations and CFR Title 40 Part 68 under the CAA establish emergency response planning requirements for acutely hazardous materials. Where applicable, these regulations require preparation of a Risk Management Plan, which is a comprehensive program to identify hazards and predict the areas that may be affected by a release of a program listed hazardous material.

Worker Safety

During construction, as well as during AMSP and Lockhart Substation operations, health and safety procedures would be implemented in accordance with OSHA and the Occupational Health Surveillance and Evaluation Program of the California Department of Public Health standards to minimize the risk of accidents or injuries. Safety planning and regular training sessions would occur to ensure that workers were adequately prepared to address any site-specific hazards, such as electrocution, fires, accidents (such as slips, trips, or falls), or exposure to poisonous wildlife. In addition, workers would be trained on the appropriate use of safety equipment and personal protective equipment.

Operations

Hazardous Materials Management

Management of hazardous materials during AMSP and Lockhart Substation operations would pose little risk of environmental impacts. Details regarding hazardous materials are presented in Appendix P. Only limited hazardous materials would be used or generated during operations, including gasoline, diesel fuel, oil, lubricants, solvents, paints, HTF, and water treatment chemicals. (Refer to Tables P-3 and P-4 in Appendix P for a complete list of materials and quantities projected.) All hazardous materials used and generated during operations would be carefully managed in compliance with the manufacturers' guidance and in accordance with state and federal standards applicable to conditionally exempt small quantity generators under RCRA. These standards would ensure that all materials were handled safely and that any releases were quickly and comprehensively managed to minimize any risk of environmental harm.

Potential public health impacts from the use of hazardous materials are only expected to occur as a result of an accidental release. The proposed AMSP would include many safety features designed to prevent and minimize impacts from the use and accidental release of hazardous materials. Areas subject to potential leaks of hazardous materials would be paved and bermed. Incompatible materials would be stored in separate containment areas. Containment areas would be drained to either a collection sump or to holding or neutralization tanks. Also, piping and tanks exposed to potential traffic hazards would be additionally protected by traffic barriers.

Normal use of hazardous materials and compliance with plans and measures identified above would minimize the potential impacts to public health.

Worker Safety

See construction discussion above. All AMSP employees will apply with applicable Cal/OSHA requirements. Appendix P details the laws, rules, ordinances, and regulations that apply to the operational phase of the AMSP.

Risks from Toxic Air Pollutants

Emissions of toxic pollutants potentially associated with the AMSP were estimated using emission factors approved by CARB and USEPA. Concentrations of these pollutants in air potentially associated with AMSP and Lockhart Substation emissions were estimated using Hot Spots Analysis and Reporting Program dispersion modeling. Modeling allows the estimation of both short-term and long-term average concentrations in air for use in an HRA, accounting for site-specific terrain and meteorological conditions. Health risks potentially associated with the estimated concentrations of pollutants in air were characterized in terms of excess lifetime cancer risks (for carcinogenic substances), or comparison with reference exposure levels for noncancer health effects (for noncarcinogenic substances).

Health risks were evaluated for a hypothetical maximum exposed individual located at the maximum impact receptor. The hypothetical maximum exposed individual is an individual assumed to be located at the maximum impact receptor location, which is a residential receptor where the highest concentrations of air pollutants associated with AMSP emissions are predicted to occur, based on the air dispersion modeling. Human health risks associated with emissions from the AMSP and Lockhart Substation are unlikely to be higher at any other location than at the location of the maximum impact receptor. If there is no significant impact associated with concentrations in air at the maximum impact receptor location, it is unlikely that there would be significant impacts in any location in the vicinity of the AMSP/Lockhart Substation site. The highest concentration location represents the maximum impact receptor.

The excess lifetime cancer risk associated with concentrations in air estimated for the AMSP maximum impact receptor location is estimated to be 259 in 1,000,000. Excess lifetime cancer risks less than 10 in 100,000, with T-BACT, are unlikely to represent significant public health impacts that require additional controls of facility emissions. Risks higher than one in a million may or may not be of concern, depending upon several factors. These include the conservatism of assumptions used in risk estimation, size of the potentially exposed population, and toxicity of the risk-driving chemicals. Human health risks associated with emissions from the AMSP and Lockhart Substation are unlikely to be higher at any other location than at the location of the maximum impact receptor. If there is no significant impact associated with concentrations in air at the maximum impact receptor location, it is unlikely that there would be significant impacts in any other location in the vicinity of the AMSP/Lockhart Substation site.

Cancer risks potentially associated with facility emissions were also assessed in terms of cancer burden. Cancer burden is a hypothetical upper-bound estimate of the additional number of cancer cases that could be associated with emissions from the AMSP and Lockhart Substation.

Cancer burden is calculated as the worst-case product of excess lifetime cancer risk (one in a million cancer risk level and isopleth distance [the line connecting points on a graph or map that have equal or corresponding values]) and the number of individuals at that risk level. A worst-case estimate of cancer burden was calculated based on the following assumptions.

The one in a million isopleth was not reached for the AMSP, i.e., the highest predicted cancer risk was 259 in one million. The calculated cancer burden for the AMSP is therefore zero. As described previously, human health risks associated with emissions from the proposed AMSP and Lockhart Substation are unlikely to be higher at any other location than at the location of the maximum impact receptor. Therefore, the risks for all of these individuals would be lower (and in most cases, substantially lower) than 259 in one million. The estimated cancer burden was zero, indicating that emissions from the AMSP would not be associated with any increase in cancer cases in the previously defined population. In addition, the cancer burden is less than the Rule 1320 threshold values. As stated previously, the methods used in this calculation considerably overstate the potential cancer burden, further suggesting that AMSP emissions are unlikely to represent a significant public health impact in terms of cancer risk.

The acute and chronic noncancer hazard quotients in air for all target organs fall below 1.0. Table P-9 in Appendix P discusses the acute and nonhazard quotients. As described previously, a hazard quotient less than 1.0 is unlikely to represent significant impact to public health and the human health risks associated with emissions from the AMSP and Lockhart Substation are unlikely to be higher at any other location than at the location of the maximum impact receptor. If there is no significant impact associated with concentrations in air at the maximum impact receptor location, it is unlikely that there would be significant impacts in any other location in the vicinity of the AMSP site.

The estimates of excess lifetime cancer risks and noncancer risks associated with chronic or acute exposures fall below thresholds used for regulating emissions of toxic pollutants to the air. Historically, exposure to any level of a carcinogen has been considered to have a finite risk of inducing cancer. In other words, there is no threshold for carcinogenicity. Since risks at low levels of exposure cannot be quantified directly by either animal or epidemiological studies, mathematical models have estimated such risks by extrapolation from high to low doses. This modeling procedure is designed to provide a highly conservative estimate of cancer risks based on the most sensitive species of laboratory animal for extrapolation to humans. In other words, the assumption is that humans are as sensitive as the most sensitive animal species. Therefore, the true risk is not likely to be higher than risks estimated using unit risk factors and is most likely lower, and could even be zero.

An excess lifetime cancer risk of one in a million is typically used as a screening threshold of significance for potential exposure to carcinogenic substances in air. The excess cancer risk level of one in a million, which has historically been judged to be an acceptable risk, originates from efforts by the Food and Drug Administration to use quantitative HRA for regulating carcinogens in food additives in light of the zero tolerance provision of the Delany Amendment (Hutt 1985). The associated dose, known as a “virtually safe dose,” has become a standard used by many policy makers and the lay public for evaluating cancer risks. However, a study of regulatory actions pertaining to carcinogens found that an acceptable risk level can often be determined on a case-by-case basis. This analysis of 132 regulatory decisions found that regulatory action was not taken to control estimated risks below one in a million, which are called *de minimis* risks. *De minimis* risks are historically considered risks of no regulatory concern. Chemical exposures with risks above four in ten thousand, called "*de manifestis*" risks, were consistently regulated. "*De manifestis*" risks are typically risks of regulatory concern. The risks falling between these two extremes were regulated in some cases, but not in others (Travis et al. 1987).

The estimated lifetime cancer risks to the maximally exposed individual located at the AMSP maximum impact receptor are well below the 10 in 100,000 significance level (with T-BACT), and the aggregated cancer burden associated this risk level is less than 1.0 excess cancer case. These risk estimates were calculated using assumptions that are highly health conservative. Evaluation of the risks associated with the AMSP and Lockhart Substation emissions should consider that the conservatism in the assumptions and methods used in risk estimation considerably overstates the risks from AMSP emissions. Based on the results of this HRA, there are no significant public health impacts anticipated from emissions of toxic pollutant to the air from the proposed AMSP and Lockhart Substation.

Electromagnetic Fields

The parabolic trough arrays would not generate an electromagnetic field (EMF) because the structures are used to collect and concentrate sunlight, which is then used to heat the HTF. The proposed Project would generate an EMF at the AMSP power islands and substation. This is a common occurrence and typical for a project of this type. The central location of the power islands within the AMSP/Lockhart Substation site would buffer adjacent land uses from the EMF.

New electric transmission line is required for the proposed Project interconnect. Two 1,500-foot-long lines are required to connect the substation to the existing 220-kV lines. These two transmission lines do not travel through residential areas and, based on recent findings of the National Institute of Environmental Health Sciences (1999), EMF exposures are not expected to result in a significant impact on public health. The National Institute of Environmental Health Sciences report to the U.S. Congress found that "the probability that EMF exposure is truly a health hazard is currently small. The weak epidemiological associations and lack of any laboratory support for these associations provide only marginal scientific support that exposure to this agent is causing any degree of harm" (National Institute of Environmental Health Sciences 1999).

Air Quality

Emissions of criteria pollutants would adhere to NAAQS and CAAQS as discussed in 3.3. The proposed Project would also include emission control technologies necessary to meet the required emission standards specified for criteria pollutants under MDAQMD rules. Offsets would not be required because the AMSP would not be major source. Finally, air dispersion modeling results (presented in Section 3.3) show that emissions would not result in concentrations of criteria pollutants in air that exceed ambient air quality standards (either NAAQS or CAAQS). These standards are intended to protect the general public with a wide margin of safety. Therefore, the AMSP and Lockhart Substation are not anticipated to have significant impacts on public health from emissions of criteria pollutants.

