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DRAFT BIOLOGICAL ASSESSMENT
MOJAVE SOLAR PROJECT

San Bernardino County, California

Township 11N, Range 4W, Sections 28 through 30, 32, and 33

Prepared for:

Mojave Solar, LLC
Contact Person: Scott Frier
Phone Number: (760) 962-9200

Prepared by:

AECOM
1420 Kettner Boulevard, Suite 500
San Diego, California 92101
Phone: (619) 233-1454
Fax: (619) 233-0952

Lyndon Quon, Senior Biologist

April 2010

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1.0 INTRODUCTION

The purpose of this Biological Assessment (BA) is to evaluate the potential effects of the Mojave Solar Project (MSP or Project) to species listed as endangered or threatened under the federal Endangered Species Act (ESA), or their designated critical habitat. The Proposed Federal Action is the issuance of a loan guarantee by the U.S. Department of Energy (DOE) for the purpose of construction and operation of the MSP and installation of a fiber optic line by Southern California Edison (SCE) to support the MSP. The MSP is being proposed by Mojave Solar, LLC (MSLLC), with the DOE providing initial funding for the Project through the federal loan guarantee process. Therefore, the DOE is acting as the federal action agency for the MSP, which includes proposed compensation for impacts to species listed under the ESA.

The MSP involves the construction and operation of a new solar power facility that would be located in unincorporated San Bernardino County, California, in the Mojave Desert, approximately 90 miles northeast of Los Angeles, between Barstow and Kramer Junction, approximately 9 miles west of Hinkley, California (see Figure 1). The approximate 1,765-acre Project site is vacant and significantly disturbed from past and current agricultural activities. Approximately 128 acres of land is currently farmed on the Project site. Agricultural operations will discontinue once construction begins. The site topography is very planar, with elevations ranging from approximately 2,025 to 2,105 feet above mean sea level (amsl), and ideal for the development and operation of a solar-thermal energy generating facility. Electricity generated by the plant would be distributed to transmission lines owned and operated by Southern California Edison (SCE), specifically, the existing Coolwater–Kramer No. 1, 220-kilovolt (kV) transmission line. The MSP Interconnection System Impact Study (ISIS) was completed in coordination with the California Independent System Operator (CAISO) and is located in Appendix N of the MSP Application for Certification (AFC). The Interconnection Facilities Study (IFS) is in progress to detail the on-the-ground system-wide improvements; as a separate process, SCE is leading the permitting effort for the transmission improvements beyond the Project-specific interconnection to the Statewide system.

SCE proposes to construct the Lockhart Substation and associated facilities to interconnect the MSP to the Coolwater–Kramer 220-kV line and various substations in the region that is the subject of this analysis. The new Lockhart Substation is proposed to be located within the footprint of the MSP site, as would the associated generation tie line connections and the distribution line for the substation's light and power. However, a portion of the interconnection to the 220-kV line, the proposed "transmission line loop," would be located partially outside the limits of the MSP boundary and within the existing SCE right-of-way for the Kramer to Coolwater 220-kV line. Additionally, the proposed telecommunication system between the

Lockhart Substation and the various substations in the region would require new fiber optic cables. The proposed fiber optic cable routes fall outside the limits of the MSP boundary and are also addressed in this analysis.

The Project site is located immediately south of an existing solar power plant developed in the late 1980s and early 1990s and owned and operated by Florida Power and Light (FPL). This adjacent plant site is known as the Harper Lake Solar Electric Generating Station (SEGS VIII and IX), and is referred to hereafter as SEGS. The land on which the Project is proposed to be constructed was originally the site in the 1990s of the proposed Solar Electric Generating Stations XI and XII, which were never built. The Lockhart Substation and some of the associated interconnection facilities are proposed to be located within the limits of the MSP. The proposed transmission line loops to the Kramer to Coolwater 220-kV south of the MSP boundary into an existing SCE transmission line right-of-way. The three proposed telecommunication lines extend from the Lockhart Substation in a southeast direction, directly west and southwest, and are designated as the Lockhart to Tortilla Substation Fiber Optic Line, the Lockhart to Kramer Substation Fiber Optic Line, and the Kramer to Victor Substation Fiber Optic Line.

The MSP has the potential to impact the desert tortoise (*Gopherus agassizii*) (DT), Mojave Desert Population, which is listed as threatened under the ESA. Early coordination and pre-consultation with the U.S. Fish and Wildlife Service (Service) was conducted as described in Section 2. This BA addresses the MSP and the Proposed Federal Action in compliance with Section 7 of the ESA. Section 7 assures that, through consultation (or conferencing for proposed species) with the Service, federal actions do not jeopardize the continued existence of any threatened, endangered or proposed species, or result in the destruction or adverse modification of critical habitat. This BA is prepared in accordance with legal requirements set forth under Section 7 of the ESA (16 U.S. Code [U.S.C.] 1536 [c]) and DOE regulations. The purpose and need of the MSP is described in detail in Section 3.

2.0 CONSULTATION TO DATE

The consultation history includes communications between MSLLC and DOE, and informal discussions with staff from the Ventura, California, office of the Service. The following is a chronology of the events and processes leading up to the preparation of this BA:

1. November 6, 2009: DOE contacted MSLLC, requesting Part II of the federal loan guarantee application, including an environmental report to be used by DOE to determine compliance with the National Environmental Policy Act (NEPA). MSLLC

decided to pursue the federal loan guarantee process as the federal nexus for ESA Section 7 consultation.

2. April 8, 2009: MSLLC attends a meeting of the California Renewable Energy Action Team (REAT) in Sacramento, California. Rick York of the California Energy Commission (CEC) stated that CEC would work with DOE on the ESA Section 7 consultation process, as well as general ESA compliance issues. Ashleigh Blackford of the Service's Ventura Office stated that if the Section 7 consultation process was not available for the Project, then a Section 10 Low-Effect Habitat Conservation Plan (LEHCP) process could potentially be prepared for ESA compliance.

3. April 28, 2009: In a telephone conversation between Chris Ellison and Shane Conway (legal counsel representing MSLLC on the MSP), with Paul Richins (CEC), Mr. Richins agrees that ESA Section 7 consultation between DOE and the Service would be desirable, and that CEC would work with DOE to facilitate coordinating the consultation process.

4. July 2, 2009: In a telephone conversation and email correspondence between Chris Ellison, Shane Conway, Kim McCormick, Dennis Beck (CEC Senior Staff Counsel), and Christine Hammond (CEC Office of Counsel), a joint permitting timeline was drafted regarding the coordination of the CEC permitting process, and the DOE ESA Section 7 consultation process with the Service.

5. July 22, 2009: MSLLC attends REAT meeting at the CEC, with Ashleigh Blackford (Service) and Tonya Moore California Department of Fish and Game (CDFG) in attendance via conference call. Dennis Beck and Christine Hammond stated that they had spoken with Vicky Campbell (Service) and Matthew McMillan (DOE) regarding the applicability and availability of the ESA Section 7 consultation process for the Project, and that a concurrent process between the CEC, DOE, and Service was being worked out. At this meeting, the MSLLC team presented a proposed compensation strategy to offset Project effects to species, including the federally listed threatened desert tortoise. Ms. Blackford did not express any concerns over the proposed compensation (see detailed discussion under "Description of the Proposed Action, Compensation Lands").

6. December 2009: MSLLC submits the Draft Biological Assessment to DOE and USFWS for initial technical review.

7. March 2010: DOE and USFWS provide technical guidance for revisions to the Draft Biological Assessment, including the decision to include the SCE telecommunications upgrade components to the Proposed Action.

3.0 DESCRIPTION OF PROPOSED ACTION AREA

3.1 Action Area

The Action Area is defined as all areas to be affected directly or indirectly by the MSP and the SCE fiber optic lines, and not merely the immediate area involved in the Project (50 Code of Federal Regulations [C.F.R.] §402.02). The Action Area for the Project is composed of the:

- Project Area, which is approximately 1,765 acres in unincorporated San Bernardino County, California, located approximately 9 miles west of Hinkley, California (Figures 1, and 2a);[1]
- SCE Lockhart Substation and associated transmission interconnection facilities (Figures 1 and 2a);
- SCE fiber optic cable lines outside of the MSP boundary, downstream of the Lockhart Substation and transmission interconnection (Figures 1 and 2b through 2d); and
- Compensation Lands, which currently include a 647-acre parcel proposed for compensation (Figure 6) to offset any potential adverse effects on the federally listed threatened Mojave population of the desert tortoise (DT).

The construction and operation of the MSP solar facilities are contained within the Project Area and surrounded by the Project Area boundary. The proposed SCE telecommunication lines—consisting of fiber optic cables that would be strung on existing poles or new poles, or placed in new or existing underground conduits—are confined to three routes extending from the Lockhart Substation, and continue outside of the MSP Project Area and the Lockhart Substation, primarily

[1] Details of the parcels included as part of the project are as follows:
- S ½ of Section(Sect.) 30, Township(T)11North(N) Range(R)4West(W), San Bernardino Meridian (SBM),
- S ½ of NW ¼ of Sect. 30, T11N R4W, SBM,
- SW ¼ of the NE ¼ of Sect. 30, T11N R4W, SBM,
- S ½ of Sect. 29, T11N R4W, SBM,
- SW ¼ of NW ¼ of Sect. 29, T11N R4W, SBM,
- W ½ of SW ¼ of Sect. 28, T11N R4W, SBM,
- NE ¼ of SW ¼ of Sect. 28, T11N R4W, SBM,
- W ½ of SE ¼ of SW ¼ of Sect. 28, T11N R4W, SBM,
- NE ¼ of Sect. 32, T11N R4W, SBM, and
- Sect. 33, T11N R4W, SBM.

The Project Site's Assessor's Parcel Numbers (APN) 0490-121-42, include: APN 0490-131-06, APN 0490-131-07, APN 0490-131-08, APN 0490-131-11, APN 0490-131-12, APN 0490-131-15, APN 0490-131-16, APN 0490-161-08, APN 0490-161-09, APN 0490-161-10, APN 0490-161-11, APN 0490-161-12, and APN 0490-161-13.

along previously disturbed transmission and distribution rights-of-way. The Compensation Lands are located west and outside the Project Area.

The Project Area and the proposed Compensation Lands consist of private parcels located within an unincorporated portion of San Bernardino County, California. While the Department of Interior, Bureau of Land Management (BLM), has jurisdiction over much of the area surrounding the site, no BLM land is included in the proposed Project site. For the SCE components of the Proposed Action, the Lockhart Substation and some of the associated interconnection facilities are proposed to be located within the limits of the MSP. The proposed transmission line loops to the Kramer to Coolwater 220-kV line immediately south of the MSP boundary into an existing SCE transmission line right-of-way. The proposed telecommunication lines—consisting of fiber optic cables that would be strung on existing poles or new poles, or placed in new or existing underground conduits—are confined to three routes extending from the Lockhart Substation in a southeast direction, directly west and southwest. Specifically, the Lockhart to Tortilla Substation Fiber Optic Line is located mostly within the County of San Bernardino and partially within the city limits of Barstow as the route nears the Tortilla Substation. The Lockhart to Kramer Substation Fiber Optic Line takes a westerly path, most of which follows the existing Lockhart 33-kV and Kramer to Coolwater 220-kV transmission line routes toward the Kramer Substation, also located within the County of San Bernardino. Finally, the Kramer to Victor Substation Fiber Optic Line traverses from north to south, mostly paralleling the west side of Highway 395 between the intersection of State Route (SR) 58/Highway 395 and Palmdale Road/Highway 395. This route is within unincorporated San Bernardino County and partially within the limits of the City of Adelanto.

3.2 Project Setting and Access

The MSP is located approximately 9 miles northwest of Hinkley, California, halfway between Barstow and Kramer Junction, California. Harper Dry Lake is located immediately northeast of the site and existing SEGS VIII and IX (SEGS), developed in the late 1980s and early 1990s, to the immediate northwest. The BLM Watchable Wildlife Area is also located northeast of the Project Area. Approximately six to eight residences are located to the southwest of the site, the majority of which are abandoned, and a ranch is located on site. The land to the south and southeast of the Project Area is vacant. Beyond the details described above, the land surrounding the Project, stretching as far as Hinkley, is vacant and largely undeveloped.

The Project Area is largely fallow agricultural land specifically sited and configured to minimize environmental impacts. The Project Area is significantly disturbed from past and current agricultural activities. Approximately 128 acres of land is currently farmed in the Project Area

and will discontinue once Project construction begins. The site topography is very planar and ideal for the proposed solar-thermal application, with elevations ranging from approximately 2,025 to 2,105 feet amsl.

MSP access is located approximately 20 miles west of Barstow along the SR 58 corridor. Harper Lake Road provides access to the site approximately six miles north of the intersection at SR 58 as shown in Figure 1, Regional Map.

Access to the SCE components of the Proposed Action are along existing access roads within the rights-of-way of the Kramer–Coolwater 220-kV line, the Lockhart 33-kV line, and Highway 395, as shown in Figure 1.

3.3 Project Overview

The MSP includes three distinct components:

- Construction of the proposed solar facility (solar fields, power blocks, etc.) and associated infrastructure (transmission interconnection, natural gas pipeline connection, roads, etc.).
- Operation of the Alpha and Beta facilities.
- Compensation for potential adverse effects to the desert tortoise.

The 1,765-acre Project Area includes the proposed plant site, transmission line and interconnection substation, drainage channels, access roads, storage areas, and parking zones (Figure 3). The Plant Site includes the Alpha site (the northwest portion of the Project Area) and the Beta site (the southeast portion of the Project Area), which will encompass 884 acres and 800 acres, respectively. Both sites will connect to a transmission line interconnection substation to form one full-output transmission interconnection.

The Project will implement well-established parabolic trough technology to solar heat a heat transfer fluid (HTF). This hot HTF will generate steam in solar steam generators (SSGs), which will expand through a steam turbine generator (STG) to produce electrical power with a combined net nominal electrical output of 250 megawatts (MW) from twin, independentlyoperable solar fields, each feeding a 125-MW power island. The sun will provide 100 percent (%) of the power supplied to the Project through solar-thermal collectors; no supplementary fossil-based energy source (e.g., natural gas) is proposed for electrical power

production. The Project is proposing interconnection with the Kramer–Coolwater 230-kV transmission line, which is owned by SCE and located adjacent to the southern border of the Project.