The interconnection will not have any emission issues because the components would simply transmit electrical energy from the Lockhart Substation to the existing offsite transmission line.

Other Potential Health Risks

In addition to being a source of potential hazardous air pollutants, the possibility exists for bacterial growth to occur in the cooling towers, including *Legionella*. *Legionella* is a bacterium that is ubiquitous in natural aquatic environments and is also widely distributed in man-made water systems. Transmission to people results mainly from inhalation or aspiration of aerosolized contaminated water. The operation of the AMSP will apply practices to prevent the occurrence of *Legionella*. A detailed description of *Legionella* and the operating and management practices to prevent its occurrence is in Appendix P, *Legionella* BMPs. No significant health impacts are anticipated.

HTF is considered a hazardous material and the project includes both administrative and engineering controls to avoid the potential for accidental release or leaks that could pose a health risk to employees or the general population. Controls include: (1) the inspection and maintenance program which includes the identification of leaks and necessary repairs, (2) the preparation of plans related to the safe handling and management of hazardous materials, including HTF, and (3) installation of a sufficient number of isolation valves to ensure that HTF leaks do not pose a health risk. Implementation of proposed administrative and design measures minimize the risk to employees and the public.

3.12.4.1.2 Telecommunication Line

Construction Phase

Stringing the telecommunication line on existing poles, construction of new poles, and limited cable trenching would generate minimal dust, as discussed in Section 3.3. Refer also to previous discussion of construction-phase controls for worker safety and hazardous materials management.

Operations

The proposed fiber-optic cable would not result in operational public health and safety impacts. The cable would transmit light, not electricity, and would not generate an EMF. If the cable were to break and come into contact of the ground, it would not electrocute people or animals, nor cause a fire.

The fiber-optic cable is made from a type of glass and would not generate hazardous emissions or by-products. It would be strung from new or proposed poles and would not come into direct contact with sensitive receptors.

3.12.4.2 No-Action Alternative

Under the No-Action Alternative, DOE would not issue Mojave Solar a loan guarantee for construction of the AMSP, and Mojave Solar would not proceed with the proposed Project. Absent the proposed Project, no personnel or members of the public would be exposed to hazardous materials or conditions beyond those that currently exist.

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3.13 Transportation

3.13.1 Study Methodology

This section addresses the potential impact of the AMSP, Lockhart Substation, interconnection, and fiber-optic telecommunication system on traffic and transportation. Section 3.13.2 describes the study roadway network within the study area under existing conditions. The existing traffic conditions and level of service (LOS) analysis are used to project the traffic conditions on the local and regional roadways network in the near term while the proposed Project is under construction, as well as future traffic conditions under AMSP and Lockhart operations. Baseline information includes roadway average daily trips and intersection peak hour turning movement traffic counts that were collected for the study roadways and intersections.

The following traffic analysis is based primarily on the analysis prepared by Wilson & Company, Inc. in June 2009 for the CEC AFC prepared for the solar plant. The information from that study is used in this EA to determine potential impacts from the AMSP, Lockhart Substation, interconnect, and fiber-optic telecommunication system. The Lockhart Substation, interconnect, and fiber-optic cable proposed for this proposed Project would generate short-term construction traffic and minimal long-term operational traffic associated with periodic maintenance trips.

The 2009 traffic analysis was conducted in accordance with the 2000 Highway Capacity Manual (HCM 2000) methodologies and procedures. Daily, morning, and evening peak hour traffic volumes were used to evaluate the study area street and intersection capacities and resulting LOS. Additionally, state highway ramp junctions were evaluated using the Intersection Lane Vehicles procedure as described in Topic 406 of the Caltrans Highway Design Manual. Refer to Appendix Q for baseline traffic counts and modeling.

3.13.2 Affected Environment

3.13.2.1 AMSP and Lockhart Substation

The proposed location of the AMSP and Lockhart Substation is approximately 6 miles north of SR-58 on Harper Lake Road in the unincorporated area of San Bernardino County. The AMSP/Lockhart Substation site is approximately 20 miles northwest of the City of Barstow and 12 miles northeast of Kramer Junction (SR-58/U.S. Highway 395).

The regional traffic and transportation setting for the AMSP/Lockhart Substation area consists of a few main highways and interstates and a number of smaller arterials, collector streets, residential streets, and dirt roads, mostly associated with agriculture or off-road vehicle recreational use. As shown in Figure 3.13-1, Interstate 15 (I-15), U.S. Highway 395, and SR-58 are the three main regional transportation corridors in the study area. Smaller roads in proximity to the AMSP/Lockhart Substation are summarized below.

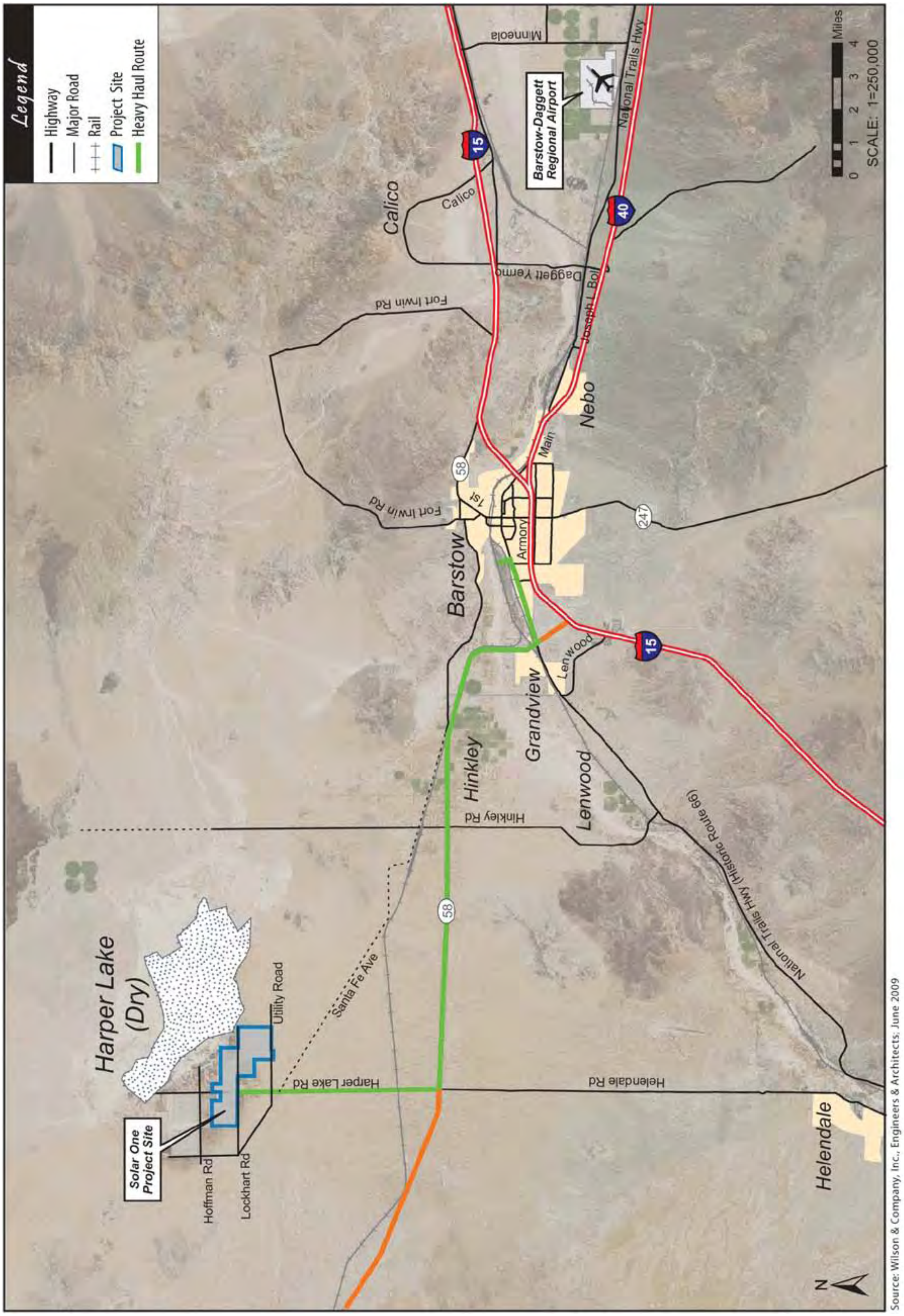

Figure 3.13-1: Regional Transportation Network

Access to the proposed AMSP/Lockhart Substation from SR-58 would be via Harper Lake Road or Santa Fe Avenue. The roadway network in vicinity of the AMSP/Lockhart Substation site is displayed in Figure 3.13-2. The existing regional and local transportation facilities in proximity to the AMSP/Lockhart Substation site are described below.

State Route 58

SR-58 is a regional state highway connecting the City of Bakersfield and the City of Barstow. SR-58 connects to SR-385 to the west of the AMSP/Lockhart Substation site and to I-15 to the east of the AMSP/Lockhart Substation site. The only access to the AMSP/Lockhart Substation site from SR-58 is via Harper Lake Road. Between Harper Lake Road and Main Street (Barstow), SR-58 is a two-lane to four-lane state highway. Traffic counts conducted on April 9, 2009, by National Data Services for Wilson & Company, Inc. indicate that the existing number of average daily trips on SR-58 is approximately 12,000 per day, with trucks comprising approximately 36%.

Harper Lake Road

Harper Lake Road is a two-lane lightly traveled north-south roadway that bisects the AMSP/Lockhart Substation site, with approximately 75% of the site located to the east of Harper Lake Road and 25% of the site to the west of Harper Lake Road. Harper Lake Road provides the primary access to the AMSP/Lockhart Substation site and is currently a two-lane roadway with a striped median.

Santa Fe Avenue

Santa Fe Avenue is an east-west undivided roadway that connects Harper Lake Road and the AMSP/Lockhart Substation site to SR-58 via Hinkley Road.

Lockhart Road

Lockhart Road is an east-west undivided dirt roadway that provides access from Harper Lake Road via Lockhart Ranch Road to the existing SEGS solar power plants and approximately three local residences.

Lockhart Ranch Road

Lockhart Ranch Road is a locally maintained north-south undivided dirt roadway that connects Lockhart Road to the existing SEGS solar power plants.

Hoffman Road

Hoffman Road is an east-west dirt roadway that serves as a local access road to the existing SEGS solar power plants between Lockhart Ranch Road to the west and Harper Lake Road to the east.

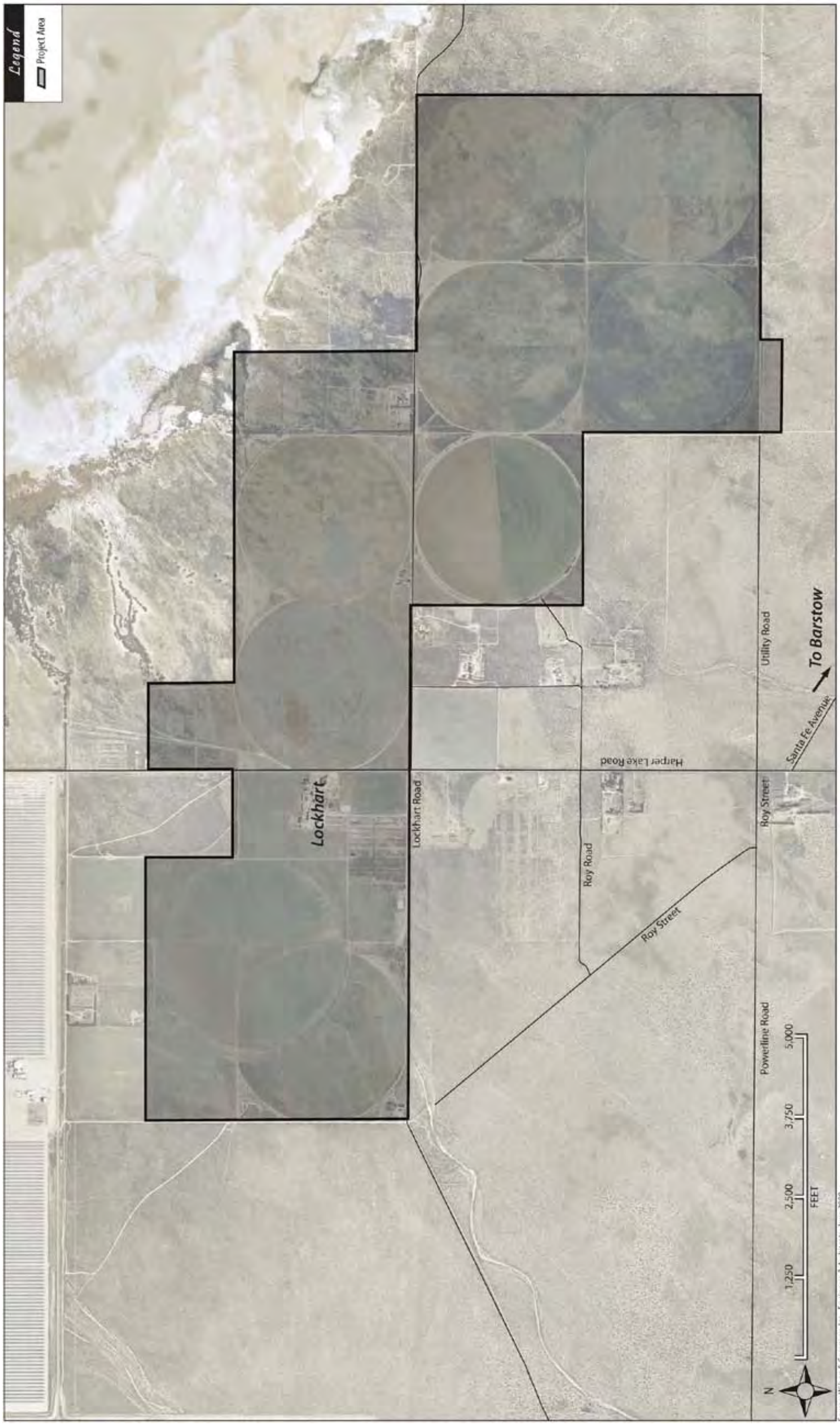

Figure 3.13-2: Local Transportation Network

Hinkley Road

Hinkley Road is a north-south two-lane undivided roadway that connects Santa Fe Avenue to SR-58.

Main Street (Historic Route 66)

Main Street is a historic route passing through the City of Barstow, connecting with SR-58 to the west and I-15 to the east. Main Street is a four-lane roadway with a continuous left-turn lane between SR-58 and Avenue H.

Truck Routes

Weight and load limitations are specified in the California Vehicle Code Sections 35550–35559. In addition, local jurisdictions have their own truck weight and load restrictions as well. The County of San Bernardino allows up to the maximum load and weight under the California Vehicle Code on their roadways. SR-58 is a Surface Transportation Assistance Act highway, which allows trucks up to the maximum legal length of 65 feet with load and weight limits per the California Vehicle Code limitations.

Existing Roadway Operations

The 2000 HCM was used to assess the capacity and operational characteristics of the study street and highway network. The LOS analysis provides a qualitative assessment of the street network and accounts for such factors as traffic volumes, roadway and intersection geometrics, speed, delays, and traffic control. The LOS criteria for roadways are presented in Appendix Q.

The San Bernardino County Traffic Impact Study Guidelines specify that all County roadways operate at LOS D or better. The City of Barstow General Plan specifies LOS E as the minimum acceptable LOS on all City roadways and intersections.

The average daily trips volumes were collected on April 9, 2009, for all study roadways. Classification counts to determine the proportion of trucks in the traffic stream were conducted on Main Street (Historic Route 66) and SR-58. A Passenger Car Equivalent factor of 1.5 was used to convert the truck traffic in the mixed traffic flow of cars and trucks into a uniform car equivalent traffic volume.

The following study roadways and intersections were analyzed in this study.

Roadways:

- Main Street (Historic Route 66)
- SR-58

Intersections:

- SR-58/Harper Lake Road (Two-Way Stop-Controlled)
- SR-58/Lenwood Road (Signalized)
- Main Street/SR-58 Southbound Ramps (Signalized)
- Main Street/SR-58 Northbound Ramps (Signalized)
- Main Street/Parking Lot Driveway (One-Way Stop-Controlled)

Table 3.13-1 presents a summary of the roadway segment average daily trips, volume-to-capacity (V/C) ratio, and LOS under existing conditions. The table shows that the study roadway segments are currently operating at acceptable LOS.

Table 3.13-1: Roadway Level of Service: Existing Conditions

Road	Segment	Volume	Peak Hour %	Directional Split	Lanes Per Direction	PHF	% HVF	Volume (pc/h/ln)	V/C	LOS
SR-58	Harper Lake Road to Lenwood Road	13,045	13.0%	0.55	1	0.92	20.0%	1,267	0.75	C
Main Street	SR-58 to Osborne Road	7,822	14.0%	0.54	2	0.92	20.0%	402	0.24	A

Source: Wilson & Company, Inc., Engineers & Architects; June 2009

Existing Intersection Operations

Existing morning (AM) and evening (PM) peak-hour turning movement counts were conducted on April 9, 2009, between the hours of 7:00 and 9:00 AM and 4:00 and 6:00 PM. Figure 3.13-3 presents a summary of the AM and PM peak hour turning volumes at the study intersections. Table 3.13-2 shows information for signalized and unsignalized intersections. Refer to Tables Q-1 and Q-2 in Appendix Q for the LOS characteristics for both signalized and unsignalized intersections.

Table 3.13-2: Peak Hour Intersection Level of Service Results: Existing Conditions

#	Intersection	AM		PM	
		Delay (Sec)	LOS	Delay (Sec)	LOS
1	SR-58/Harper Lake Road[1]	12.4	B	16.1	C
2	SR-58/Lenwood Road	3.2	A	3.1	A
3	Main Street/SR-58 SB Ramps	5.1	A	4.5	A
4	Main Street/SR-58 NB Ramps	11.3	B	11.9	B
5	Main Street/Parking Lot Driveway[(1)]	N/A	N/A	N/A	N/A

[1] Indicates a one-way or two-way Stop Controlled Intersection. Delay and LOS are for stopped approach (worst).
Source: Wilson & Company, Inc., Engineers & Architects; June 2009