The SCE components consist of several key components:

Lockhart Substation: A new 220-kV substation is proposed to loop-in the existing Kramer–Coolwater No. 1, 220-kV transmission line and provide two 220-kV line positions to terminate two new 220-kV generation tie lines (gen-ties) owned by MSLLC.

Transmission Lines: The 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.

Generation Tie Line Connections ("gen-ties"): The Project includes the connection between two gen-tie lines associated with the MSP and the proposed Lockhart Substation. This work involves construction of two single spans of conductors between the Lockhart switchrack and MSP-owned towers.

Distribution Line for Station Light and Power: The 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 MSP. In addition, a range of 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.

Telecommunications Facilities: The 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, constructing new poles, placing segments of cable in existing underground conduit, and placing cable in new underground conduit. A total of 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 MSP interconnection, and provide communications redundancy at the two MSP power blocks.

3.4 Project Purpose and Need

The Project is expected to supply renewable energy to the California energy market. The objectives, purpose, and need of the MSP are as follows:

- To help achieve the State of California renewable energy objectives and to support the State's electric utility requirements with the long-term production of renewable electric energy;
- To safely and economically construct, operate, and maintain an efficient, reliable, and environmentally sound power-generating facility;
- To develop a Project using up-to-date and improved versions of an already-proven renewable energy technology, minimizing technical risk and improving the financial viability of the Project;
- To maximize the renewable energy from a site with an excellent solar resource, appropriate slope and grading, availability of water rights, and availability of transportation and other infrastructure in order to minimize the cost of renewable energy for consumers;
- To reduce or eliminate potentially significant adverse environmental impacts by locating away from sensitive noise and visual receptors and sensitive species;
- To electrically interconnect to suitable electrical transmission while minimizing environmental impacts associated with interconnection and minimizing cost; and
- To develop a site with close proximity to natural gas infrastructure in order to minimize environmental impacts and cost.

3.5 Project Features

3.5.1 Solar Power Generation Facilities

The following section describes the proposed Project plant site arrangement and the processes, systems, and equipment that constitute the power plant. Note that the generating facilities described in this section, along with the associated construction/operating footprint, all occur within the approximately 1,765-acre plant site Project Area boundary depicted in Figure 3, Project Vicinity.

Figure 3, Facilities Layout, shows the layout of proposed Project facilities, which consist of the following:

- Overall Project area and facilities footprint;
- Two separate power island areas, one each for the Alpha and Beta areas;
- Construction laydown and solar collector assembly building 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 area;
- Onsite gas pipeline facilities with connection point to existing pipeline;
- Drainage improvements to convey offsite storm water around the Project;
- Groundwater well locations used for water supply; and
- Access roads.

Each solar field has an associated power island, which are largely identical to each other. The major components of each Alpha and Beta power island are the following:

- SSG and associated heat exchangers,
- One STG and condenser,
- Electrical switchyard with step-up transformer and auxiliary transformer,
- One wet cooling tower,
- One natural-gas-fired auxiliary boiler,
- Steam-fed HTF freeze-protection heat exchangers,
- HTF expansion vessels and HTF expansion tanks,
- Firewater pump and pump house with associated diesel fuel tank,
- One raw water storage tank,
- One combined service water and firewater storage tank,
- Various water treatment storage tanks,
- Demineralized water storage tank, and
- Ancillary equipment.

3.5.2 Solar Thermal Fields

The proposed solar collector fields are made up of two large fields (the Alpha solar field and the Beta solar field) of single-axis-tracking parabolic trough solar collectors. Each solar field encompasses approximately 710 acres of the plant sites and utilizes solar trough technology similar to the nine existing SEGS units but with design improvements to enhance performance. The collectors are modular and are part of many parallel rows of solar collectors, aligned on a north-south axis. Each solar collector has a linear, parabolic-shaped reflector that focuses the sun's radiation on a linear receiver, known as an heat collection element (HCE), located at the focus of the parabola.

The collectors 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 HCE. The HTF is heated to approximately 740 degrees Fahrenheit (°F) as it circulates through the HCEs and returns to a series of heat exchangers where the fluid is used to generate steam in the SSG system at the power island, providing steam to the Plant's STG. The seam expands through the STG turbine blades to drive the steam turbine, which in turn drives the generator.

The major pieces of equipment for the proposed solar portion of each Plant are as follows:

- Solar collector arrays (SCA);
- SCA components: Mirrors, HCEs, ball-joint connectors, etc.;
- HTF;
- SSG system;
- HTF freeze-protection heat exchangers;
- HTF pumps;
- HTF expansion vessels and tanks; and
- HTF piping headers.

It is expected that Therminol™ VP-1, Dowtherm A, or equivalent will be used as the HTF. These synthetic oils are special high-temperature oils with an excellent operating history and are widely used in solar thermal and other high-temperature heat transfer applications. These oils are aromatic hydrocarbons, specifically biphenyldiphenyl oxide. The oil is regulated as a hazardous material by the State of California.

3.5.3 Electrical Systems

All of the net power produced by the proposed facility is currently expected to be delivered to the Statewide transmission grid through the Project's interconnection with the existing Kramer–Coolwater 230 kV transmission line (see below). Roughly 10% of the Project's output will be used on site for plant auxiliaries such as pumps; control systems; and general facility loads including lighting and heating, ventilation, and air conditioning (HVAC).

On each power island, power will be generated by its STG at 13.8 kV (depending on the final generator selection) and stepped up by a fan-cooled generator step-up transformer in the 230-kV power island switchyard for connection to the transmission interconnection. Plant auxiliary load will be from an auxiliary power transformer fed from the 230-kV power island switchyard with a step-down transformer and distributed internally to the plant loads at 13.8 kV. There will be one emergency diesel-engine-driven generator for each power island to provide standby power and facilitate plant shutdown in the event of power disruption. Each power island can be run independently. Surge protection devices, surge arrestors, and equipment to measure basic impulse levels will be installed to protect against ground faults, lightening, and switching surges.

3.5.4 Plant Auxiliary Systems

The Project includes various power plant auxiliary systems such as an auxiliary boiler, fuel supply, water supply, water treatments, cooling systems, and waste management.

Auxiliary Boiler

One nominal 15,000-pound-per-hour auxiliary boiler will be included on each power island. This auxiliary boiler will be able to provide steam to the HTF freeze protection heat exchangers, steam turbine seal system, deaerator, and other components while the SSG is off line. Once the plant commences normal operations, the use of the natural-gas-fired auxiliary boilers ceases. Each boiler will require natural gas fuel supply.

Fuel Supply

Natural gas will be supplied to the Project from an existing 16-inch-diameter pipeline that runs to the Project under Harper Lake Road. This pipeline was installed for the original six SEGS projects envisioned at Harper Dry Lake. See below for a description of connection with existing natural gas facilities.

Water Supply and Use

The Project's various water uses will include makeup for the circulating water system and cooling tower, makeup for the SSG, water for SCA washing, service water, potable water, and fire protection water. The estimated water requirements for the power plant's various water uses are presented in Table 1, Water Use (for each Plant site). They include the average, peak, and annual usage for each Plant site, and are based on the modeled annual gross production. Equipment sizing will be consistent with peak (design) daily rates to ensure adequate design margin.

Table 1
Estimated Water Use

Water Use	Average Rate (Gallons/Minute)	Peak Rate (Gallons/Minute)	Estimated Annual Use (Acre-Feet)
Plant Operation	667	1,093	1,077
Potable Water	3.1	3.1	5

Source: Abengoa 2009

Process and cooling water needs of the Project will be met by use of groundwater pumped from wells on the plant site. Water for domestic use by employees will also be provided by onsite groundwater treated to potable water standards by a packaged treatment unit. New water supply wells will need to be installed to provide the reliability needed during plant operations. These wells will draw from the adjudicated water rights owned by the Project developer.

The remaining agricultural wells may be used to monitor groundwater levels and quality. Those wells located within the solar array footprint will have their pump motors and bowls removed and cut down to near-surface grade elevations and decommissioned in accordance with applicable regulations. No offsite backup water source of supply will be included as part of the Project.

On both the Alpha and Beta plant sites, raw water and service water storage tanks, each having a capacity of 1,930,000 gallons, will 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 will be dedicated to the plant's fire protection water system.

The Project proposes to use wet cooling towers for power plant cooling and owns adjudicated water rights for this purpose. The Mojave Water Agency (MWA) administers the adjudication

and manages water rights for all users through the Watermaster. Water will be supplied from onsite groundwater wells drawing from these water rights. The water quality is brackish and not suitable for potable purposes without extensive treatment. No offsite backup cooling water supply is planned; the use of multiple onsite water supply wells, redundancy in the well equipment, and reserve water storage will provide an inherent backup. No offsite water pipeline facilities are proposed as part of this Project. The aquifer has been characterized as prolific and studies indicated that the health of the basin will not degrade during the life of the plant due to the Project.

Water Treatments

The raw water (groundwater), circulating water, SCA washing water, and steam cycle process water all require onsite treatment and this treatment varies according to the quality required for each of these uses. The following briefly describes the water treatments and uses.

Groundwater

The groundwater will be pumped to the raw water storage tank and treated with a biocide (sodium hypochlorite). This water is used directly in the cooling tower as make-up water.

Circulating Water Treatment

To reduce overall water consumption and sizing of evaporation ponds, service water will first be used as makeup to the cooling tower and circulating water system. The water will be treated with water conditioning chemicals and sulfuric acid will be fed into the circulating water system for alkalinity reduction to control the mineral scaling tendency. Additional treatments for mineral scale formation and biocides may be fed into the circulating water system.

The blowdown from the circulating water/cooling tower system will be continually treated by lime-softening clarification (clarifier) and filtration processes, and then delivered to a clear well. A portion of this stream will then be further treated for various plant uses that require higher purity water, such as SCA cleaning and steam system makeup. The solid waste discharge from the filter press will be trucked to an appropriate land fill. This process reduces the metals content in the water prior to use elsewhere in the system along with extracting these prior to discharge in the evaporation ponds. The overflow water from the clarifier will be delivered to the clarified water tank, and then pumped through a set of pressure filters to remove the small amount of solids that carry over from the clarifier. The pressure filter product stream will then be directed to the clear well tank. From the clear well, the water will be treated by the Cooling Tower

Reverse Osmosis (CTRO) system so it can be used for other plant requirements. The product stream from the CTRO is delivered to the reverse osmosis RO surge tank. The flow out of the clear well and through the CTRO is demand-based, so that any excess clear well water will be recycled back to the cooling tower for further use. The CTRO utilizes several stages of RO treatment to remove most of the mineral content of the water. The reject stream from the CTRO process will be brackish water; this will be discharged to the evaporation ponds. The CTRO process is designed to minimize the amount of waste water sent to the ponds. The RO surge tank water is withdrawn, as required, for further treatment and ultimately for use in SCA washing and steam cycle makeup.

Solar Collector Array Washing Water

To facilitate dust and contaminant removal, partially deionized (demineralized) water will be used to clean the SCAs on a periodic basis. This operation is generally completed at night and involves a water truck spraying deionized water on the SCAs in a drive-by fashion. The deionized water production facilities, already in place for SSG makeup water, will be sized to accommodate the additional SCA washing demand of about 60 gallons per minute (average) for each Plant site. Water from the SCA washing operation is expected to evaporate on the SCAs with minimal water applied to the ground. No site runoff or recharge is anticipated from this process.

The RO surge tank water is further treated with another stage of RO to obtain water with very low mineral content. The product water from this RO stage will be stored in a surge tank, and will then be withdrawn only as needed for SCA cleaning and for further treatment for steam cycle makeup. The reject stream from the SCA cleaning RO treatment is recycled back to the raw water tank, where it will be used to supplement groundwater for cooling tower makeup. This method results in no waste stream from the SCA cleaning RO treatment.

Steam Cycle Process Water

Makeup water for the steam cycle must meet American Society of Mechanical Engineers (ASME) Boiler Code for silica and dissolved solids. To meet these specifications, water will be processed through a demineralized water system. Water produced by this system will only be used for makeup to the steam cycle. The reject stream from the RO treatment is recycled back to the RO surge tank, resulting in no net waste stream. Additional conditioning of the condensate and feedwater circulating in the steam cycle will be provided by means of a chemical feed system.

Cooling Systems

Each of the power islands include two cooling systems, 1) the steam cycle heat rejection system (e.g., cooling tower) and 2) the closed cooling water system (equipment cooling), each of which is discussed in this section.

The cooling system for heat rejection from the steam cycle consists of a surface condenser, circulating water system, and a wet cooling tower. The surface condenser receives exhaust steam from the low-pressure section of the STG and condenses it to liquid for return to the SSG. The surface condenser is a shell-and-tube heat exchanger with wet, saturated steam condensing on the shell side and circulating water flowing through the tubes to provide cooling. The warmed circulating water exits the condenser and flows to the cooling tower to be cooled and reused. The circulating water is cooled primarily through partial evaporation and secondarily through heat transfer with the air. The cooled circulating water is pumped from the cooling tower basin back to the surface condenser and auxiliary cooling water system.

The closed cooling water system uses water from the cooling tower for the purpose of cooling equipment, including the STG lubrication oil cooler, the STG generator cooler, steam cycle sample coolers, and large pumps. The water picks up heat from the various equipment items being cooled and rejects the heat to the cooling tower through a closed loop heat exchanger.

Waste Management

Project wastes include industrial wastewater discharged to evaporation ponds, sanitary wastewater, non-hazardous solid waste, hazardous solid waste, and hazardous liquid waste.