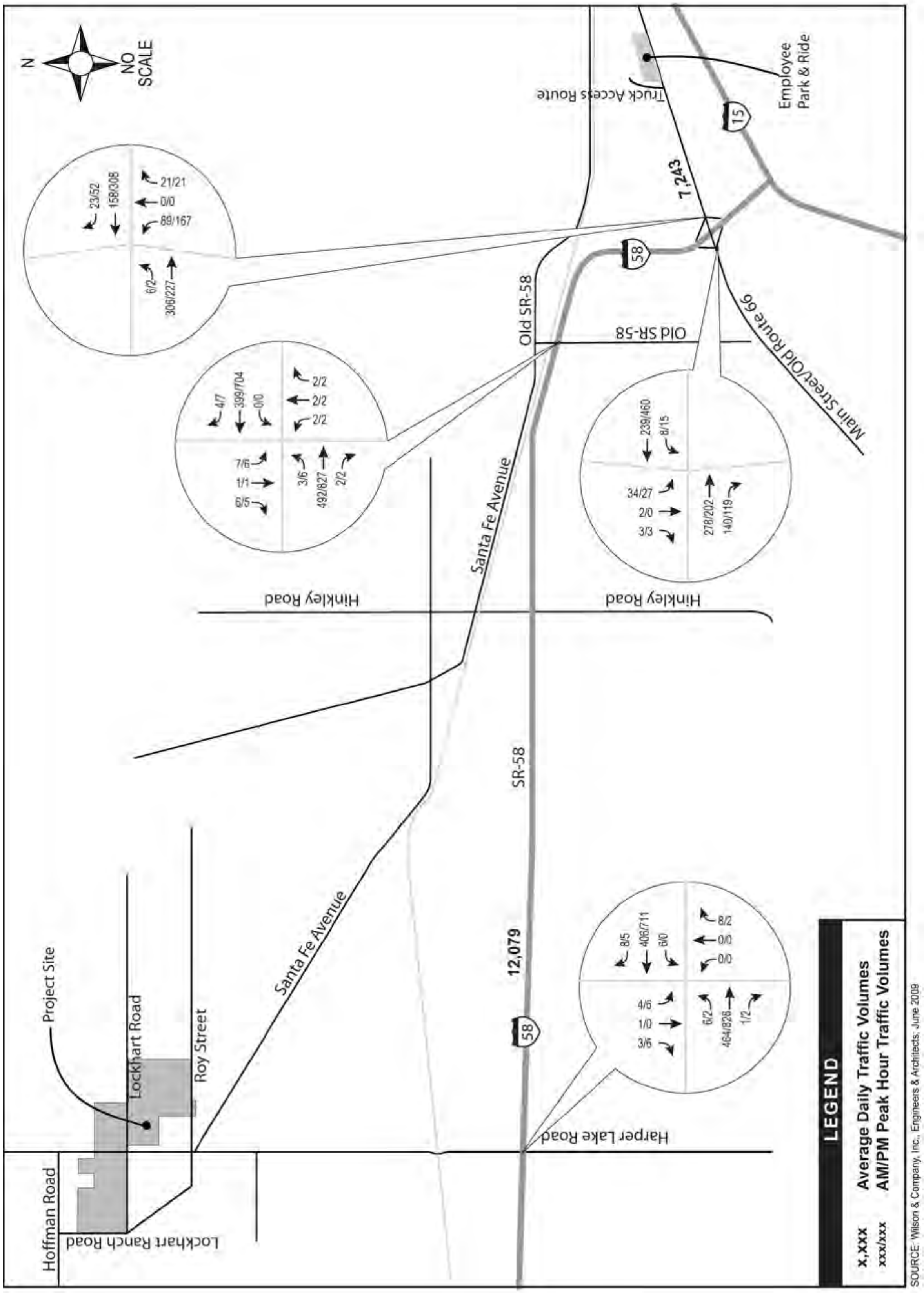

Figure 3.13-3: Existing Traffic Volumes

Existing Ramp Junction Operations

All signalized intersections at freeway ramp junctions were analyzed using the Intersection Lane Vehicles procedure as described in Topic 406 of the Caltrans Highway Design Manual. The Intersection Lane Vehicles analysis provides an assessment of the ramp junction operational characteristic. Refer to Table Q-3 in Appendix Q for a description of the Intersection Lane Vehicles capacity characteristics and Table 3.13-3 for the ramp junction existing conditions.

Table 3.13-3: Ramp Junction Capacity Analysis: Existing Conditions

Ramp Intersection	Peak Hour	Intersection Lane Vehicles/Hour	Description
Main Street/SR-58 NB Ramps	AM	416	*<1200: (Under Capacity)*
	PM	498	*<1200: (Under Capacity)*
Main Street/SR-58 SB Ramps	AM	323	*<1200: (Under Capacity)*
	PM	490	*<1200: (Under Capacity)*

Source: Wilson & Company, Inc., Engineers & Architects; June 2009

3.13.2.2 AMSP Telecommunication System

Lockhart to Tortilla Substation Fiber-optic Line

In addition to the roads mentioned under the AMSP and Lockhart Substation section above, the fiber-optic route follows along Summerset Road, Community Road, Lenwood Road, Sun Valley Road, I Street, and Siderite Road. Existing LOS counts were not collected for these roadways. These roads would provide the primary access for construction vehicles and equipment.

Lockhart to Kramer Substation Fiber-optic Line

The fiber-optic route for the Lockhart to Kramer Substation line follows along Lockhart Road, Harper Lake Road, and a dirt utility road, and crosses U.S. Highway 395 and SR-58 at the very western end of the route. Refer to previous descriptions of Lockhart Road, Harper Lake Road, U.S. Highway 395, and SR-58. These roads would provide the primary access routes for construction vehicles and equipment.

Kramer to Victor Substation Fiber-optic Line

U.S. Highway 395 would be used to access some of the unimproved roads for a majority of the route. As the route nears the communities of Victorville and Adelanto, local streets, including Palmdale Road, would be used for construction vehicle and equipment access.

3.13.3 Environmental Consequences

3.13.3.1 Proposed Action

3.13.3.1.1 AMSP and Lockhart Substation

Construction of the AMSP, Lockhart Substation and interconnect would occur simultaneously over a period of approximately 26-31 months, with the bulk of the construction traffic going to and from the AMSP/Lockhart Substation site. The proposed Project would generate the most traffic during the construction phase, as more people would be utilized to build the AMSP/Lockhart Substation than to operate the AMSP. A detailed discussion of the number of employees during the construction phase is in Section 3.10. The AMSP and Lockhart Substation construction workers and maintenance employees traveling to and from the site would be expected to use the regional and local roadway network shown in Figures 3.13-1 and 3.13-2. To minimize the effects of the construction traffic onto the local roadway network, Mojave Solar is providing a shuttle service from a park-and-ride lot located in nearby Adelanto.

As the workers' arrival times range between 6:00 AM and 8:00 AM, an hour earlier than the counted 7:00 to 9:00 AM peak period, intersection turning movements were developed for the 6:00 to 7:00 AM peak hour using the counted hourly segment traffic volumes and the peak hour intersection turning movement pattern for the 7:00 to 8:00 AM peak hour. Work would be done in two main work shifts. The first shift would start between 6:00 and 8:00 AM and end between 4:00 and 6:00 PM, while the second shift would start at 4:00 PM and end at 2:00 AM.

Heavy Haul Routes

The AMSP proposes to use the following designated heavy haul route from the Barstow rail yard to the AMSP/Lockhart Substation site: south on Avenue H, west on Main Street (Historic State Route 66), north on SR-58, and then north on Harper Lake Road. Refer to Figure Q-1 in Appendix Q for a depiction of the heavy haul routes. SR-58 is a Surface Transportation Assistance Act highway, which allows trucks up to the maximum legal length of 65 feet with load and weight limits per the California Vehicle Code limitations. All deliveries to and from the AMSP/Lockhart Substation site will comply with these limitations.

Near-Term Year 2012 Traffic Conditions

The near-term year 2012 traffic conditions were assessed for the traffic and transportation impacts associated with the construction and operation of the AMSP and Lockhart Substation. This analysis primarily assesses expected impacts on roadway and intersection LOS during both the construction and operation of the AMSP.

Construction is expected to start in spring 2011 and last approximately 26 to 31 months. Since the number of workers during the operation phase is relatively insignificant, a worst-case scenario analysis was conducted for the peak construction traffic period. Appendix F provides a breakdown of construction worker requirements on a monthly basis throughout the entire construction period. Figure 5.13-8 in Appendix Q displays the Near-Term Year 2012 Base traffic volumes.

Project Construction Traffic Generation

Estimates of the number of daily workers throughout the construction duration have been developed for the AMSP/Lockhart Substation. Based upon historic experience of similar projects, it is estimated that 20% of the workforce would carpool, with an average carpool vehicle occupancy of two persons per vehicle. It is estimated that 42% of the construction workers will be bused to the AMSP/Lockhart Substation site from a park-and-ride in nearby Adelanto. The maximum number of truck trips is expected to reach 67 one-way trips per day during the 26-31 month duration of the proposed Project construction, with the majority of the trips traveling between the Barstow rail yard and the AMSP/Lockhart Substation site during the off-peak hours.

The analysis was conducted using the worst-case scenario by assuming peak construction worker and truck traffic throughout construction. The peak traffic hours of the day were determined to be the 7:00 to 8:00 AM and the 4:00 to 5:00 PM peak hours. Based on the HCM 2000 guidelines, bus traffic was converted to Passenger Car Equivalent units at a rate of three passenger cars for each bus. Table 3.13-4 displays the construction traffic trips to and from the AMSP/Lockhart Substation site for both the AM and PM peak hours and Table Q-4 in Appendix Q presents the construction trip estimates for the various types of construction vehicles during the construction period.

Table 3.13-4: AMSP/Lockhart Substation Trip Generation: Construction Phase – Peak Hours

	Project Site		Park-and-Ride	
Peak Period	**Trips (In/Out)**	**Passenger Car Equivalent**	**Trips (In/Out)**	**Passenger Car Equivalent**
AM (car)	300/0	300/0	169/0	169/0
AM (bus)	3/3	9/9	3/3	9/9
AM (total)	**N/A**	**309/9**	**N/A**	**178/9**
PM (car)	0/300	0/300	0/169	0/169
PM (bus)	3/3	9/9	3/3	9/9
PM (total)	**N/A**	**9/309**	**N/A**	**9/178**

Source: Wilson & Company, Inc., Engineers & Architects; June 2009

Near-Term Base plus Project Construction - Roadway Level of Service

The peak hour construction worker traffic volume was added to the Near-Term Base traffic volumes for each of the roadway segments. Table 3.13-5 displays the results of the roadway LOS analysis under Near-Term Base plus Project Construction conditions. Based upon the analysis results shown in the table, all of the roadway segments are expected to operate at acceptable LOS.

Table 3.13-5: Roadway Level of Service: Near-Term Base plus Project Construction

Road	Segment	Volume	Peak Hour %	Directional Split	Lanes Per Direction	PHF	% HVF	Volume (pc/h/ln)	V/C	LOS
SR-58	Harper Lake Road to Lenwood Road	13,965	13.0%	0.55	1	0.92	20.0%	1,357	0.80	D
Main Street	SR-58 to Osborne Road	8,662	14.0%	0.54	2	0.92	20.0%	445	0.26	A

Source: Wilson & Company, Inc., Engineers & Architects; June 2009

Near-Term Base plus Project Construction - Intersection Level of Service

The peak hour construction traffic volumes were added to the Near-Term Base traffic volumes for each of the intersections within the study roadway network. The results of the Near-Term Base plus Project Construction traffic analysis are displayed in Table 3.13-6 for the AM and PM peak hours.

Table 3.13-6: Peak Hour Intersection Level of Service: Near-Term Base plus Project Construction

Intersection	AM					PM				
	Base		During Construction			Base		During Construction		
	Delay (Sec)	LOS	Delay (Sec)	LOS	Δ	Delay (Sec)	LOS	Delay (Sec)	LOS	Δ
SR-58/Harper Lake Road[1]	13.0	B	33.3	D	20.3	17.1	C	31.3	D	14.2
SR-58/Lenwood Road	4.0	A	4.1	A	0.1	4.3	A	4.6	A	0.3
Main Street/ SR-58 SB Ramps	4.8	A	10.1	B	5.3	4.3	A	5.4	A	1.1
Main Street/ SR-58 NB Ramps	10.9	B	10.9	B	0.0	11.5	B	11.5	B	0.0
Main Street/Parking Lot Driveway[1]	N/A	N/A	3.2	A	3.2	N/A	N/A	3.9	A	3.9

Δ = Change in intersection delay
[1] Indicates a one-way or two-way Stop Controlled Intersection. Delay and LOS are for stopped approach (worst).
Source: Wilson & Company, Inc., Engineers & Architects; June 2009

As shown above, all intersections are projected to continue to operate at acceptable LOS under Near-Term plus Project Construction conditions.

Near-Term plus Project Construction - Intersection Lane Vehicles Analysis

The Intersection Lane Vehicles analysis results for the SR-58 ramp junctions under Near-Term plus Project Construction conditions are displayed in Table 3.13-7.

Table 3.13-7: Ramp Junction Capacity Analysis: Near-Term Base plus Project Construction

Ramp Intersection	Peak Hour	Intersection Lane Vehicles/Hour	Description
Main Street/SR-58 NB Ramps	AM	642	*<1200: (Under Capacity)*
	PM	577	*<1200: (Under Capacity)*
Main Street/SR-58 SB Ramps	AM	521	*<1200: (Under Capacity)*
	PM	556	*<1200: (Under Capacity)*

Source: Wilson & Company, Inc., Engineers & Architects; June 2009

As shown above, both signalized freeway ramp junctions were determined to be "under capacity" under the Near-Term Base plus Project Construction conditions.

Neither the construction nor the operational phase of the AMSP and Lockhart Substation would have adverse impacts to the local or regional roadway network. The Lockhart Substation would be an unstaffed facility; no personnel would be assigned to the station for daily operations.

Railroad Crossings

Two, at-grade railroad crossings exist in the AMSP/Lockhart Substation area: one is located on U.S. Highway 395 and one is located on SR-58. Construction vehicles using these two highways will increase the volume of vehicles at these two crossings and consequently increase the risk for potential train/vehicle collisions. Construction traffic associated with the AMSP/Lockhart Substation represents a small percentage of the daily traffic volumes on U.S. Highway 395 and SR-58 (e.g., less than 7% of the daily volume on SR-58), and by itself would not significantly contribute to the risk. However, this project, in combination with other simultaneous construction projects could cumulatively contribute to a substantive increase in this risk. Refer to Chapter 4, Section 4.4.13 for further analysis.

3.13.3.1.2 Telecommunication System

Existing, and in some cases new, dirt access roads to the existing transmission line ROWs would be used to access the poles for stringing new fiber-optic cables, and installing new poles or trenching (refer to Table 2-2 for anticipated new access road assumptions). The anticipated workforce for the cable construction is provided in Appendix F. The amount of traffic anticipated for all of the fiber-optic installation is minimal compared to the trips projected for the AMSP construction. The telecommunication system construction would require an average of four personnel for each of the three fiber-optic cable routes. Since impacts to local roadways for the AMSP was determined not to be adverse, short-term construction trips from fiber-optic installation would not be adverse, with a much reduced trip generation. Routine maintenance would require periodic trips to check on fiber-optic lines, but traffic associated with those trips is considered negligible.

3.13.3.2 No-Action Alternative

Under the No-Action Alternative, DOE would not issue Mojave Solar a loan guarantee for construction of the AMSP, and Mojave Solar would not proceed with the proposed Project. Absent the proposed Project, traffic levels in the area would remain relatively constant and planned or programmed roadway improvements in the area would still occur.

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4.0 CUMULATIVE EFFECTS

The term "cumulative effect" is defined in Council on Environmental Quality regulations as "the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7).

This chapter defines the area the U.S. Department of Energy considered in the cumulative effects analysis, provides an overview of relevant past and present actions in the Abengoa Mojave Solar Project (AMSP)/Lockhart Substation and telecommunication system vicinity, presents the reasonably foreseeable actions in the area of consideration based on information from local planning agencies and the availability of documentation for future projects, and concludes with the cumulative effects analysis.

4.1 Area of Evaluation

The area of interest for potential cumulative projects includes the surrounding geographical area to the proposed Project within other parts of unincorporated San Bernardino County, as well as in and around neighboring cities including Barstow, Adelanto, and Victorville. Barstow, in particular, was included in part for cumulative impacts related to traffic and transportation due to the project's plan to bus construction employees from a park-and-ride location in Barstow. Additionally, a broader area was included when analyzing socioeconomic impacts since the proposed Project will draw from a larger labor pool geographically and influences areas beyond the areas near the project study area. A detailed discussion in each resource area describes the relevant cumulative projects as they relate to potential cumulative impacts.

4.2 Past, Present, and Reasonably Foreseeable Future Actions

As described in Section 3.1, past and present actions in the proposed AMSP/Lockhart Substation project vicinity consisted of irrigated agriculture, support agricultural operations, and rural residences with a transition to solar power generation and energy transmission. The telecommunication system is proposed to be located along existing utility corridors. The existing utility corridors traverse rural and open desert land; suburban and developed areas within unincorporated San Bernardino County; and the cities of Adelanto, Barstow, and Victorville.

Additional past and present actions that have influenced the project vicinity include residential, commercial, and light industrial projects. Residences within the vicinity of the AMSP/Lockhart Substation are sparse and mostly associated with rural residential. Past and present actions include the active agricultural area where the AMSP/Lockhart Substation are located and then the abandonment of the agricultural operations.

A review of the San Bernardino County Planning Department website and discussions with staff during the California Energy Commission (CEC) Application for Certification process for the

AMSP showed that there were no open applications for development projects within a 6-mile radius of the AMSP site. However, one project was identified just outside that radius (Nursery Products Sludge Plant – 7 miles) that was considered potentially relevant to traffic and transportation studies. Therefore, the Nursery Products project is included in the list of cumulative projects below.

A review of the CEC siting website was conducted to identify potential cumulative projects. A number of projects were identified, as noted in Table 4-1, and included in this analysis.

Table 4-1: Cumulative Project List

Project Name		Description of Project	Size/Location	Status
A	Barstow Sanitary Landfill	284-acre expansion of existing landfill	284 acres in CDCA, 3 miles south of Barstow east of Highway 247	September 2009 FEIR
B	Kramer Junction Solar Project	20-megawatt (MW) PV solar field	191 acres near the intersection of SR-58 and Highway 395	April 2010 MND
C	Daggett Ridge Wind Farm	33 turbines on a combination of 1,577 acres of BLM and 380 acres of private land; project would generate approximately 82.5 MW	1,577 acres of BLM and 380 acres of private land south of Highway 40 and east of Highway 247 in the community of Daggett	November 2009 EIS/EIR
D	Granite Mountain Wind Energy Project	28 turbines on a combination of 2,080 acres of BLM and 670 acres of private land; 84-MW project	2,080 acres of BLM and 670 acres of private land northwest of Lucerne Valley	April 2010 NOA Draft EIS/EIR
E	Lightsource Renewable Solar Project	40-MW solar photovoltaic project	350 acres southwest of the Kramer Substation and north of Edwards Air Force Base	March 2010 NOA
F	Hawes Composting Facility (Nursery Products LLC)	Composting of green waste and biosolids to produce agricultural compost	80 acres west of Hinkley and south of SR-58	November 2009 FEIR
G	SR-58 Upgrade	Caltrans proposes to upgrade and realign 10 miles of two-lane highway to four-lane divided freeway/expressway: Hidden River Road to Lenwood.	West of Hinkley along SR-58	EIS initiated in 2007. Draft is still in progress and not available. Letter summarizing public scoping concerns was reviewed.
H	Hacienda at Fairview	The proposed project is a mixed-use community of residential, commercial, and open space land uses, which generally consists of using a variety of resources (i.e.,	Northeast of the town of Apple Valley in Fairfield Valley; two parcels 440 acres and 1,115 acres	Draft EIR 2009

Project Name		Description of Project	Size/Location	Status
		labor, materials, necessary tools, equipment) to install and construct the community components (i.e., houses, roads, storm drain, utility services, sewage, etc.).		
I	Silverlakes Parkway & Clipper Lane LLC	The project is the planned development of 1,228 residential units and an 8-acre park on 262 acres of land.	The 262-acre project is located on the east side of Monterey Road between Horseshoe Road and Lakeview Road in the community of Helendale.	Initial Study 2007; assumed to be on hold
J	Tortilla-Coolwater Fiber Optic Line	Approximately 10 miles of new fiber-optic line placed on existing transmission poles	Similar in nature to the proposed Project's fiber-optic communications cable	Environmental Study is under way and the SF-299 permitting is currently under review by the BLM

CDCA = California Desert Conservation Area
MND = Mitigated Negative Declaration
NOA = Notice of Availability
PV = photovoltaic

4.3 Projects Excluded from the Cumulative Effects Analysis

Several projects have been identified through local- and state-level planning and permitting applications available to the public. They are included in this analysis for consistency and completeness. However, for many of the projects identified in this section, the planning process commenced under very different economic conditions than those that currently exist. As a result, some of these projects are now on hold indefinitely and therefore are no longer "reasonably foreseeable." In addition, one solar project and one wind farm project initially considered were omitted since the project applicants have cancelled their applications (Optisolar's 585 MW PV solar project and the Horizon Wind Energy project).