It is expected that each Plant site will have two double-lined evaporation ponds with a nominal surface area of 5 acres each for a total of 10 acres per site or 20 acres for the entire Project. The ponds will be designed in accordance with Lahontan Regional Water Quality Control Board (RWQCB) requirements. Each pond will have enough surface area so that the evaporation rate exceeds the cooling tower blowdown rate at maximum design conditions and at annual average conditions. Pond depth will be selected so that the ponds will not need to have residual solids removed during the life of the plant. The pond liner system is expected to consist of a 60 mil high-density polyethylene (HDPE) inner liner and a 50 mil HDPE outer liner. Between the liners is a synthetic drainage net that is used as part of the leachate collection and removal system (LCRS). Monitoring of the evaporation ponds will be required to detect the presence of liquid and/or constituents of concern. The LCRS will be monitored and a series of monitoring wells will also be used for the evaporation ponds. Based on the power plant process, chemicals used,

and water quality, it is expected that the constituents of concern for this monitoring will include chloride, sodium, sulfate, total dissolved solids (TDS), biphenyl, diphenyl oxide, potassium, selenium, chromium, and phosphate. The proposed detection monitoring program for the facility consists of monitoring the LCRS, lysimeters, and monitoring wells for the presence of liquid and/or constituents of concern.

The Project's sanitary system will collect wastewater from sanitary facilities such as sinks and toilets. This waste stream will be sent to onsite sanitary waste septic systems located at each power island.

The Project will include bioremediation/land farm units to treat soil contaminated with HTF in the event of a leak or spill. The proposed bioremediation and land farm facilities will cover an area of approximately 1.5 acres on each plant site. Appropriate contamination level for bioremediation and land farming of site-specific soils will be determined by Lahontan-approved testing to ensure the adequacy of the bioremediation/land farm unit design for HTF-contaminated soil. Contaminated soil that exceeds this level will be disposed of at an appropriate waste facility. The bioremediation/land farm area will be designed in accordance with Lahontan RWQCB requirements and will include a leak detection system and monitoring wells. Treatment in the bioremediation unit involves the addition of nitrogen and phosphorous (i.e., fertilizers) as nutrients to the HTF-contaminated soil to stimulate consumption of HTF by the indigenous bacteria. The soil will remain in the bioremediation/land farm unit until concentrations are reduced to appropriate levels for use as fill material on the site.

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

Small quantities of hazardous wastes will be generated during Project construction and operation. Hazardous wastes generated during the construction phase include substances such as paint and primer, thinners, and solvents. Hazardous solid and liquid waste streams generated during Project operations include substances such as used HTF, used hydraulic fluids, oils, greases, and filters, as well as spent cleaning solutions and spent batteries. To the extent possible, both construction and operation-phase hazardous wastes will be recycled.

Other Auxiliary Systems

Other systems include fire protection; a Distributed Control System to provide control, monitoring, alarm, and data storage functions for power plant systems; cathodic protection systems; freeze protection systems; service air systems and instrument air systems; telemetry; and HTF leak detection.

3.5.5 Other Structures

The Project will include other structures such as a warehouse, control/administrative building, water treatment building, water storage tanks, roads, fences, and stormwater drainage facilities. A warehouse and control/administration building will be located in each power island. Solar collector array assembly buildings will be installed in the northeast portion of the Alpha solar field, which will be later converted to warehouses. Other plant site "buildings" will include the water treatment building and a number of pre-engineered enclosures for mechanical and electrical equipment. The total square footage of the various proposed Project buildings and pre-engineered enclosures (e.g., control/administration building, warehouse, electrical equipment enclosures) is approximately 185,000 square feet for the entire Project.

There will be a number of covered water tanks on each site, including a 1,930,000-gallon raw water storage tank for short-term backup cooling water supply, with a portion (360,000 gallons) dedicated to the plant's fire protection water system and a 1,930,000-gallon service water storage tank. There will also be a 164,500-gallon storage tank for storage of demineralized water. Water storage tanks will be vertical, cylindrical, field-erected steel tanks supported on foundations consisting of either a reinforced-concrete mat or a reinforced-concrete ring wall with an interior bearing layer of compacted sand supporting the tank bottom.

Only a small portion of the overall plant site will be paved, primarily the site access road and portions of the power island (paved parking lot and roads encircling the STG and SSG areas). Each power island will be approximately 20 acres with approximately 1.75 acres of paved area. The solar field will remain unpaved and without a gravel surface to prevent rock damage from SCA wash vehicle traffic. An approved dust suppression coating will be used on the dirt roadways within and around the solar field. Roads and parking areas located within the power island area and adjacent to the administration building and warehouse will be paved with asphalt and are included in the total above.

The Project solar field and support facilities' perimeter will be secured with chain-link metal-fabric fencing, 6 to 8 feet tall. Controlled access gates will be located at the power island entrances and serve as normal access to the solar fields. Desert tortoise exclusion fencing will be installed at the base of the chain-link fence and tortoise-proof gates will be used.

3.5.6 Stormwater Drainage Channel

The Project will capture offsite stormwater sheet flow and direct it around the Project site and to Harper Dry Lake via several drainage channels that traverse the Project site, conveying flows from west to east (Figure 3). Stormwater from the watershed tributaries to the site enter the Project in the form of sheet flow along the southern and eastern site boundaries. Storm sheet flow will be intercepted as it enters the site, conveyed around the Project, and returned to its historical flow location and parameters as it flows into Harper Dry Lake. Earth-lined drainage channels will be constructed to intercept the flows entering the site boundary.

These channels will be sized and designed to convey the calculated storm runoffs from the 100-year storm event following County of San Bernardino Flood Control District standards. Channel design and construction will incorporate measures to mitigate slope erosion, provide freeboard allowances, and provide access for channel maintenance. A primary drainage channel will traverse the Project site from west to east along the southern border of the Alpha solar field. According to conceptual designs, this channel will have an earthen bottom and varying widths of 313 to 335 feet from top of bank to top of bank and varying depths of 12 to 15 feet. The northern bank adjacent to the solar plant will require slope protection consisting of a gabion mattress. The southern bank will generally be earthen except where the channel is adjacent to the paved portion of Lockhart Road, in which case a gabion mattress will also be required. The channel banks will be 2:1 (horizontal:vertical) slopes and vary from 24 to 30 feet wide. A 20-foot maintenance road will run parallel to the north and Lockhart Road will run parallel to the south of the drainage channel.

Other smaller, earthen-bottom drainage channels will traverse the Project Site to convey flows around the Beta solar field. A 130-foot-wide drainage channel will be located south of the western wing of the Beta solar field. A 132-foot-wide channel will traverse north to south along the western edge of the main Beta solar field. A drainage channel varying in width from 73 to 110 feet will be located south of the Beta solar field between the solar panels and the existing SCE 230-kV transmission lines. All of these channels will have gabion mattresses installed on the northern or western banks (the banks adjacent to solar fields). All of the banks will have 2:1 (horizontal:vertical) slopes.

The proposed Project Site is located in the arid Mojave Desert (average annual rainfall in the site vicinity reported as less than 7 inches) and is largely fallow agricultural land. The existing topographic conditions of the Project site show an average slope of 1%. The property's existing conditions creates sheet drainage/run-off during infrequent large precipitation events. The Alpha

and Beta power island areas are centrally located within their respective solar fields. The power islands will drain via sheet flow away from equipment foundations to the solar fields. Local area containments will be provided around certain locations, such as oil-filled transformers and chemical storage areas. The water from these areas and from other plant drains will 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 will then be rejected into the evaporation ponds. Water in the solar field area will be allowed to settle in the solar fields and percolate. To facilitate this, bermed areas will be used around the solar field tiers. Site runoff is not anticipated from the solar field.

The Project will employ a comprehensive system of management controls, including site-specific Best Management Practices (BMPs), to minimize storm water contact with contaminants and thus minimize pollutants in storm water. These management controls are as follows:

- Employee Training Program
- Erosion and Sediment Control
- Good Housekeeping Programs
- Preventive Maintenance Programs
- Structural BMPs
- Temporary containments during maintenance activities
- Permanent secondary containment structures at chemical storage and process areas
- Materials, Equipment and Vehicle Management Practices
- Spill Prevention and Response Programs
- Inspection Programs

3.5.7 Natural Gas Supply

Natural gas for the Project's ancillary purposes, such as the auxiliary boilers and space heating, will be supplied by an existing Southwest Gas Corporation (SGC)-owned pipeline that runs to the Project boundary near the Alpha power island. No offsite gas pipeline facilities are proposed as a part of this Project.

The interconnection will service both power islands independently. A pipeline will be installed within the Project boundary to support the Beta site power island from the interconnection location near the Alpha power island. Starting at the tap station adjacent to the west side of the Alpha power island, the pipeline is routed underground to the Alpha power island metering and reducing station. A tee will be installed downstream of the tap in the line to supply the Alpha

power island and to route gas to the Beta power island. To supply the Beta power island, an underground pipeline will be installed from the tee and extend west to a point north of the Beta power island, turn south and terminate at the Beta power island metering and reducing station. The total distance from the tee to the Beta metering and reducing station is approximately 2 miles.

3.5.8 Transmission Line Interconnection

The Project is proposing interconnection to connect to the Kramer–Coolwater 230-kV transmission line, which is owned by SCE and located adjacent to the southern border of the Project. The Project is located approximately 32 transmission-miles west of the Cool Water generating facility and approximately 13 transmission-miles east of the Kramer interconnection substation. An Interconnection Facilities Study (IFS) is in progress to detail the on-the-ground systemwide improvements. As a separate process, SCE will lead the permitting effort for transmission improvements beyond the Project-specific interconnection to the Statewide system. However, for the purpose of this BA, the SCE fiber optic cable improvements beyond the point of interconnection have been included as part of the analysis herein. All Project-related transmission facilities are within the Project boundaries, and the fiber optic cable improvements beyond the point of interconnection are located outside of the MSP boundary.

New Substation

To interconnect the Project into the existing Kramer–Coolwater No. 1 230-kV transmission line, a new substation will be needed. This substation, located in the Beta solar field (referred to as "Lockhart Substation"), is approximately 13 transmission-miles east from the existing Kramer Substation and approximately 32 transmission-miles west of the existing Cool Water Substation. Further, the substation will allow SCE the ability to loop the existing Kramer–Coolwater #1 230-kV transmission line and provide for the required gen-tie-line positions.

The footprint for the Lockhart Substation and loop-in are adjacent to the Beta solar field but located within lands owned by MSLLC and not BLM. All appropriate investigations that were included within the site boundary were also included in the area needed to loop-in the Project within the transmission right-of-way, adjacent to the Project boundary. The substation will be located on the Project Site in the Beta field and will be designed to SCE's specifications. The interconnection is proposed on the Project Site and the loop-in lines will extend to a point under the adjacent power lines in the transmission right-of-way.

Onsite Transmission Lines

The Project will require onsite transmission lines. 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 Project Site and will be installed on approximately 23 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 Project transmission line route will be from maintenance roads within the Project boundary. No offsite transmission line is required to interconnect the Project.

3.5.9 SCE Communication Facilities

The description below and the environmental analysis are organized by the three main study areas: 1) the fiber optic cable proposed between the Lockhart Substation and the Tortilla Substation in Barstow, 2) the fiber optic cable proposed between the Lockhart Substation and the Kramer Substation to the west along Highway 395, and 3) the fiber optic cable proposed between the Kramer and Victor substations.

Lockhart to Tortilla Substation Fiber Optic Line

The 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/MSP, transitioning to new overhead poles near the edge of the SCE transmission corridor to the south. The cable would require the construction of approximately 55 new poles between the Lockhart Substation and Harper Lake Road (Figure 2b). These poles would be constructed within existing SCE right-of-way for the Coolwater–Kramer 220-kV transmission line. At the intersection with Harper Lake Road, the overhead line would transition to a new underground conduit for approximately 400 feet south on the west side of Harper Lake Road. The new underground trench would be located within a disturbed road right-of-way. 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. The cable would be strung along these existing poles. This method, stringing the cable on existing transmission line structures, is proposed to continue between the intersection of Harper Lake Road/SR 58 all along SR 58 heading east, 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 located approximately one-third-mile south of Main Street. The cable is proposed to be strung on the existing transmission line structures (called the

Poco 33-kV line) for approximately 4.7 miles, then would continue to be strung on existing transmission line structures south on I Street. Where the overhead line intersects Bonanza Road, the cable is proposed to be strung on existing transmission line structures heading east along Bonanza Road until intersecting with the existing SCE Kramer–Tortilla 115-kV transmission line. The fiber optic cable would be strung on those existing structures until about 500 feet west of the Tortilla Substation, at which point it would transition to an existing underground conduit via a riser. The fiber optic cable would require a new telecommunications room within the Tortilla Substation and new fiber optic multiplex equipment and channel equipment. Refer to Figures 1 and 2b for the location of the route, new poles, existing poles, and underground conduit for the fiber optic cable.

For purposes of this analysis, the following assumptions are made for impacts:

- New poles will be located within existing utility rights-of-way
- New poles will be between 18 and 24 feet in height and will consist of either wood or light-duty steel
- Footprints for new pole construction is assume to be an area of approximately 2 square feet for permanent impacts and 34 square feet for temporary construction impacts
- New underground trenching will necessitate a maximum construction footprint of 20 feet in width
- Stringing activities and construction equipment will be located within existing utility rights-of-way

Lockhart to Kramer Substation Fiber Optic Line

Fiber optic cable between the Lockhart Substation and Kramer Substation commences with trenching within the substation site to install the cable in an underground conduit approximately 1,000 feet long until it reaches the overhead poles for the proposed substation light and power lines. These overhead poles, approximately 30 poles, are new poles proposed within the MSP property between the substation and Lockhart Road to the north (Figure 4). From Lockhart Road, the fiber optic cable is proposed to 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. Proposed cable would be strung on existing overhead transmission line structures along the west side of Harper Lake Road until it intersects with the existing SCE transmission line right-of-way for the Lockhart 33-kV and Coolwater–Kramer 220-kV transmission lines. From this point, the cable would be strung on existing overhead structures within the existing right-of-way until just east of 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. 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 (MEER) within the substation. New fiber optic multiplex equipment and channel equipment would be required at the Kramer Substation. Refer to the bulleted items above under the Lockhart to Tortilla Substation line relative to fiber optic cable footprint assumptions. Installation of cable in existing conduit within the Kramer Substation would not require new trenching and activities would occur within the substation boundary. Refer to Figures 1 and 2c for the location of route, new poles, existing poles, and underground conduit.

Kramer to Victor Substation Fiber Optic Line

Fiber optic cable connecting the Kramer Substation to Victor Substation would commence at the MEER 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. While it is possible that the fiber optic cable between the Kramer Substation and Victor Substation can use existing poles for the majority of the route, additional analysis is underway by SCE to make that determination. For purposes of a worst-case analysis, it is assumed that for the first 19 miles heading south from the Kramer Substation, new poles will be erected for the fiber optic cable (Figure 1). It is assumed the new poles will be located within the existing transmission line rights-of-way, located on the west side of Highway 395. Approximately 525 poles would be required for this stretch of the route, with poles spaced approximately 190 feet apart. At approximately 19 miles south of Kramer Substation, the fiber optic cable would be strung on existing overhead power lines for approximately 9.5 miles until it transitions to a new underground conduit for 1,000 feet within Bellflower Street, a paved street that parallels Highway 395 to the west. Trenching would occur within an existing paved street until the cable would transition to existing overhead power lines via a riser and continue on the overhead power line poles for another 1,000 feet until the line intersects with Bartlett Avenue. The fiber optic cable would continue to be strung on existing overhead power line poles along Bartlett Avenue for approximately one-third mile until it intersects with Highway 395. The cable would continue on overhead poles on the west side of Highway 395 for another 5 miles south to Palmdale Road, then head east across Highway 395 to the Victor Substation for a distance of approximately one-half mile. At the edge of the Victor Substation, the cable would transition via a riser to an existing underground conduit within the substation to the MEER. Refer to Figures 1 and 2c for the location of new poles, exiting poles, and underground conduit for the fiber optic cable. Refer to the bulleted items above under the Lockhart to Tortilla Substation line relative to fiber optic cable footprint assumptions. Installation of cable in existing conduit within the Victor and Kramer substations would not require new trenching and activities would occur within the

station boundary. New trenching at the Kramer Substation would follow assumptions listed previously.

3.6 Project Construction

3.6.1 Construction Schedule

The proposed construction schedule would occur over a period of 26 months, and is anticipated to follow this approximate timeline:

- Begin construction: Fall 2010
- Complete construction: Fall 2012
- Initial startup and test: Fall 2012
- Full-scale commercial operation: Winter 2012 (subject to timing of regulatory approvals)

Upon completion of construction, the MSP is expected to operate for a minimum of 30 years. Therefore, the Proposed Action will cover a period of 32.25 years.

3.6.2 Construction Activities

New construction associated with the Project includes the following:

- Two separate power island areas, one each for the Alpha and Beta plant areas
- Construction laydown and solar collector assembly building 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 area
- Onsite gas pipeline facilities with connection point to existing pipeline
- Drainage improvements to convey offsite storm water around the Project
- Groundwater well locations used for water supply
- Access roads
- SCE fiber optic line construction between substations

Site Grading and Earthwork

The entire Project footprint (1,765 acres) will be graded. The solar field areas will be graded generally following the existing contours of the site as planar tiers to accommodate the installation of the solar field components. Existing site elevations range from approximately 2,025 to 2,105 feet amsl. Mass grading of the site will occur at the beginning of the Project construction period. The grading will result in a range of slopes similar to the existing slope of the site. The preliminary site grading plan will be designed to be balanced; no import or export of soil will be expected for general earthwork. Earthwork associated with the proposed Project will include excavation for foundations and underground systems.

Earthwork associated with the Project will also include excavations for foundations and underground systems, and the total earth movement that will occur is approximately 4.158 million cubic yards.

The Project's power islands and solar field areas will be graded to allow for a balanced distribution of material, so there will 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. The cut and fill grading necessary to create suitable conditions for Project construction will result in an elevation of approximately 2,065 feet amsl. Adjustments will be made to provide engineered fill as required for stabilization under equipment and structure foundations for the Project geotechnical report. Only soil materials approved by a geotechnical engineer for structural fill will be used. Additionally, specialized granular materials may need to be imported to the proposed site for road base and possible use below foundations.

Roadway and Drainage Channel Crossing Improvement

Access to the Project will be provided along Harper Lake Road and Lockhart Road. Road widths and pavement types will 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 will be provided to both power islands for emergency and fire access. Drainage channel crossings on Harper Lake Road and Lockhart Road will 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 will be provided via fair-weather crossings along vehicular access during fair weather, while allowing drainage flows to cross the roadways during periods of storm runoff.

General Steps of Construction

Temporary construction laydown and parking areas will be located at logical places on the Project site consistent with the material stored. An area in the northeast portion of the Alpha solar field will be used to assemble the SCAs in buildings. Upon completion of construction, a portion of this area will be filled with SCAs and the SCA assembly buildings will remain as warehouses. 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 fields and power islands will be completed during the first 6 months of the construction schedule. Finish grading and repairs will occur during the remaining construction period as portions of the Project are completed.
- *Foundations*: This includes excavations for large equipment (STG, SSG, GSU, 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 will be installed. The solar field components will be assembled in the onsite SCA assembly buildings and installed on their foundations.
- *Balance of Plant*: With the major equipment in place, the remaining field work will be piping, electrical, and smaller component installations.
- *Testing and Commissioning*: Testing of subsystems will be done as they are completed. Major equipment will be tested once all supporting subsystems are installed and tested.

Equipment and materials will be delivered to the Project Site by truck; large components (e.g., STG) and bulk deliveries will be received in Barstow by rail, transferred to truck and then delivered to the site. To minimize impacts due to traffic, the Project plans to use a bussing service from a location in Barstow. This will significantly reduce the number of vehicles required to travel on Harper Lake Road and alleviating any congestion at Harper Lake Road and SR 58. The Project plans to receive shipments by rail at the Barstow Burlington Northern Santa Fe (BNSF) Rail Facility. This facility currently exists and has sufficient capacity to receive and provide logistic support for the Project.

Construction of Natural Gas Supply

The natural gas pipeline will be constructed as part of the overall site construction. The pipeline will be installed in maintenance road rights-of-way to allow for future access if necessary. Prior to installation, the pipe will be laid along the route. Pipeline construction will take approximately 1 month and is expected to begin following the grubbing and clearing of the Project site and in coordination with mass grading. During non-work hours, the exposed trench will be covered with temporary coverings to provide safety. The construction of the natural gas pipeline will consist of the following:

- *Trenching:* The optimal trench will be approximately 36 inches wide and 4 to 10 feet deep. With loose soil, a trench up to 8 feet wide at the top and 3 feet wide at the bottom may be required. The pipeline will be buried to provide a minimum cover of 36 inches. The excavated soil will be piled on one side of the trench and used for back filling after the pipe is installed.
- *Stringing:* Lengths of pipe are laid on wooden skids beside the open trench.
- *Installation:* This process consists of bending, welding, and coating the weld-joint areas of the pipe after it has been strung, padding the ditch with sand or fine spoil, and lowering the pipe string into the trench. Welding will meet the applicable standards and will be performed by qualified welders. Welds will be inspected in accordance with appropriate standards. Welds will undergo 100% inspection by an independent, qualified radiography contractor. All coating will be checked for defects and will be repaired before lowering the pipe into the trench.
- *Backfilling:* This process consists of returning spoil back into the trench around and on top of the pipe, ensuring that the surface is returned to its original grade or level. The backfill will be compacted to protect the stability of the pipe and to minimize subsequent subsidence.
- *Plating:* This consists of covering any open trench in areas of foot or vehicle traffic at the end of a workday. Plywood plates will be used in areas of foot or wildlife traffic and steel plates will be used in areas of vehicle crossing to ensure public safety. Plates will be removed at the start of each workday. Efforts will be made to minimize the length of open trench along the right-of-way.
- *Hydrostatic Testing:* This consists of filling the pipeline with water, venting all air, increasing the pressure to the specified code requirements, and holding the pressure for a period of time. After hydrostatic testing, the test water will be chemically analyzed for contaminants and discharged to the surrounding area, unless the analysis shows that the

water is contaminated, in which case, the water will be trucked to an appropriate disposal facility.

- *Cleanup:* This consists of restoring the surface of the right-of-way by removing any construction debris, grading to the original grade and contour.
- *Commissioning:* This consists of cleaning and drying the inside of the pipeline, purging air from the pipeline, and filling the pipeline with natural gas.

A gas-metering station will be required at the tap point to measure and record gas volumes. In addition, facilities will be installed to regulate the gas pressure and to remove any liquids or solid particles. The metering station at the tap point will require an area of approximately 5,000 square feet. In addition, the two plant metering sets will require a fenced enclosure of approximately 1,000 square feet. Construction activities related to the metering station and metering sets will include grading a pad and installing above- and below-ground gas piping, metering equipment, gas conditioning, pressure regulation, and possibly pigging facilities. A distribution power line for metering station operation lighting, communication equipment, and perimeter chain-link fencing for security will also be installed.

Construction of Transmission Lines

Transmission line construction will include the installation of power poles and the new Lockhart interconnection station and involves the following sequence of activities:

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

Construction of SCE Fiber Optic Lines

SCE would utilize SCE's existing substations, SCE's Barstow Service Center, and the proposed Lockhart Substation as staging and laydown areas to support the installation of the telecommunications facilities required for this Project. Construction and maintenance access

would be along existing paved and unpaved roads. SCE or contractor crews would use standard methods to construct the required fiber optic cables.

Construction Equipment

Typical construction equipment that will be required for the Project include dozers, front end loaders, haul trucks, graders, shovels, portable generators, derrick cranes, mobile cranes, concrete pumps, tractors, un-quited paving breakers, and quieted paving breakers.

Equipment to be used in construction are as follows:

- Trucks (pick-up, flat-bed, and fueling),
- Dump trucks,
- Grading equipment (i.e., scrapers, compactor, dozers, water truck),
- Tractors,
- Cranes (fixed jib and telescopic jib),
- Piling machines for drilling,
- Air compressor for pneumatic construction tools and equipment,
- Welding equipment,
- Concrete mixers and other equipment needed for concrete compaction and finishing,
- Piping equipment,
- Small pump,
- Generator for construction tools, and
- Asphalt equipment (paver/finisher and spreader)

3.7 Conservation Measures

All conservation measures outlined below will be implemented within the Action Area. As previously described, Project construction activities will not affect critical habitat for the DT. A qualified DT biologist will be present during all proposed construction activities to oversee the effective implementation of conservation measures to protect the tortoise. Therefore, the current conservation measures outlined below are expected to be sufficient in protecting the DT within the Action Area.

3.7.1 Conservation, Avoidance, and Minimization Measures

The following is a list of general impact avoidance and minimization measures that will apply to all Project activities during construction and operation. These measures are standard practices designed to minimize and avoid environmental degradation. MSLLC and SCE will ensure implementation of these measures to avoid and minimize impacts to the greatest extent feasible. These measures will include the following proposed conditions of certification anticipated to be included in the License Decision issued for the Project by the California Energy Commission (CEC):

DESIGNATED BIOLOGIST SELECTION

BIO-1 The Project owner shall assign a Designated Biologist to the Project. The Project owner shall submit the resume of the proposed Designated Biologist, with at least three references and contact information, to the Energy Commission Compliance Project Manager (CPM), CDFG, and USFWS for approval.

The Designated Biologist must meet the following minimum qualifications:

1. Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field; and
2. Three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society; and
3. At least 1 year of field experience with biological resources found in or near the Project area; and
4. Meet current USFWS Authorized Biologist criteria[2] and demonstrate familiarity with protocols and guidelines for the desert tortoise; and

In lieu of the above requirements, the resume shall demonstrate to the satisfaction of the CPM, that the proposed Designated Biologist or alternate has the appropriate training and background to effectively implement the conditions of certification.

[2] USFWS designates biologists who are approved to handle tortoises as "Authorized Biologists." Such biologists have demonstrated to USFWS that they possess sufficient desert tortoise knowledge and experience to handle and move tortoises appropriately, and have received USFWS approval. Authorized Biologists are permitted to then approve specific monitors to handle tortoises, at their discretion. CDFG must also approve such biologists, potentially including individual approvals for monitors approved by the Authorized Biologist. Designated Biologists are the equivalent of Authorized Biologists. Only Designated Biologists and certain Biological Monitors who have been approved by the Designated Biologist would be allowed to handle desert tortoises.

DESIGNATED BIOLOGIST DUTIES

BIO-2 The Project owner shall ensure that the Designated Biologist performs the following during any site (or related facilities) mobilization, ground disturbance, grading, construction, operation, and closure activities. The Designated Biologist may be assisted by the approved Biological Monitor(s), but remains the contact for the Project owner and CPM.

1. Advise the Project owner's Construction and Operation Managers on the implementation of the biological resources conditions of certification;
2. Consult on the preparation of the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP), to be submitted by the Project owner;
3. Be available to supervise, conduct, and coordinate mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as special-status species or their habitat;
4. Halt any and all activities in any area when determined that there would be an unauthorized adverse impact to biological resources if the activities continued or a violation of Federal or State environmental laws or a violation of any environmental agreements/conditions made between the applicant and the CPM and/or the regulatory agencies;
5. Clearly mark sensitive biological resource areas, if present, and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;
6. Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (i.e., parking lots) for animals in harm's way;
7. Notify the Project owner and the CPM of any non-compliance with any biological resources condition of certification;
8. Respond directly to inquiries of the CPM regarding biological resource issues;
9. Maintain written records of the tasks specified above and those included in the BRMIMP. Summaries of these records shall be submitted in the Monthly Compliance Report and the Annual Report; and
10. Train the Biological Monitors, as appropriate, and ensure their familiarity with the BRMIMP, Worker Environmental Awareness Program (WEAP) training, and all permits.

BIOLOGICAL MONITOR SELECTION, QUALIFICATIONS, AND DUTIES

BIO-3 The Project owner's CPM-approved Designated Biologist shall submit the resume, at least three references, and contact information of the proposed Biological Monitors to the CPM, CDFG, and USFWS for approval. The resume shall demonstrate, to the satisfaction of the CPM, the appropriate education and experience to accomplish the assigned biological resource tasks, including:

1. Biological Monitors involved in any aspect of desert tortoise handling must meet the criteria to be considered a USFWS Authorized Biologist (USFWS 2008) and demonstrate familiarity with the most recent protocols and guidelines for the desert tortoise. Biological Monitors designated for other tasks by the Designated Biologist must be approved for those activities by the CPM, CDFG, and USFWS. Biological Monitors who do not meet the Authorized Biologist standard, may assist the Designated Biologist and other Biological Monitors who do meet the Authorized Biologist standard, but only under direct supervision by biologists approved as Authorized Biologists, per USFWS guidelines.
2. Biological Monitors involved in any aspect of Mohave ground squirrel surveys or handling must possess a California ESA Memorandum of Understanding pursuant to Section 2081(a) for Mohave ground squirrel or have adequate experience and qualifications to obtain this authorizations.
3. Biological Monitor(s) training by the Designated Biologist shall include familiarity with the conditions of certification and the BRMIMP, WEAP, and all permits.
4. The Biological Monitors shall assist the Designated Biologist in conducting surveys and in monitoring of site mobilization activities, construction-related ground disturbance, grading, boring, or trenching. The Designated Biologist shall remain the contact for the Project owner, BLM's Authorized Officer, and the CPM.