4.4 Reasonably Foreseeable Future Actions Included in the Cumulative Effects Analysis

As noted above, the County of San Bernardino website, CEC siting website, and communication with other local cities were used to develop the cumulative project list, summarized in Table 4-1. The location of these projects can be seen in Figure 4-1; the letter identification in Table 4-1 corresponds to the letters in the figure.

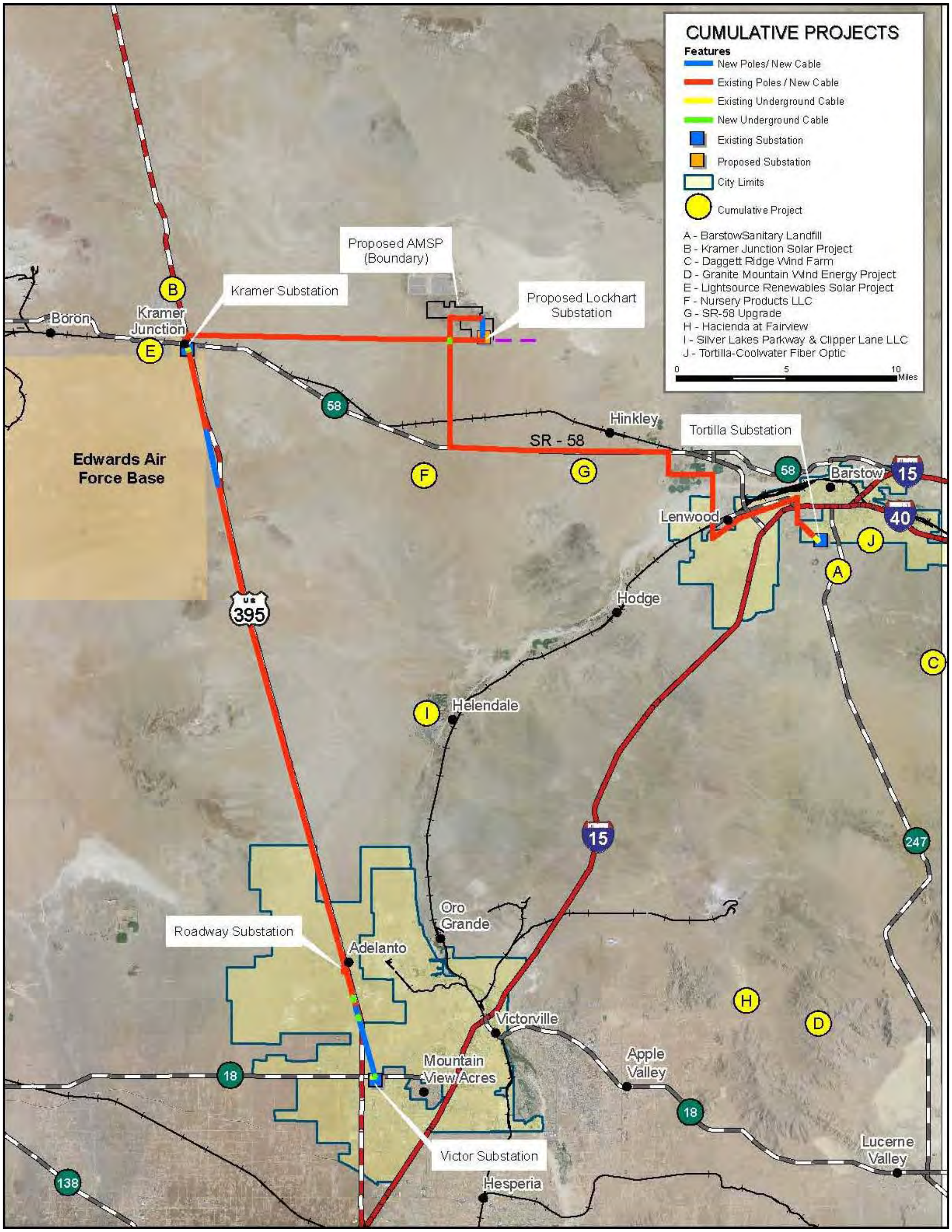

Figure 4-1: Cumulative Projects

4.5 Cumulative Effects Analysis

4.5.1 Land Use

As noted in Section 3.1, the proposed Project would not result in any substantive adverse land use conflicts. This project was considered in combination with the cumulative projects listed in Table 4-1 to determine if these new land uses would result in a cumulatively substantive impact or conflict with existing and planned land uses in the region, or with farmlands. Land use impacts were dismissed in the Initial Study for the Barstow Sanitary Landfill since there was no identified potential for a land use conflict. Land use impacts to farmlands from the Kramer Junction Solar Project and Daggett Ridge Wind Farm were not on farmland, thus eliminating farmland impacts. The Granite Mountain Wind Energy Project would require a conditional use permit from the County of San Bernardino and is partially located within an Area of Critical Environmental Concern. The conditional use permit requires compliance with conditions of approval and implementation of resource best management practices. Potential impacts to resources within the Area of Critical Environmental Concern were mitigated. No other land use impacts were found to be adverse. The Lightsource Renewable Solar Project is not located on farmlands and was consistent with general plan land use policies. No substantive adverse land use impacts were identified for the Hawe's Composting Facility. Information on the SR-58 Upgrade is unavailable at this time. The Hacienda at Fairview mixed-use project was found to have no substantive adverse land use impacts. The project was consistent with the County General Plan and is not located on farmlands. The Silverlakes Parkway & Clipper Lane project was originally applied for in 2007; no activity has occurred since and no environmental data are available despite the fact the project is listed on the County website. The Tortilla-Coolwater fiber-optic line is being evaluated by Southern California Edison. While no environmental data are available to the public at this time, the impacts from that project are expected to be similar in nature to the fiber-optic lines proposed for the proposed Project. No substantial adverse land use impacts are identified for the proposed Project; the fiber-optic lines are proposed to be strung on existing transmission lines within existing utility right-of-way. In summary, no adverse cumulative land use impacts are identified when taking the list of cumulative projects into consideration with the proposed Project impacts.

4.5.2 Visual Resources

Although development of the AMSP and Lockhart Substation would result in changes to the visual character of the landscape through the introduction of the solar facility and new substation, the incremental visual impact from Abengoa Mojave would be minor since the AMSP is located adjacent to an existing solar facility. In addition, the existing visual setting has already been modified from its natural state due to existing agricultural, transportation, and utility elements in the built environment.

Other wind and solar projects in the vicinity of the AMSP could contribute to a cumulative impact on visual resources. Of all the renewable energy projects listed, visual data were only available for the Kramer Junction solar plant, Granite Mountain Wind Energy Project, and the

Lightsource Solar Project. It was concluded that the Kramer Junction plant would not be visible from many areas easily accessible to the public, is adjacent to an existing large-scale solar thermal plant, and is on flat land in an area with few viewers. Potential glare impacts are not expected to be substantively adverse. No substantial adverse visual impacts were identified. The Granite Mountain Environmental Impact Statement concluded no significant visual effects. That project is located east of Apple Valley, a significant distance from the AMSP. The closest proposed Project element is the southern portion of the Kramer to Victor fiber-optic cable; this project feature would not cumulatively contribute to a substantive visual impact in combination with the wind farm, located approximately 20 miles east of the substation. No adverse visual impacts were identified for the Lightsource Renewable Solar Project. That project is located west of the Kramer Substation and would not be in the same viewshed as the AMSP. The minor fiber-optic improvements in the vicinity of the Kramer Substation would not contribute cumulatively to the Lightsource Renewable Solar Project visual effects. The Daggett Ridge Wind Farm Notice of Preparation identified visual as a potential issue; however, no analysis data were available. That project is located southeast of Barstow and is not in the same viewshed at the AMSP; cumulative visual impacts would not be anticipated should that project move forward.

The Barstow sanitary landfill located south of Barstow would be raised approximately 145 feet from its current elevation and this height increase was determined to have a significant visual impact on Highway 247, which is eligible for the State Scenic Highway Program and is a designated scenic highway by the County of San Bernardino and the City of Barstow. That project is not located within the same viewshed as the AMSP. The proposed Hawe's Composting Facility project is located south of State Route 58 (SR-58) and could be considered for cumulative visual impacts given the "industrial" nature of the project and its proximity to the AMSP. However, that project is a low-profile design of a completely different nature than the AMSP. Motorists driving SR-58 might have very distant views of both projects but in two different directions (north and south). Combined, these two projects would not result in cumulatively adverse visual effects given their different viewsheds and low-profile nature. Other projects in the list, including road upgrades and mixed use/residential development, would have different visual characteristics, which were not considered for cumulative visual impacts.

4.5.3 Air Quality

The proposed Project is located in the Mojave Desert Air Basin, which is a moderate federal nonattainment area for 8-hour ozone and particulate matter less than 10 microns in diameter (PM_{10}). The Mojave Desert Air Basin is classified as a state nonattainment area for ozone, PM_{10}, and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$). The Mojave Desert Air Basin currently meets the federal and state standards for carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead and is classified as an attainment area for these pollutants.

As discussed in Section 3.3, the estimated annual emissions of volatile organic compounds, nitrogen oxides, and PM_{10} from construction and operation of the proposed Project would be less than the annual *de minimis* levels. It is concluded that the proposed Project would conform to the State Implementation Plan. A State Implementation Plan is a comprehensive plan that describes how an area will attain the National Ambient Air Quality Standards (NAAQS) and includes a forecast of foreseeable emissions in the area. By complying with the State Implementation Plan, the proposed Project would not contribute to new violations of standards for ambient air quality, increase the frequency or severity of existing violations, or delay timely attainment of the 8-hour ozone and PM_{10} standard.