DESIGNATED BIOLOGIST AND BIOLOGICAL MONITOR AUTHORITY

BIO-4 The Project owner's Construction/Operation Manager shall act on the advice of the Designated Biologist and Biological Monitor(s) to ensure conformance with the biological resources conditions of certification.

If required by the Designated Biologist and Biological Monitor(s), the Project owner's Construction/Operation Manager shall halt all site mobilization, ground disturbance, grading, construction, and operation activities in areas specified by the Designated Biologist.

The Designated Biologist shall:

1. Halt any and all activities in any area when determined that there would be an unauthorized or unforeseen adverse impact to biological resources if the activities continued or a violation of Federal or State environmental laws or a

violation of any environmental agreements/conditions made between the applicant and the CPM and/or the regulatory agencies;

2. Inform the Project owner and the Construction/Operation Manager when to resume activities; and

3. Notify the CPM if there is a halt of any activities, and advise the CPM of any corrective actions that have been taken, or will be instituted, as a result of the work stoppage.

If the Designated Biologist is unavailable for direct consultation, the Biological Monitor shall act on behalf of the Designated Biologist. However, it is anticipated that the Designated Biologist will be on site during construction or otherwise available by phone.

WORKER ENVIRONMENTAL AWARENESS PROGRAM

BIO-5 The Project owner shall develop and implement a CPM-approved WEAP in which each of its employees, as well as employees of contractors and subcontractors, who work on the Project site or any related facilities during site mobilization, ground disturbance, grading, construction, operation, and closure are informed about sensitive biological resources associated with the Project.

The WEAP must:

1. Be developed by or in consultation with the Designated Biologist and consist of an onsite or training center presentation in which supporting written material and electronic media is made available to all participants;

2. Discuss the locations and types of sensitive biological resources on the Project site and adjacent areas, if present;

3. Present the reasons for protecting these resources;

4. Present the meaning of various temporary and permanent habitat protection measures as necessary;

5. Discuss penalties for violation of applicable Laws, Ordinances, Regulations, and Standards (e.g., Federal and State endangered species acts);

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

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

The specific program can be administered by a competent individual(s) acceptable to

the Designated Biologist.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN (BRMIMP) DEVELOPMENT AND COMPLIANCE

BIO-6 The Project owner shall develop a BRMIMP and submit two copies of the proposed BRMIMP to the CPM (for review and approval) and to CDFG and USFWS (for review and comment), if applicable, and shall implement the measures identified in the approved BRMIMP. A copy of the BRMIMP shall be kept on site and made readily available to biologists, regulatory agencies, the Project owner, contractors, and subcontractors, as needed.

The BRMIMP shall be prepared in consultation with the Designated Biologist and shall identify:

1. All biological resource plans, mitigation, monitoring, and compliance measures proposed and agreed to by the Project owner;

2. All applicant-proposed mitigation measures presented in the Application for Certification, data request responses, and workshop responses;

3. All biological resource conditions of certification identified as necessary to avoid or mitigate impacts;

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

5. All biological resource mitigation, monitoring, and compliance measures required in local agency permits, such as site grading and landscaping requirements;

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

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

8. A detailed description of measures that shall be taken to avoid or mitigate temporary disturbances from construction activities;

9. All locations on a map, at an approved scale, of sensitive biological resource areas subject to disturbance and areas requiring temporary protection and avoidance during construction;

10. Aerial photographs, at an approved scale, of all areas to be disturbed during Project construction activities, one set prior to any site (and related facilities)

mobilization disturbance and one set subsequent to completion of Project construction. Include planned timing of aerial photography and a description of why times were chosen;

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

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

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

14. A preliminary discussion of biological resources-related facility closure measures; and

15. A process for proposing plan modifications to the CPM and appropriate agencies for review and approval.

IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-7 Although components of the Proposed Action within the boundaries of the MSP site would only result in permanent impacts (i.e., no temporary impacts would occur), the SCE components outside of the MSP boundary would have temporary impacts. Therefore references to temporary impacts are related to the SCE components of the Propose Action. The MSP and SCE shall implement the following measures during construction and operation to manage the Project site and related facilities in a manner to avoid or minimize impacts to the local biological resources:

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

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

3. Minimize Traffic Impacts. Vehicular traffic during Project construction and operation shall be confined to existing routes of travel to and from the Project site, and cross-country vehicle and equipment use outside designated work areas shall be prohibited. The speed limit shall not exceed 25 miles per hour on Harper Lake Road and within fenced areas that have been cleared of tortoises; in unfenced habitat on unpaved roads, the speed limit shall be 15 miles per hour.

4. Monitor During Construction. The Designated Biologist or Biological Monitor shall be present at the construction site during all Project activities that have potential to disturb soil, vegetation, and wildlife. The USFWS-approved Designated Biologist or Biological Monitor shall walk immediately ahead of equipment during vegetation removal and grading activities. This would not apply to the MSP site, once it has been surveyed and cleared of desert tortoise, per BIO-9.

5. Minimize Impacts of Transmission/Pipeline Alignments, Roads, Staging Areas. Staging areas for construction on the plant site shall be within the area that has been fenced with desert tortoise exclusion fencing and cleared. Temporary disturbance areas associated with the SCE components of the Proposed Action outside the limits of the MSP boundary shall be designed, installed, and maintained with the goal of minimizing impacts to native plant communities and sensitive biological resources through the installation of temporary desert tortoise fencing around the limits of disturbance at each pole construction, underground cable installation, staging, or line pulling site.

6. Avoid Use of Toxic Substances. Road surfacing and sealants and soil bonding and weighting agents used on unpaved surfaces shall be non-toxic to wildlife and plants.

7. Avoid Vehicle Impacts to Desert Tortoise. Parking and storage shall occur within desert tortoise exclusion fencing to the extent feasible. No vehicles or construction equipment parked outside the fenced area, associated with the SCE fiber optic cable trenching and pole bore locations, shall be moved prior to an inspection of the ground beneath the vehicle for the presence of desert tortoise. During construction, a Biological Monitor shall drive along Project access roads, particularly Harper Lake Road, at least every 3 hours during the desert tortoise active period (April through May and September through October) looking for desert tortoise or other vulnerable wildlife within the roadway. Outside of the active period, roads shall be monitored at least twice a day in advance of peak AM and PM traffic periods. During operation, employees shall report any desert tortoise sightings along roadways to the Biological Monitor. If a desert tortoise is observed in the roadway or beneath a parked vehicle, it shall be left to move on its own, or a Biological Monitor may remove and transfer the animal as identified in the MSP Desert Tortoise Clearance and Relocation/Translocation

Plan (Desert Tortoise Plan). The Desert Tortoise Plan addresses moving desert tortoises and associated temperature concerns in detail.

8. Avoid Desert Tortoise Pitfalls. At the end of each work day, the Designated Biologist shall ensure that all potential desert tortoise pitfalls (trenches, bores, and other excavations) outside the permanently fenced area have been backfilled. If backfilling is not feasible, all trenches, bores, and other excavations shall be sloped at a 3:1 ratio at the ends to provide wildlife escape ramps, or covered completely to prevent wildlife access, or fully enclosed with tortoise exclusion fencing. All trenches, bores, and other excavations outside the areas permanently fenced with desert tortoise exclusion fencing shall be inspected periodically throughout and at the end of each workday, and at the beginning of each day by the Designated Biologist or a Biological Monitor. Should a tortoise or other wildlife become trapped, the Designated Biologist or Biological Monitor shall remove and relocate the individual to a safe location. Any wildlife encountered during the course of construction shall be allowed to leave the construction area unharmed.

9. Report Desert Tortoise Injury and Mortality. All inadvertent deaths of desert tortoise shall be reported to the appropriate Project representative, including road kill. Species name, physical characteristics of the animal (sex, age class, length, weight), and other pertinent information shall be noted and reported in the Monthly Compliance Reports. Injured animals shall be reported to CDFG or USFWS, and the CPM and the Project owner shall follow instructions that are provided by CDFG or USFWS. If CDFG or USFWS cannot be immediately reached, consideration should be given to taking the animal to a veterinary hospital.

10. Minimize Standing Water. Water applied to dirt roads and construction areas (trenches or spoil piles) for dust abatement shall use the minimal amount needed to meet safety and air quality standards in an effort to prevent the formation of puddles, which could attract desert tortoises, common ravens, and other wildlife to construction sites. A Biological Monitor shall patrol these areas to ensure water does not puddle and attract desert tortoise, common ravens, and other wildlife to the site and shall take appropriate action to reduce water application where necessary. Water refill stations will be engineered to avoid pooling water.

11. Minimize Spills of Hazardous Materials. All vehicles and equipment shall be maintained in proper working condition to minimize the potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. The Designated Biologist shall be informed of any hazardous spills immediately as directed in the Project Hazardous Materials Plan. Hazardous spills shall be immediately cleaned up and the contaminated soil properly disposed of at a licensed facility. Servicing of construction equipment shall take

place only at a designated area. Service/maintenance vehicles shall carry a bucket and pads to absorb leaks or spills.

12. Worker Guidelines. During construction and operations, all trash and food-related waste shall be placed in self-closing containers and removed daily from the site. Workers shall not feed wildlife or bring pets to the Project site. Except for law enforcement personnel, no workers or visitors to the site shall bring firearms or weapons.

13. Avoid Spread of Noxious Weeds. The Project owner shall implement the following Best Management Practices (BMPs) during construction and operation to prevent the spread and propagation of noxious weeds:

    A. Limit the size of any vegetation and/or ground disturbance to the absolute minimum and limit ingress and egress to defined routes;

    B. Reestablish vegetation quickly on disturbed sites and temporarily disturbed areas associated with the SCE component fiber optic lines and pole locations (see **BIO-8**);

    C. Prevent spread of nonnative plants via vehicular sources by implementing Trackclean™ or other methods of vehicle cleaning for vehicles coming and going from construction sites. Earth-moving equipment and construction vehicles shall be cleaned within an approved area or commercial facility prior to transport to the construction site. The number of cleaning stations shall be limited and weed control/herbicide application shall be used at the cleaning station(s);

    D. Use only weed-free straw, hay bales, and seed for erosion control and sediment barrier installations;

    E. Invasive nonnative species shall not be used in landscaping plans or erosion control; and

    F. Monitor and rapidly implement control measures to ensure early detection and eradication of weed invasions.

14. Implement Erosion Control Measures. Standard erosion control measures shall be implemented for all phases of construction and operation. All disturbed soils and roads within the Project site shall be stabilized to reduce erosion potential, both during and following construction. Areas of disturbed soils (access and staging areas) with slopes toward an ephemeral drainage or Harper Dry Lake shall be stabilized to reduce erosion potential.

REHABILITATION OF TEMPORARILY DISTURBED AREAS

BIO-8 For the temporary disturbance associated with the construction zone around each overhead transmission pole, underground fiber optic cable installation site, staging area, pulling site, etc., required for the SCE downstream upgrade, the following shall be implemented to restore native vegetation:

1. Stockpile Topsoil. To increase chances for revegetation success in temporarily disturbed areas, topsoil shall be stockpiled from the Project site for use in revegetation. Native topsoil from the least disturbed locations and only areas that are free of noxious weeds shall be used as a source of topsoil. Approximately 6 to 8 inches of topsoil shall be scraped from the borrow sites and stockpiled, with the top 1 inch from the borrow site used as top-dressing in revegetation areas. All other elements of topsoil use shall be as described in *Rehabilitation of Disturbed Lands in California* (Newton and Claassen 2003, pp. 39-40).

2. Restore Temporarily Disturbed Areas. Only seed from locally occurring species shall be used for revegetation. Seeding shall be conducted as described in Chapter 5 of *Rehabilitation of Disturbed Lands in California* (Newton and Claassen 2003). A list of plant species suitable for Mojave Desert region revegetation projects, including recommended seed treatments, are included in Appendix A-8 of the same report. The list of native plants observed during surveys of the Project area can also be used as a guide to site-specific plant selection for revegetation.

3. Control Noxious Weeds. Maintain percent cover of noxious weeds (species considered "moderate" or "high" threat to California wildlands as defined by the California Invasive Plant Council [CAL-IPC 2006] and noxious weeds rated "A" or "B" by the California Department of Food and Agriculture [CDFA]and any Federal-rated pest plants [CDFA 2009]) below current levels in rehabilitated areas.

4. Performance Standard. Native plants in the vegetation shall reach over the first 10 years of growth 80% of the initial density, absolute cover, and species richness, with progressive improvement during the 10-year period. Exotic species shall reach over the first 10 years of growth no more than four times the absolute cover of exotic plants in the original vegetation. Every effort shall be made to minimize invasion by exotic species, and the performance standards shall include a maximum allowable cover of exotic species.

DESERT TORTOISE EXCLUSION FENCING, CLEARANCE SURVEYS, AND RELOCATION/TRANSLOCATION PLAN

BIO-9 A Desert Tortoise Exclusion Fencing, Clearance Surveys, and Relocation/Translocation Plan (Desert Tortoise Plan) shall be developed in consultation with the CPM, CDFG, and USFWS. This Plan shall include detailed

measures to avoid and minimize impacts to desert tortoise in and near the construction areas, as well as methods for clearance surveys, fence installation, tortoise handling, artificial burrow construction, egg handling, and other procedures, which shall be consistent with those described in the USFWS *Desert Tortoise Field Manual* (www.fws.gov/ventura/speciesinfo/protocols_guidelines) or more current guidance provided by CDFG and USFWS. At a minimum, the following measures shall be included in the plan and implemented by the Project owner to manage the construction site, and related facilities, in a manner to avoid, minimize, or mitigate impacts to desert tortoise.

1. Fence Installation. Prior to ground disturbance, the entire MSP site shall be fenced with desert tortoise exclusion fence. To avoid impacts to desert tortoise during fence construction, the proposed fence alignment shall be flagged and the alignment surveyed within 24 hours prior to fence construction. Surveys shall be conducted by the Designated Biologist using techniques approved by the Service and CDFG. Biological Monitors may assist the Designated Biologist under his or her supervision. These surveys shall provide 100% coverage of all areas to be disturbed during fence construction and an additional transect along both sides of the proposed fence line. This fence line transect shall cover an area approximately 90 feet wide centered on the fence alignment. Transects shall be no greater than 15 feet apart. All desert tortoise burrows, and burrows constructed by other species that might be used by desert tortoises, shall be examined to assess occupancy of each burrow by desert tortoises and handled in accordance with USFWS-approved protocol. Temporary exclusion fencing shall be installed around each SCE downstream transmission upgrade site within or adjacent to desert scrub vegetation.

    A. Timing and Supervision of Fence Installation. The exclusion fencing shall be installed prior to site clearing and grubbing. The fence installation shall be supervised by the Designated Biologist and monitored by the Biological Monitors to ensure the safety of any tortoise present.

    B. Fence Material and Installation. The permanent tortoise exclusionary fencing shall consist of galvanized hard wire cloth, 1- by 2-inch mesh sunk 12 inches into the ground, and 24 inches above ground (refer to parameters for USFWS-approved tortoise exclusion fencing at www.fws.gov/ventura/speciesinfo/protocols_guidelines). For temporary exclusion fencing, a "folded bottom" technique shall be implemented. This method follows the same guidelines as installation of permanent fencing except, instead of burying the bottom 12 inches of the fencing, it is bent at a approximately 90 degree angle (to follow the contour of the ground) and spikes or other retaining methods are driven into the ground every 2 linear feet in such a manner as to "anchor" the bottom of the fence. This method eliminates the need for trenching, which, for short-term temporary impacts, may be more beneficial to the recovery of the landscape, and thus the species.

C. Security Gates. Security gates shall be designed with minimal ground clearance to deter ingress by tortoises. The gates shall remain closed except during vehicle passage and may be electronically activated to open and close immediately after vehicle(s) have entered or exited to prevent extended periods with open gates, which might lead to a tortoise entering.

D. Stormwater Drainage Fencing. The onsite stormwater drainage channels, including the headwalls, outlet, and road crossings, shall be permanently fenced to ensure exclusion of desert tortoise during AMS operation.

E. Fence Inspections. Following installation of the desert tortoise exclusion fencing for both the permanent site and stormwater drainage fencing and temporary fencing in the interconnection area, the fencing shall be regularly inspected. Permanent fencing shall be inspected monthly and during/immediately following all major rainfall events. Any damage to the fencing shall be temporarily repaired immediately to keep tortoises out of the site, and permanently repaired within 2 days of observing damage. Inspections of permanent site fencing shall occur for the life of the Project. Temporary fencing must be inspected immediately following major rainfall events. All temporary fencing shall be repaired immediately upon discovery and, if the fence may have permitted tortoise entry while damaged, the Designated Biologist shall inspect the utility corridor or tower site for tortoise.

2. Desert Tortoise Clearance Surveys. Following construction of the tortoise exclusionary fencing around the Plant Site, all fenced areas shall be cleared of tortoises by the Designated Biologist, who may be assisted by Biological Monitors. A minimum of two, 100% coverage protocol clearance surveys with negative results must be completed and these must coincide with heightened desert tortoise activity from April through May and September through October. Non-protocol clearance surveys may be conducted in areas of certainly unsuitable habitat (e.g., developed) with prior approval of specific areas by USFWS and CDFG (these proposed areas shall be identified in the draft Desert Tortoise Plan). To facilitate seeing the ground from different angles, the second clearance survey shall be either walked at 90 degrees to the orientation of the first clearance surveyor use offset transects. Additional clearance survey guidelines are provided in the USFWS *Desert Tortoise Field Manual* (www.fws.gov/ventura/speciesinfo/protocols_guidelines).

3. Translocation of Desert Tortoise. If desert tortoises are detected during clearance surveys within the Project impact area, the Designated Biologist shall safely translocate the tortoise the shortest possible distance to the nearest suitable habitat as described in the Desert Tortoise Plan. If a visibly diseased tortoise is encountered on site, procedures shall be implemented in accordance with the approved final Desert Tortoise Plan.

If a visibly diseased tortoise is encountered on site, procedures shall be implemented in accordance with the approved final Desert Tortoise Plan.

4. Burrow Inspection. All potential desert tortoise burrows within the fenced area shall be searched for presence of desert tortoise. To prevent reentry by a tortoise or other wildlife, all burrows shall be collapsed once absence has been determined, in accordance with the Desert Tortoise Plan. Immediately following excavation and if environmental conditions warrant immediate translocation, tortoises excavated from burrows shall be translocated to unoccupied natural or artificial burrows within the location approved by USFWS and CDFG per the final Desert Tortoise Translocation Plan.

5. Burrow Excavation. Burrows inhabited by tortoises shall be excavated by the Designated Biologist using hand tools, and then collapsed or blocked to prevent re-occupation, in accordance with the Desert Tortoise Plan. If excavated during May through July, the Designated Biologist shall search for desert tortoise nests/eggs. All desert tortoise handling and removal, and burrow excavations, including nests, shall be conducted by the Designated Biologist in accordance with the USFWS *Desert Tortoise Field Manual* (www.fws.gov/ventura/speciesinfo/protocols_guidelines).

6. Monitoring During Clearing. Following the installation of exclusionary fencing and after ensuring desert tortoises are absent from the Project site, heavy equipment shall be allowed to enter the Project site to perform earth work such as clearing, grubbing, leveling, and trenching. A Biological Monitor shall be on site at all times during initial clearing and grading activities. Should a tortoise be discovered, it shall be relocated as described above in accordance with the final Desert Tortoise Plan.

7. Reporting. The Designated Biologist shall record the following information for any desert tortoises handled: a) the locations (narrative and maps) and dates of observation; b) general condition and health, including injuries, state of healing and whether desert tortoise voided their bladders; c) location moved from and location moved to (using Global Positioning System [GPS] technology); d) gender, carapace length, and diagnostic markings (i.e., identification numbers or marked lateral scutes); e) ambient temperature when handled and released; and f) digital photograph of each handled desert tortoise as described in the paragraph below. Desert tortoise moved from within Project areas shall be marked for future identification as described in the USFWS *Desert Tortoise Field Manual* (www.fws.gov/ventura/speciesinfo/protocols_guidelines) and the Desert Tortoise Plan. Digital photographs of the carapace, plastron, and fourth costal scute shall be taken. Scutes shall not be notched for identification.

COMMON RAVEN MONITORING, MANAGEMENT, AND CONTROL

BIO-10 The Project owner shall implement the following measures to manage the construction site and related facilities in a manner to control raven populations and to offset cumulative impacts associated with regional increases in raven numbers:

1. Common Raven Monitoring, Management, and Control Plan. The Project owner shall design and implement a Common Raven Monitoring, Management, and Control Plan that is consistent with the most current USFWS-approved raven management guidelines and that meets the approval of USFWS, CDFG, and Energy Commission staff. The Raven Plan shall do the following:
   A. Identify conditions associated with the Project that might provide raven subsidies or attractants,
   B. Describe management practices to avoid or minimize conditions that might increase raven numbers and predatory activities;
   C. Describe control practices for ravens,
   D. Address monitoring during construction and for the life of the Project, and
   E. Discuss reporting requirements.
2. USFWS Regional Raven Management. The Project owner shall submit payment to a third-party account established by the Service to support a Regional Raven Monitoring and Management Plan. The amount shall be agreed to by staff, USFWS, and the Project owner, and shall be consistent with the level of new raven subsidies potentially resulting from construction and operation of the Project. If raven decreases are anticipated as a result of the Project's removal of subsidies currently in place due to long-term agriculture, then this will be reflected in the in-lieu payment.

3.8 Compensation Lands

The proposed Project includes permanent protection of approximately 118.34 acres of habitat (Compensation Lands) located within a 647-acre parcel west of the Project Area and owned by MSLLC to compensate for potential impacts to DT. The 647-acre parcel includes the following Assessor's Parcel Numbers (APN): 0490-223-07, 0490-223-12, 0490-223-13, 0490-223-29, 0490-223-30, 0490-223-22, and 0490-184-47. Figure 4 shows the location of the property in relation to the Project Area. Approximately 414 acres of the 647-acre parcel is encumbered with

a Flood Runoff Easement.[3] A flood control berm and several wells already exist within the Flood Runoff Easement and, therefore, the easement is not expected to be further developed nor used for any other purpose than floodwater flow. Nevertheless, the portion of the property encumbered by the easement is not considered as a viable portion of the Compensation Lands. Of the 233 acres not encumbered by the Flood Runoff Easement, 118.34 acres is being proposed for compensation.

The 647-acre parcel, except for the northern portion, was surveyed in 2007 and 2008. The northern portion was surveyed during a March 2010 site visit. See Figure 5 for the vegetation communities and special-status species occurrences and signs within the 647-acre parcel. Three vegetation communities exist within the Compensation Lands: Mojave creosote bush scrub, desert saltbush scrub, and Mojave desert wash scrub. The Flood Runoff Easement portion of the parcel also contains some developed lands. The Compensation Lands are entirely located within DT designated Critical Habitat. During 2008 surveys, DT sign was identified in the northwest portion of the Compensation Lands, and reconfirmed during the March 2010 site visit, with one live desert tortoise documented in a burrow (Figure 7). A substantial amount of DT observations and DT sign were identified immediately east of the 647-acre parcel on an 822-acre parcel owned by MSLLC (APN 0490-183-65). The 822-acre parcel is also encumbered by a Flood Runoff Easement; therefore, it is not anticipated that this parcel will be developed. As such, the Compensation Lands will serve to provide linkages between the DT populations observed on the 822-acre parcel and DT Critical Habitat and potential populations located farther west.

The Compensation Lands will be preserved and managed in perpetuity pursuant to a conservation easement to be deeded to a USFWS-approved third-party entity. The ownership of the property will be transferred in fee simple from MSLLC to a USFWS-approved third-party entity who will manage the property in perpetuity pursuant to the terms of the conservation easement.

3.9 Compensatory Mitigation Strategy

As part of the Project, on July 22, 2009, the MSLLC team presented a strategy for the compensation of anticipated Project effects on the federally listed threatened desert tortoise. Based on the anticipated 428.74 acres of allscale vegetation to be disturbed by implementation of

[3] According to a Ground Lease between Luz Development Finance Corporation and Luz Solar Partners LTD dated December 12, 1989, the easement grants the "non-exclusive, non-possessory right to enter upon, use and enjoy, along with LSP VIII, LSP X, LSP XI, LSP XII, and LSP XIII, that certain real property located in the County of San Bernardino, State of California…for the purposes of (A) directing the flow of flood waters over portions thereof, (B) locating, using, constructing and maintaining flood control channels, berms and dikes thereon, and (C) locating, using, constructing and maintaining water wells, water pumps and water pipelines thereon."

the Project (see below), MSLLC would acquire and conserve in-kind habitat of equal or greater value than the habitat impacted. Compensation ratios for DT were determined in consultation with Ashleigh Blackford of the Service and Tonya Moore of CDFG and are detailed in Table 2. Subsequent to the initial discussions with the Service and CDFG, the SCE fiber optic lines were added to the analysis. The proposed SCE component of the Proposed Action would result in the permanent loss of 0.0066 acre (288 square feet) of undisturbed desert saltbush scrub, and the permanent loss of 0.0211 acre (924 square feet) of undisturbed Mojave creosote bush scrub. There would also be an associated temporary loss of 0.11 acre of undisturbed desert saltbush scrub and 0.57 acre of undisturbed Mojave creosote bush scrub. The post-construction revegetation/restoration of the temporary loss of desert scrub vegetation, per Conservation, Minimization, and Avoidance Measure BIO-8, would be self-mitigating. Therefore, temporary loss of habitat is not included in the compensation calculations in Table 2.

Table 2
Proposed Compensation for Effects to Potential Desert Tortoise Habitat

Habitat	Mitigation Ratio	MSP Impact[1] (acres)	SCE Fiber Optic Lines Impact[2] (acres)	MSP Mitigation Acreage	SCE Fiber Optic Lines Mitigation Acreage	Total Mitigation Acreage
Undisturbed desert saltbush scrub	5:1	0.74	0.0066 (288 sq ft)	3. 7	0.03 (1,440 sq ft)	3. 73
Mojave creosote bush scrub	5:1	0	0.0211 (924 sq ft)	0	0.11 (4,620 sq ft)	0.11 acre
Disturbed desert saltbush scrub	2:1	1.3	0	2.6	0	2.6
Disturbed desert saltbush-regrowth	0.5:1	223.8	0	111.9	0	111.9
Fallow agricultural saltbush-regrowth	0:1	202.9	0	0	0	0
Total Mitigation Acreage				**118.2**	**0.14**	**118.34**

[1] The total impact reflects those suitable DT habitat areas within the Project 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 would be required. Acreage represents permanent impact areas. Temporary impacts would be revegetated, per BIO-8, and are assumed to be self-mitigating.

A compensation ratio of 0.5:1 for disturbed DT habitat was based on the following principles:

1. Although the Project is situated among areas identified as important for recovery and management of the DT (Desert Wildlife Management Areas [DWMAs] and federally designated critical habitat), the area occupied and immediately surrounded by the Project

was excluded by those same resource agencies for DT recovery and management based on the standards used to designate the DWMAs and Critical Habitat.

2. The Project Area is an island of mostly agricultural uses that was farmed for several decades and is still partially farmed. At present, there are two solar energy-generating projects operating immediately north of and adjacent to the Project (Harper Lake SEGS). All of the vegetation that would be lost as a result of the Project is highly fragmented by broad expanses of nonhabitat (the center pivot fields), residences, developments, and roads, and/or is regrowth over old farming operations. Therefore, while there is a loss of 428.74 acres of habitable vegetation cover on the MSP site, the quality of this cover for use by DTs is so marginal that it likely does not support DT and would not aid species recovery or maintenance.