As described in Section 3.3, the proposed Project would not create new exceedances or contribute to existing exceedances for criteria air pollutants and precursors during construction. The proposed Project is located in a region with high background concentrations of PM_{10} that already exceed the state standard. The project's incremental contribution to the total impact is significantly lower than the background concentration itself and PM_{10} concentrations in the area would exceed the NAAQS even without these emissions. The background concentration is approximately three times the state 24-hour standard. Additionally, the contribution of the project's emissions would cease at the end of the construction period. Incorporation of CEC Conditions of Certification and Mojave Desert Air Quality Management District (MDAQMD) best available control technology requirements would further reduce the project's contribution to PM_{10} concentrations.

The project has been independently evaluated by both CEC and MDAQMD. CEC concluded that with implementation of staff's recommended control measures, described in the Conditions of Certification, all potential construction impacts associated with the AMSP will be avoided or minimized. The proposed AMSP would also have indirect emission reductions associated with the reduction of fossil-fuel-fired power plant emissions due to the AMSP displacing the need for their operation. In addition, CEC concluded that the AMSP portion of the proposed Project would comply with all applicable federal, state, and local laws, ordinances, rules, and regulations. Notable MDAQMD rules that the AMSP would comply with include Rules 401 (Nuisance), 402 (Visible Emissions), 403 (Fugitive Dust), and 1303 (New Source Review). Compliance with MDAQMD Rule 403 would ensure that dust emissions from the proposed Project would not be allowed to remain visible in the atmosphere beyond the property line of the emission source.

The AMSP and Lockhart Substation site would be the largest source of construction emissions. Construction of the interconnect transmission lines and telecommunication system would be a relatively minor source of construction emissions. Additionally, construction of the linear components of the proposed Project would proceed along the alignment and would not occur at the same location for more than a few days. There are no cumulative projects located within 2 miles of the AMSP site. The cumulative projects listed in Table 4-1 would be required to comply with all applicable MDAQMD rules and regulations and would obtain all applicable air permits, as appropriate. Thus, construction emissions from the proposed Project, along with construction emissions from cumulative projects, would be regulated. In addition, there would be no construction activities occurring at the same time within a 2-mile radius of the AMSP site. The proposed Project's construction emissions would comply with the SIP and would not impede MDAQMD's plans for NAAQS attainment. Therefore, given the short-term nature of construction activities, cumulative air quality impacts from construction emissions would not be likely.

Operational emissions associated with the proposed Project would primarily be from AMSP operation. Operation of the AMSP will result in emissions of criteria air pollutants from onsite sources such as the proposed auxiliary boilers, fire pumps, emergency generator engines, and cooling towers, and fugitive losses from the heat transfer fluid system; and mobile source emissions from project-generated traffic. As discussed above, the estimated annual operational emissions of volatile organic compounds, nitrogen oxides, and PM_{10} for the project would be less than the annual *de minimis* levels. The proposed Project would conform to the State Implementation Plan and would not impede MDAQMD's efforts for NAAQS attainment. The project's operational modeling analysis indicates that, with the exception of California Ambient Air Quality Standards (CAAQS) 24-hour and CAAQS annual PM_{10} exceedances, the proposed Project would not create new exceedances or contribute to existing exceedances for any of the modeled air pollutants. The proposed Project is located in a region with high background concentrations of PM_{10} that already exceed the state standard. The contribution of the proposed Project's emissions to the total 24-hour PM_{10} impact is only 5%; that is, 95% of the impact is due to high background concentrations. The 24-hour PM_{10} background concentration is three times the CAAQS by itself. The project's incremental contribution to the total impact is significantly lower than the background concentration itself and PM_{10} concentrations in the area would exceed the NAAQS even without these emissions. Additionally, the worst-case PM_{10} impacts occur at the AMSP fence line and drop off quickly with distance from the AMSP fence line. Incorporation of CEC Conditions of Certification and MDAQMD best available control technology requirements would further reduce the project's contribution to PM_{10} concentrations.

The project has been independently evaluated by both CEC and MDAQMD. MDAQMD released its Final Determination of Compliance on May 13, 2010, stating that the project is expected to comply with applicable Air District rules, which incorporate state and federal requirements. MDAQMD issued a revised Final Determination of Compliance dated July 1, 2010, with revised permit conditions. MDAQMD concluded that since the background PM_{10} concentrations are substantially in excess of the CAAQS without the project and the new facility will not be a major stationary source per MDAQMD NSR Regulation XIII for any criteria pollutant, the project will comply with all applicable MDAQMD Rules and Regulations. In addition, the proposed AMSP facility would not be required to obtain offsets pursuant to MDAQMD Rule 1303. The AMSP would not trigger the Prevention of Significant Deterioration program requirements; therefore, a Prevention of Significant Deterioration increment analysis protocol is not required. The proposed Project would also comply with all best available control technology requirements of MDAQMD. Compliance with the District's new source review requirements would ensure that the proposed Project would be consistent with the strategies and future emissions anticipated under the District's air quality attainment and maintenance plans. MDAQMD's Final Determination of Compliance amounts to their approval of the project's permit application.

Thus, MDAQMD has independently reviewed the project's emissions and has concluded that it meets all their regulations.

In addition, CEC concluded that the operational impacts, when factoring in Conditions of Certification, would not contribute substantially to exceedances of the PM_{10} CAAQS. With the proposed District- and staff-recommended Conditions of Certification, the proposed Project's operating emissions would not have an adverse impact on air quality. Fugitive dust generated during operation of the proposed Project would be subject to MDAQMD Rule 403.

Half of the cumulative projects listed in Table 4-1 represent wind and solar energy projects that would displace emissions from fossil-fuel-based power plants and would generate minimal operational emissions. In addition, all cumulative projects would be required to obtain air permits from MDAQMD to prevent construction and operational emissions from exceeding applicable thresholds. In addition, renewable energy facilities, such as the proposed Project, are needed to meet California's mandated renewable energy goals. While there are no local area air quality public benefits resulting from the proposed Project, it would indirectly reduce criteria pollutant emissions within the southwestern United States by reducing fossil fuel-fired energy generation. The AMSP/Lockhart Substation site has served as an agricultural and cattle center for over 60 years. Currently, there are no ranching or residential activities on the property, and only one active pivot irrigation field is in production on the site. The site currently is a source of fugitive dust emissions and contributes to the background PM_{10} concentrations in the area. Operation of the proposed Project and implementation of the specified mitigation measures and Conditions of Certification would provide better control of fugitive dust onsite than is currently occurring. Thus, the project would help offset some of the PM_{10} contribution from the current site.

MDAQMD is currently classified as nonattainment for the state and the federal 24-hour PM_{10} air quality standard. MDAQMD first adopted a Federal Particulate Matter Attainment Plan on July 31, 1995. Currently, the vast majority of air districts in the state are designated nonattainment of the state PM_{10} standard. There is no legal requirement for air districts to provide plans to attain the state PM_{10} standard, so air districts have not developed such plans. The Particulate Matter Attainment Plan states that "(t)he air quality of the MDAQMD is impacted by both fugitive dust from local sources and occasionally by regionwide windblown dust during moderate to high wind episodes. This regionwide or 'regional' event includes contributions from both local and distant dust sources which frequently result in violations of the NAAQS that are multi-district and interstate in scope." It also states that "(i)t is not feasible to implement control measures to reduce dust from regional wind events." Therefore, the District would have put considerable effort to reduce the emissions from "…unpaved road travel, construction, and local disturbed areas in the populated areas, and certain stationary sources operating in the rural Lucerne Valley." As a solar power generation facility, the direct air pollutant emissions from power generation are negligible and the emission source would be limited to auxiliary equipment and maintenance activities. The emissions from the AMSP would be minimal compared to the other power generation facilities, and it is unlikely that the proposed Project would measurably contribute to ongoing air basin PM_{10} nonattainment exceedance events considering impacts from other sources.

Thus, the incremental increase in air emissions associated with operation of the proposed Project would not contribute to cumulatively adverse impacts to air quality.

4.5.4 Noise

Noise would be generated during the construction of each of the facilities primarily from the use of heavy construction equipment on the sites. Noise associated with delivery trucks would also be generated along each of the haul routes. Due to attenuation, noise levels during construction are greatest near construction sites and roadways, and noise levels drop off rapidly with distance from the noise source. Due to the widely dispersed nature of each of the sites, no cumulative noise impacts are anticipated during construction.

Operational noise would be generated from the Barstow Sanitary Landfill, Hawes Composting Facility, and the wind farms. Equipment at the landfill and composting facility would generate noise at the facilities and haul trucks would generate noise along the haul routes. Operational noise would be generated for the duration of activity at these facilities; however, cumulative operational noise effects are not expected since there are no sensitive receptors located near either facility.

In addition, noise would be generated by the turbine blades at the wind farms. Noise effects are greatest in the immediate vicinity of the wind turbines and diminish rapidly with distance; however, there could be minor increases in ambient noise levels near the wind farms. Given the large distances between the wind farms and other facilities and sensitive receptors, no cumulative noise impacts are anticipated.

4.5.5 Geology, Soils, and Seismicity

No projects are located in the vicinity of the AMSP and Lockhart Substation that could be considered for cumulative geology and soils impacts. However, any nearby projects would be expected to adhere to the appropriate professional standards and regulatory requirements. Because the AMSP and Lockhart Substation will be designed and constructed to meet all professional standards and regulatory requirements, the AMSP and Lockhart Substation would not be expected to contribute to cumulative effects on geologic resources and hazards during either construction or operation. The same is expected of each of the cumulative projects.

With the implementation of measures to control erosion and sedimentation, including standard construction practices and best management practices, the AMSP and Lockhart Substation would have minimal impacts on soils conditions. Other potential projects in the area would be required to comply with the same water quality-related regulatory programs (e.g., National Pollutant Discharge Elimination System permits and grading ordinances) and would be expected to control erosion under these regulations. Thus, the proposed Project would not contribute substantively to cumulative soils impacts in the general area that might result from other projects.