3. Surveys in 2006, 2007, 2008, and 2009 found almost no current use of the 428.74 acres potentially impacted (See Figures 6 and 7):

   Western Portion of Alpha Site – Only one DT sign was observed in 2008 – a partial carcass was found in the far southwestern corner at the Project's border. No scat, DTs, or burrows were observed in this area in all other survey years.

   Far Eastern Portion of Alpha Site – One DT was observed in 2006 only. One full carcass of an immature DT, recently dead, and three other groups of carcass parts were found in 2008, but no burrows or scat that would suggest current occupation. Two of these carcasses were found again in 2009.

   Beta Site and Middle Portion of Alpha Site – No evidence of current use was found in the center pivot corners or regrown parking area in the middle portion of the Alpha site during all survey years. A carcass was found in the center pivot in 2007 and another carcass near the northern border of the Alpha site in 2009. One old (white) scat was found in 2009 approximately 650 feet from the southern border of the Beta site, indicating that a DT walked onto the barren, abandoned agricultural field within the last several years. Nine shell fragment groups were also found in 2009, at least seven of which were only one to several fragments. Several showed broken bones, suggesting depredation or scavenging. Eight were estimated to be at least 4 years old. This accumulation of data, without corroborating evidence of occupation of these areas, suggests that most of these carcasses or carcass parts were transported by predators or, in a couple of cases, were DTs that entered the field during previous farming operations and were killed.

4. Increases in ravens would not be expected due solely to the Project because the Project adds no raven subsidies that are not already present (e.g., trees [nesting and roosting

sites], evaporation ponds, perches); in fact, existing subsidies due to agriculture will be eliminated.

5. The Project does not block movement of animals within the population for purposes of genetic dispersal (i.e., a corridor). The small area in the far eastern portion of the Alpha site is characterized by halophytic vegetation and periodic inundation; it is not DT habitat. There is ample open space south and west of the Project Area for movement and genetic flow to occur.

Positive Benefits to Desert Tortoise

1. The Project removes the mortality sink represented by the scenario of agriculture adjacent to native, occupied DT habitat. On a few projects, DTs have been observed drinking from pools created by leaky irrigation pipes along the edges of crops and also to forage along the edges of crops, especially alfalfa. Despite several 100 percent surveys in fields on which crops are actively growing, no DT burrows have been observed in the crop fields (Becky Jones, DFG, pers. comm. to Alice Karl), so it is assumed that those DTs entering the crop field edges to forage and drink actually reside in the adjacent native habitat.

    i) During typical mowing or ground preparation, many animals are killed or injured. Tortoises entering the fields to forage or drink would also be subject to this hazard. As such, agriculture should be viewed as an attractive nuisance. The Project will remove this attractive nuisance.

    ii) Removal of subsidies for ravens (leaky irrigation pipes, food) will reduce raven populations on and adjacent to the Project. Many animals (rodents, birds, and others) injured or killed by farming operations (e.g., mowing and ground preparation) are commonly scavenged by hawks and ravens, which monitor mowing and tilling operations (Alice Karl, pers. obs.). Removal of agriculture from this area would remove significant agriculturally-based food for ravens, as well as water sources associated with irrigation.

    iii) Removal of other DT predators (dogs and feral cats) associated with farm residences.

In summary, removal of agriculture would benefit DTs, including those in the surrounding habitats that have been identified by the resource agencies as important conservation areas.

4.0 THREATENED, ENDANGERED, PROPOSED THREATENED, OR PROPOSED ENDANGERED SPECIES AND CRITICAL HABITAT IN THE ACTION AREA

The Project has the potential to affect a single species that is a threatened, endangered, proposed threatened, proposed endangered, or candidate species, as well as any designated or proposed critical habitat, under the jurisdiction of USFWS, the DT, Mojave Desert Population, which is listed as threatened.

4.1 Relevant Policy and Management Direction

4.1.1 Desert Tortoise Recovery Plan

USFWS approved and issued a recovery plan for the DT in 1994 and identified proposed Desert Wildlife Management Areas (USFWS 1994b). DWMAs had no specific legal boundaries in the 1994 Recovery Plan; rather, they were identified as areas recommended for preservation to the land management agencies. Subsequently, BLM formalized the recommended DWMAs from the 1994 Recovery Pan through its planning process and administers them as Areas of Critical Environmental Concern (see discussion of BLM plans, below). The 1994 Recovery Plan also identified Recovery Units. The MSP is located in the Western Mojave Recovery Unit. It includes the central, southwestern, south-central, and part of the northern Mojave Desert regions. The 1994 Recovery Plan recommended a recovery strategy involving a formalization of the DWMAs within the Recovery Units and implementation of recovery actions within the DWMAs to provide for the "long-term persistence of viable desert tortoise populations and the ecosystems upon which they depend" (USFWS 1994b).

A revised recovery plan was drafted in 2008 to reevaluate the status of the population, and threats to the population, and to identify measures to reduce uncertainties about species threats and management and improve recovery potential (USFWS 2008). Elements of critical importance identified for desert tortoise recovery and persistence include adult survivorship; maintenance of genetic and ecological variability within and among populations; and the long-term persistence of extensive, unfragmented habitat. The Draft Revised Recovery Plan identifies an approach to recovery that is based on the following six strategic elements:

1. Develop, support, and build partnerships to facilitate recovery.
2. Protect existing populations and habitat, instituting habitat restoration where necessary.
3. Augment depleted populations in a strategic manner.

4. Monitor progress toward recovery.
5. Conduct applied research and modeling in support of recovery efforts within a strategic framework.
6. Implement a formal adaptive management program.

The Draft Revised Recovery Plan also provides a list of habitat enhancement and management activities that would support recovery of DT, including the following actions:

- Protect intact DT habitat.
- Restore DT habitat.
- Secure lands/habitat for conservation.
- Connect functional habitat.
- Reduce excessive predation.
- Contribute to the DT head-starting program or translocation programs.
- Monitor DT distribution in each recovery unit.
- Track changes in quantity and quality of DT habitat.
- Determine factors that influence the distribution of DT.
- Conduct research on the restoration of DT habitat.
- Conduct research on DT diseases and their effects on populations.

4.1.2 Desert Tortoise Critical Habitat

USFWS designated critical habitat for the DT pursuant to the Federal ESA in 1994 based on the recommended DWMAs in the 1994 Recovery Plan. Critical Habitat Units are specific, legally defined areas that USFWS has identified as essential for the conservation of the DT. The Critical Habitat Units support physical and biological features, defined as primary constituent elements that are essential for DT survival and that may require special management considerations or protection. The Western Mojave recovery unit includes the Fremont-Kramer, Superior Cronese, and Ord-Rodman Critical Habitat Units, which roughly correspond to the recommended DWMAs. The Fremont-Kramer Critical Habitat Unit is located immediately west of the Project Area and the Superior-Cronese Critical Habitat Unit is located north and east of the Project Area. The proposed Compensation Lands for the Project are located within the Fremont-Kramer Critical Habitat Unit. The Superior-Cronese Critical Habitat Unit (CHU) designated for DT is located approximately 0.7 mile southwest of the Project Area.

4.1.3 California Desert Conservation Area Plan

The Federal Land Policy and Management Act (FLPMA) requires BLM to develop land use plans (i.e., Resource Management Plans), to guide BLM's management of public land. Pursuant to FLPMA, the California Desert Conservation Area (CDCA) was established and serves as a guide for the management of all BLM-administered lands in three desert areas: the Mojave, the Sonoran, and a small portion of the Great Basin (BLM 1980, as amended in 1999). The CDCA Plan covers approximately 25 million acres, of which 12 million are public lands. The primary goal of the CDCA Plan is to provide overall maintenance of the land while planning for multiple uses and balancing the needs of people with the protection of the natural environment. The CDCA was subsequently amended by region, generally corresponding to the recovery units identified in the 1994 Recovery Plan. The West Mojave Management Plan (BLM et al. 2005) was developed for the West Mojave Recovery Unit.

4.1.4 The West Mojave Management Plan

The West Mojave Management Plan (WEMO) is an amendment to the CDCA that formally designated the four DWMAs recommended in the 1994 Recovery Plan and 11 additional species and habitat-based conservation areas. The WEMO stipulates new management measures for the DT and other special-status species to be implemented within public lands and the DWMAs. The WEMO is a landscape-scale, multiagency planning effort that protects and conserves natural resources while simultaneously balancing human uses of the region. WEMO provides reserve management for DT, integrated ecosystem management for special status-species and natural communities for all Federal lands, and regional standards and guidelines for public land health for BLM lands.

The objective of the DWMAs is to address the recovery of DT in addition to several other sensitive species occurring in the planning area. Some additional use restrictions in these areas apply, but emphasis is placed on minimizing disturbance and maximizing mitigation, compensation, and restoration from authorized allowable uses. The WEMO requires fee-based compensation for disturbance to public lands at the ratio of 5 acres of compensation for every 1 acre of impact (5:1) within Habitat Conservation Areas (HCAs), at a ratio of 0.5:1 in areas outside HCAs that fall within WEMO-designated disturbed habitat, and at a ratio of 1:1 elsewhere. Compensation is to be directed to the recovery unit where the disturbance occurs. Additionally, new surface disturbance on lands administered by Federal agencies within any DWMA would be limited to 1 percent of the Federal portion of the DWMA. These compensation requirements do not apply to the MSP because the Project Area is located on privately held lands.

The Project Area is located immediately north of the Superior-Cronese DWMA, as designated by WEMO. The Project Area is also located immediately east of the Fremont-Kramer DWMA. The SCE fiber optic lines travel along existing transmission corridors through portions of these DWMAs.

Harper Dry Lake Ecological Preserve, a Watchable Wildlife Area managed by BLM and encompassing the dry lake bed and its periphery, is located northeast of the MSP site. BLM-managed land in the surrounding area is classified by the WEMO as "L-Limited Use" under the multiple-use land use classification system. The WEMO also designates a portion of the nearby Harper Dry Lake as an Area of Critical Environmental Concern (ACEC), encompassing approximately 480 acres located approximately 0.12 mile east of the Project site.

4.1.5 Desert Renewable Energy Conservation Plan

The State of California Governor's office recently signed an MOU with the U.S. Department of Interior to cooperatively develop long-term renewable energy plans and to streamline eligible projects through State and Federal permitting processes. The MOU establishes the Desert Renewable Energy Conservation Plan (DRECP) process, which is a science-based process for reviewing, approving, and permitting renewable energy applications in California. Once the plan is complete (anticipated in late 2010), it will present a regional road map that will provide certainty for renewable energy developers on how and where to site their projects. The DRECP will also create a government-organized habitat mitigation program that consolidates habitat purchases for compensatory mitigation.

4.2 Species Accounts

The DT is federally listed as threatened under the ESA (USFWS 1990), with critical habitat designated by USFWS (USFWS 1994a). This listing status applies to the entire population of DT, except in Arizona south and east of the Colorado River, and in Mexico. An approved recovery plan has been published by USFWS (1994b). However, USFWS formed the Desert Tortoise Recovery Office and published a draft revision to the Recovery Plan (USFWS 2008). The DT was also listed as threatened under the California Endangered Species Act on June 22, 1989 (California Fish and Game Commission 1989). The species is also covered under the WEMO (BLM 2005).

The MSP lies in the Western Mojave Recovery Unit, which includes the Joshua Tree, Ord-Rodman, Superior-Cronese, and Fremont-Kramer DWMAs (USFWS 2008). The population

densities within each of the Western Mojave Recovery Unit DWMAs are highly variable, but overall, the DT population has steadily decreased since monitoring efforts began. Recent density estimates for DT within the four Critical Habitat Units (associated with the four DWMAs) indicated that as many as 20,420 to 41,224 adult DTs occur in the western Mojave Desert (Heaton et al. 2004, as cited in USFWS 2006).

4.2.1 Habitat Status

Suitable landscapes for DT are generally defined as alluvial fans and plains and rocky slopes at elevations of 1,969 to 3,937 feet above sea level, but DT are known to range from below sea level to 7,300 feet in elevation (USFWS 2008). Presence of ephemeral plant species is an indicator of habitat suitability for the DT because these species are the primary components of the tortoise diet (Esque 1994; Jennings 1997; Avery 1998). Generally DTs prefer creosote bush scrub habitat with a high diversity and cover of perennial plant species and high productivity of ephemeral plants. Less commonly, DT will occur in blackbrush (*Coleogyne ramosissima*), Joshua tree (*Yucca brevifolia*), and juniper (*Juniperus* sp.*)* at higher elevations, and saltbush (*Atriplex* sp.) at lower elevations (Nussear et al. 2009). DTs require soils that are firm enough to support burrows but also friable enough to allow for burrow excavation (Anderson et al. 2000). In some cases, DTs take advantage of existing natural shelters such as rock formations or exposed calcic soils horizons (Nussear et al. 2009).

DTs are most active when plants are available for forage or when pooled water is available for drinking; they are usually most active in early March through early June and again between September and early November. They typically have home ranges from under 25 to 200 acres (USFWS 2008). Individuals commonly traverse 1,500 to 2,600 feet per day within their home range and males have been recorded to travel 0.6 mile within their home range (Berry 1986). DTs are also known to disperse extended distances such as 2.0 miles in 16 days and 4.5 miles in 15 months (Berry 1986). DTs require 13 to 20 years to reach sexual maturity and have low reproductive rates (USFWS 2008); however, individuals can live 50 to 100 years and have a long period of reproductive potential.

This widespread and once common species is rapidly declining in numbers due to various factors, including the spread of a fatal respiratory disease; increases in raven populations that prey on juvenile tortoises; mortality associated with roads and off-highway vehicle use; and habitat destruction, degradation, and fragmentation. The Western Mojave Recovery Unit is considered to be one of the most threatened recovery units for DT (USFWS 1994b). Adult DT population densities have shown a significant downward trend throughout the western Mojave Desert in the last several decades (Tracy et al. 2004).