4.5.6 Paleontological Resources

Cumulative impacts can result from individually minor but collectively adverse actions taking place over a period of time. In general, for scientifically significant paleontological resources that may be present within the AMSP/Lockhart Substation and Telecommunication System area, the potential for the proposed Project to contribute to adverse cumulative impacts is low with the implementation of measures to avoid or salvage the resources. The measures incorporated into the analysis in Section 3.6 are also required for any project with the potential to encounter sensitive paleontological resources. Those measures will effectively recover the value to science and society of significant fossils, if any, that would otherwise be destroyed by surface-disturbing actions. No substantively adverse cumulative paleontological impacts are anticipated.

4.5.7 Water Resources

Water would be used during construction of all of the facilities for dust suppression and other activities. Construction phase water usage for the AMSP/Lockhart Substation is estimated to be between 59,800 and 1,766,050 gallons per day. Water use would be greatest during the grading phase of construction. Groundwater studies conducted for the AMSP indicate that the use of these volumes of water would not impact groundwater availability or quality. When combined with the construction phase water use of the other nearby projects, there could be a minor cumulative impact on groundwater.

Operational phase water use would be associated with the AMSP, sanitary landfill, Hawes Composting Facility, and the residential and mixed-use developments. Of these projects, the AMSP would have the highest ongoing groundwater use; however, the groundwater studies conducted indicated that the AMSP would not result in substantively adverse impacts on water resources. The AMSP is projected to have a peak water use of 2,160 acre-feet per year, substantially lower than the projected water demand of continued agriculture on the AMSP/Lockhart Substation site. Continued agriculture would require between 6,500 and 18,000 acre-feet per year. The Hawes Composting Facility is expected to use just over 1 acre-foot of groundwater per year. The solar facilities and the landfill would use water trucked in from local suppliers and the cumulative impacts on water resources are expected to be minor. The proposed Project would result in a beneficial impact on water use and would therefore not contribute to an adverse effect on water supplies.

4.5.8 Biological Resources

The geographic scope for considering cumulative biological impacts cannot by defined by jurisdictional or other political boundaries, as sensitive habitats and species can have widespread ranges and can vary for individual species. For this reason, the biological cumulative impact analysis includes much of the desert region in San Bernardino County.

The proposed Project would be implemented in an area that contains habitat for desert tortoise, Mohave ground squirrel, and western burrowing owl, along with a range of other sensitive and common species, including migratory species protected under the Migratory Bird Treaty Act and the golden eagle which is protected under the Bald and Golden Eagle Protection Act. Other projects in the region, such as transmission line projects, solar plants, wind farms, mixed-use development, and other infrastructure projects, affect these species to varying degrees depending on their location and magnitude. The proposed Project would permanently remove a relatively small amount of habitat for these species in an area that is considered to be of high habitat value for tortoise, Mohave ground squirrel, and western burrowing owl. However, measures have been proposed that would compensate for the loss of habitat and limit potential direct and indirect impacts and reduce potentially adverse effects. A number of federal and species-specific plans and guidelines were reviewed to determine not only project impacts, but to ensure compliance with these plans which are put into place to protect federally listed threatened and endangered species on a cumulative, regional level. With the proposed Project's implementation of regional, species-specific protection measures (such as those for tortoise, Mohave ground squirrel, and western burrowing owl from the West Mojave Plan), the project's contribution to cumulative sensitive wildlife species impacts would be minimal.

Compensation lands have also been set aside by the projects within the region for the preservation of the desert tortoise and other species. For these reasons, implementation of the proposed Project would have incremental impacts on biological resources in this area, but those impacts would not be cumulatively considerable with the implementation of the measures identified for potential proposed Project impacts.

4.5.9 Cultural Resources

Because the proposed Project will not result in any adverse cultural resources impacts and no Historic Properties would be adversely affected, it will not incrementally contribute to significant cumulative impacts associated with other past, present, or planned projects.

4.5.10 Socioeconomics

The potential for cumulative socioeconomic impacts exists where there are multiple projects proposed in an area that have overlapping construction schedules and/or project operations that could impact similar resources. Projects with overlapping construction schedules and/or operations collectively could result in a demand for labor that cannot be met by the proposed Project area labor pool, which could lead to an influx of nonlocal workers and their dependents. This population increase could impact socioeconomic resources (e.g., housing, schools, public services, etc.).

Ten cumulative projects have been identified, all located within a 1-hour drive of the AMSP/Lockhart Substation site. Estimated average construction workers per day for each project ranges substantially by project. Even if some overlap occurs in construction schedules among the AMSP/Lockhart Substation and telecommunication system and the other projects, all projects would be expected to draw on the large regional construction workforce in Southern California. It should also be noted that the labor pool required for the construction of the solar facility is specialized and would not typically include laborers from the general commercial and residential construction pool. Should these all be constructed simultaneously, and there is currently no indication this will happen based on the status of projects noted in Table 4-1, a large influx in construction labor to the area could create demand for temporary housing that is greater than the existing supply. It was assumed that few, if any, construction workers would permanently relocate to the communities near the AMSP/Lockhart Substation site during the construction phase. This is because construction workers typically commute relatively long distances to their work sites. Should some construction workers choose to stay temporarily at a local area motel or hotel, there is ample transient housing in the 60-mile radius surrounding the AMSP/Lockhart Substation site. There are about 2,400 hotel/motel rooms and suites among 34 different establishments in the area surrounding Barstow, California City, and Mojave, with extensive additional available temporary housing in the communities within 2 hours of the proposed Project site. Additional housing opportunities are available in the form of recreational vehicle and mobile home sites.

Project construction and operation are not expected to lead to more than minimal population immigration (construction workers and families) and the operation of the AMSP would contribute positively to the local economy, e.g., through increased property and sales tax revenues. The proposed Project would not be expected to contribute substantially to adverse cumulative socioeconomic impacts during either its construction or operations phase.

4.5.11 Environmental Justice

In the context of the siting of a solar plant, the primary environmental justice issue would be potential air or water emissions that could adversely affect the health of these populations. Other issues could include potential residential or business displacements, and noise impacts on populations near the plant or ancillary facilities. However, the proposed Project would not result in substantively adverse air quality impacts or impacts to surrounding communities from emissions of hazardous air pollutants. The proposed Project would also not involve wastewater discharges that could affect drinking water supplies. Because of the project design features and the distance of sensitive receptors from the proposed power islands, there would be no substantively adverse noise impacts. The proposed Project would not displace any homes or businesses. In light of these findings, the rural and remote character of the area, and the low population concentration near the proposed Project, disproportionate impacts on low-income and minority populations present in the area around the AMSP and ancillary facilities are not anticipated.

4.5.12 Public Health and Safety

No substantial public health effects are expected during the construction phase of the AMSP. Construction of the AMSP and other facilities would generate limited amounts of hazardous and solid wastes and would require the limited use of hazardous materials such as fuels, lubricants, and cleaning solvents. Normal use of hazardous materials and compliance with hazardous materials regulations would minimize potential impacts to public health. These same standards in practice would be required on any of the cumulative projects and enforced by permits and monitoring.

To the extent that nearby projects are constructed simultaneously, there could be minor cumulative effects on emergency response and fire protection. In addition, the additive effect of multiple simultaneous construction projects could have a cumulative effect on road and highway safety due to the increase of heavy trucks transporting equipment and materials to each of the construction sites and the composting facility. Overall, the potential impacts on public health and safety would be minor. (Refer to Transportation for potential safety risks associated with at-grade railroad crossings.)

4.5.13 Transportation

Neither the construction nor the operational phase of the AMSP and Lockhart Substation would have adverse impacts to the local or regional roadway network, as summarized in Section 3.13. The primary impacts to transportation would be during the construction phase of the proposed Project. To the extent that other projects in the vicinity were constructed simultaneously, there could be minor cumulative impacts to intersections or the roadway network particularly during peak commute periods, or during deliveries of construction materials or equipment. Given the short-term nature of construction activities for all of the nearby projects, these impacts would be minor. Traffic control plans would help minimize the short-term disruption to local commuters.

As noted in Section 3.13, two, at-grade railroad crossings exist in the AMSP/Lockhart Substation area: one is located on U.S. Highway 395 and one is located on SR-58. Construction vehicles using these two highways will increase the volume of vehicles at these two crossings and consequently increase the risk for potential train/vehicle collisions. While construction traffic associated with the AMSP/Lockhart Substation represents a small percentage of the daily traffic volumes on U.S. Highway 395 and SR-58 (e.g., less than 7% of the daily volume on SR-58), the proposed Project would contribute to the cumulative increase in risk. Most of the projects listed in Table 4-1 would not utilize SR-58 as a haul route, other than the Hawes Composting Facility, and the SR-58 Upgrade project. However, the SR-58 upgrade is still under review so it is difficult to ascertain whether their construction phase would overlap with the proposed Project. Should these two projects be constructed simultaneously, the number of truck trips along this route could necessitate a specific traffic control plan focused on rail road safety. Cumulative construction traffic on U.S. Highway 395 would be considered a small percentage of the average daily traffic on this highway and would not be considered a substantive contribution to any existing railroad crossing risks.

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The CEC AFC studies utilized in the preparation of this EA are referenced in Chapter 7, References. The authors and technical experts responsible for the individual AFC studies are incorporated by reference to those studies.

6.0 LIST OF AGENCIES AND NATIVE AMERICAN TRIBES CONTACTED

Agencies

U.S. Fish and Wildlife Service
U.S. Army Corps of Engineers
U.S. Department of the Interior, Bureau of Land Management, California State Office and Barstow Field Office
California Department of Fish and Game
California Public Utilities Commission

Native American Tribes

Chemehuevi Reservation
Morongo Band of Mission Indians
San Manual Band of Mission Indians
Twenty-Nine Palms Band of Mission Indians
Colorado River Indian Tribe
Fort McDowell Yavapai Nation
Kaiband Band of Paiute Indians
Las Vegas Tribe of Paiute Indians
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Paiute Indian Tribe of Utah
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7.0 REFERENCES

As noted in the EA, a significant portion of this analysis incorporated technical data and reports that were prepared for the Mojave Solar Project CEC AFC. The AFC analyses were incorporated by reference into this report; however, the references used are included in this section for purposes of tracking source data. Those references follow the EA references below.

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