5.0 ENVIRONMENTAL BASELINE CONDITIONS

5.1 MSP Project Area

The MSP Project Area, which includes the SCE Lockhart Substation and Interconnection Facilities, consists primarily of abandoned agricultural fields that had center-pivot-type irrigation systems, one of which is still in use for alfalfa production. Historically, land in and around the Project has been used to produce alfalfa and for cattle ranching and dairy farming. Currently, alfalfa is being grown within a center pivot field located in the northwestern section of the planned Beta site (Figure 2a). Anthropogenic disturbance to the Project Area has occurred for several decades; however, some areas (disturbed, fallow agricultural, or livestock pens) have been recolonized primarily by allscale (*Atriplex polycarpa*; herein referred to as saltbush scrub regrowth) and cover approximately 430 acres of the 1,765-acre Project Area.

In the Mojave Desert, the DT is most often found in association with creosote bush, Joshua tree woodland, and saltbush scrub. Within the MSP Project Area boundary, saltbush scrub currently exists, but creosote bush scrub and Joshua tree woodland do not (Figure 6). A small area of saltbush scrub and disturbed saltbush scrub currently exist on site (less than 2 acres) in the northeastern edges of the Project Area (Figure 6).

The alfalfa field that is currently in use may be a minor attractant for DT along its edges by providing vegetation and, at times, ponded water for consumption. Other than this unnatural source of food and water, there is mainly poor-quality DT habitat or no habitat within the Project Area. Conversely, adjacent to the Project Area, directly east, west, and south are thousands of continuous acres of good-quality DT habitat consisting of desert wash scrub, creosote bush scrub, and saltbush scrub.

Desert Tortoise Survey Methods

DT surveys were conducted in April and May in 2007, 2008, and 2009, according to USFWS DT survey protocol (USFWS 1992), which requires surveys of all areas determined to have appropriate habitat for DT using belt transects less than or equal to 30 feet wide to afford 100-percent visual coverage. In addition, Zone of Influence (ZOI) transects were surveyed. A ZOI is defined as the area where DT on adjacent lands may be affected directly or indirectly by Project development. At a minimum, a single, 30-foot-wide ZOI transect is located at 100, 300, 600, 1,200, and 2,400 feet from and parallel to the edge of a Biological Resources Survey Area

(BRSA) or Project Area[4] boundary. All DT sign (shells and shell parts, scat, burrows, pallets, tracks, egg shell fragments, courtship rings, drinking sites, etc.) within the BRSA or Project Area and along ZOI transects require mapping. In addition to the five ZOI transects required by USFWS protocol, two additional transects were walked at 3,960 feet and 5,280 feet from and parallel to the edge of the BRSA or Project Area boundary per CEC Draft Survey Guidelines.

Surveyors slowly and systematically walked transects while visually searching for DT and sign. All DT sign detected within the Survey Area was mapped using GPS units and associated data were recorded onto field data sheets. Particular emphasis was placed on searching around the bases of shrubs and along the banks of shallow washes. The lakebed of Harper Dry Lake was not considered suitable DT habitat due to lack of food sources, moisture, and shade, and therefore was not surveyed; however, surveyors did visually scan the barren landscape for signs of life (animal or plant). In addition, other botanical and wildlife surveys were conducted in this area per the CEC Draft Survey Guidelines, and any DT sign incidentally detected during those surveys was recorded.[4] DT size was estimated at middle carapace length (MCL) and DTs were visually evaluated for health. Carcasses were aged, measured (if possible), and classed using Dr. Alice Karl's *Key to Sign Classes* classification system (see Appendix C, Attachment 9). Height and width of DT burrow openings and length and depth of burrows were recorded. 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.

Desert Tortoise Survey Results

Results of DT reconnaissance and focused protocol surveys for the Project revealed that very few DTs utilized the Project Area over a 4-year period (Figure 5). In 2006, the only DT observed within the Project Area was detected near an existing ranch property and was thought to be a pet of the ranch owner (William Clark pers. comm. 2009). No other DTs were documented within the Project Area during subsequent focused protocol-level surveys in 2007, 2008 or 2009 (Figure 5).[5]

[4] As noted above, the Project Area changed from 2007 to 2009; therefore, the locations of the ZOI transects were shifted accordingly to accommodate new Project boundaries. For example, the ZOI transects were located around the BRSA during surveys in 2007 and were located around the Project Area during surveys in 2008.

[5] One female DT was observed twice near and within one of the ranches located in the Project Area (corner of Edie Road and Lockhart Road) during reconnaissance surveys in 2006 (EREMICO, 2006); however, this DT may have been preyed upon by dogs residing at the home as it was not seen during 2007 or 2008 surveys. It is speculated that this particular tortoise may have been kept as a pet by the land owner (pers. comm. William Clark 2009).

In addition, only two DT observations occurred within 1,000 feet of the Project Area. In 2006, one DT was observed approximately 700 feet south of the Project Area (south of the Beta site and near an active alfalfa field) (EDAW 2006). In 2008, a DT was also observed approximately 500 feet southeast of the Project Area (Figure 5). Overall, these three (3) DTs (one within the Project Area and two within the buffer) were the only DT individuals observed in close proximity (within 1,000 feet) of the Project Area. The remainder of DTs observed during Project surveys were observed to the west and east of the Project Area (Figures 7). In 2008, the nearest DT observation occurred over 2,250 feet from the Project Area boundary. West of the Project Area boundary, the nearest observation of DT in 2008 was over 2,300 feet away. The closest occurrences to the Project Area occur to the south while DT observations to the east and west are farther away from the Project Area.

Other DT sign detected within the Project Area (burrows, scat, etc.) consisted mainly of DT carcasses or shell fragments (Figure 4). A majority of DT sign occurs directly east and west of the Project Area. Based on 3 consecutive protocol-level survey years and an analysis of the survey data collected, the potential for DT within the Project Area was determined to be low.

5.2 SCE Telecommunication Facilities

Although the proposed fiber optic lines extend across vegetation community types that can be used by the desert tortoise, the routes are located along and adjacent to either developed areas (e.g., paved roads) or highly disturbed corridors (e.g., existing transmission rights-of-way). The potential desert tortoise habitat along the fiber optic routes are already under pressure from existing edge effects associated with human activity and habitat fragmentation along the developed and disturbed roads and rights-of-way. All of the permanent and temporary impacts to potential desert tortoise habitat would occur at the periphery of these patches of vegetation.

Lockhart to Tortilla Substation Fiber Optic Line

Dominant vegetation communities and cover types within the Lockhart to Tortilla Substation Fiber Optic Line corridor include desert saltbush scrub, Mojave desert creosote bush scrub *Ambrosia dumosa*-dominant, fallow agriculture-ruderal, active agriculture, Mojave desert wash sandy areas, tamarisk scrub, and the Mojave River. The distribution of these cover types are described below and depicted in Figure 6b, Lockhart Substation to Tortilla Substation.

This segment of fiber optic line leaves the Lockhart Substation within the MSP footprint and heads west along the existing Kramer–Coolwater 220-kV transmission line utility corridor (Figure 6b). The north side of this utility corridor section is characterized by disturbed desert

saltbush scrub habitat. The south side is characterized by native Mojave desert creosote bush scrub dominated by creosote bush and white bursage (*Ambrosia dumosa*) habitat. In previous years along the south side, a desert tortoise was observed on two separate occasions and additional desert tortoise signs were also recorded.

Where the alignment intersects Harper Lake Road it then heads south for 400 feet of new underground cable. The vegetation along the 400-foot section is disturbed near the abandoned residential development adjacent to Harper Lake Road on the west side. After the underground section, the alignment continues south approximately 5 miles along Harper Lake Road. The vegetation here is predominantly relatively undisturbed native saltbush scrub habitat outside of the tortoise-proof fencing that follows both sides of Harper Lake Road. This habitat is characterized by *Atriplex* species including shadscale (*Atriplex confertifolia*), allscale, spinescale (*Atriplex spinifera*), winter fat (*Krascheninnikovia lanata*), horsebush (*Tetradymia canescens*), and creosote bush. On the inside of the Harper Lake Road fence, vegetation is highly disturbed and poor quality habitat.

At the Harper Lake Road junction with SR 58, the fiber optic alignment heads east along the north side of SR 58 for approximately 10 miles to Summerset Road. Vegetation is predominantly undisturbed desert saltbush scrub on the north side of the tortoise-proof fence for approximately 5 miles. Along the western 5 miles of the SR 58 section, disturbed desert saltbush scrub and developed habitat are intermittently dispersed. At Summerset Road, the alignment turns south and follows adjacent fallow agricultural fields to Community Road where it turns east for approximately 2 miles to Lenwood Road. Abandoned and active agricultural fields are adjacent to Community Road until within one-quarter mile of Lenwood Road, where the habitat becomes predominantly sand dunes.

At Lenwood Road, the fiber optic alignment turns south for almost 3 miles. The habitat over the first 2 miles is dominated by sand dunes, areas of tamarisk, Russian thistle, several *Atriplex* and *Brassica* species, and the Mojave River. One-half mile north of west Main Street, the habitat becomes disturbed native vegetation, predominantly creosote, and commercial and residential development.

Beyond Lenwood Road, for 2,000 feet along Sun Valley Drive, disturbed native habitat continues south to the SCE Ordway Substation, where the alignment turns northeast and follows an existing SCE Poco 33-kV pole line for almost 5 miles. The habitat through this section is alternately disturbed native vegetation, predominantly creosote bush scrub, and residential development. At I Street, the alignment turns south through residential development mixed with disturbed native vegetation, crosses Interstate 15 (I-15), and continues through residential areas mixed with native vegetation to Bonanza Street, where it turns east on Bellflower.

After exiting the residential area off Bonanza Road, the alignment continues southeast along SCE's existing Kramer–Tortilla 115-kV right-of-way. The habitat here is disturbed creosote bush scrub with extensive off-highway vehicle (OHV) use and garbage dumping; this habitat type includes the area where the cable would be placed in an existing underground conduit. The alignment ends at the Tortilla Substation, which is graded and denuded.

Lockhart to Kramer Substation Fiber Optic Line

Dominant vegetation communities and cover types within the Lockhart to Kramer Substation Fiber Optic Line corridor include desert saltbush scrub, Mojave desert creosote bush scrub *Ambrosia dumosa* dominant, Mojave desert creosote bush-*Ambrosia dumosa-Atriplex* scrub, fallow agriculture-ruderal, active agriculture, and developed areas. The distribution of these cover types are described below and depicted in Figure 6c, Lockhart Substation to Kramer Substation.

The initial portion of this fiber optic line occurs within the footprint of the MSP as described above in the Lockhart Substation and Interconnection sub-section. From where this alignment turns south on Harper Lake Road, the alignment diverges from the established footprint of the MSP (Figure 6c). For 1 mile along Harper Lake Road, vegetation is characterized primarily by disturbed desert saltbush scrub, with a short section of developed residential property. The area surrounding this section of Harper Lake Road north of the residence had previously been surveyed for desert tortoise as part of the MSP site surveys. No recent tortoise sign was found. The one-quarter mile of desert saltbush scrub habitat south of the residence is similar to desert saltbush scrub habitat on the east side of Harper Lake Road, which also had been surveyed in previous years without detecting any tortoise sign.

The fiber optic line turns west along the existing Kramer–Coolwater 220-kV transmission line utility corridor for approximately 12 miles to Highway 395 near Kramer Junction. Along this relatively undisturbed section of the fiber optic alignment, the habitat varies in dominant species. The lower elevation depressional areas are dominated by desert saltbush scrub characterized by *Atriplex* species and including shadscale, allscale, spinescale, winter fat, horsebush, and creosote bush. Relatively higher elevation areas include Mojave creosote bush scrub with creosote bush and white bursage. Mojave desert wash scrub areas were composed of cheesebush (*Ambrosia solsola*), Anderson's boxthorn (*Lycium andersonii*), and peachthorn (*Lycium cooperi*). Toward the western end of the alignment, within 2 to 3 miles of Highway 395, Joshua trees (*Yucca brevifolia*) become more numerous.

On the west side of Highway 395, the fiber optic alignment enters a highly disturbed area that is predominantly denuded of vegetation with an occasional creosote bush, and then heads south. The alignment crosses SR 58 near a truck stop parking area and subsequently enters into the Kramer Substation, which is denuded of vegetation.

Kramer to Victor Substation Fiber Optic Line

Dominant vegetation communities and cover types within the Kramer to Victor Substation Fiber Optic Line corridor include desert saltbush scrub, Mojave desert creosote bush scrub, Mojave desert creosote bush scrub *Ambrosia dumosa*-dominant, developed areas, disturbed habitat, and Joshua tree woodland. The distribution of these cover types are described below and depicted in Figure 6d, Kramer to Victor Substation.

From the substation at Kramer Junction, the alignment heads south parallel to the west side of Highway 395 following the existing utility corridor access road. For approximately 19 miles, the vegetation is predominantly undisturbed Mojave desert creosote bush scrub with white bursage habitat, interspersed with discrete patches of desert saltbush scrub and Joshua tree woodlands. For most of this segment, the habitat is comparatively undisturbed; the disturbance that does occur is primarily associated with access roads that traverse west from Highway 395.

Nineteen miles south of Kramer Junction, where the fiber optic alignment joins SCE existing structures for the remaining alignment distance, the habitat continues as described above until Bellflower Road. Here the alignment diverges from Highway 395 and continues along residential streets to Bartlett Avenue. At Bartlett Avenue, the alignment turns eastward along the residential street to Highway 395 and turns south again, paralleling the highway.

South of Bartlett Avenue, the alignment is dominated by mixed commercial and residential development with intermittent disturbed native vegetation. Approximately 0.5 mile south of Bartlett Avenue, there is little to no development on the west side of Highway 395 and the vegetation is disturbed desert creosote scrub, sparsely vegetated with creosote bush and white bursage. At the intersection with Palmdale Road, the alignment turns east. For 0.5 mile along Palmdale Road the habitat is disturbed, and continues for 1,200 feet where the proposed cable would be placed in an existing underground conduit the rest of the way to the Victor Substation.

5.3 MSP Proposed Compensation Lands

The existing environment at the proposed compensation site consists primarily of desert saltbush scrub vegetation, bisected by a band of Mojave creosote bush scrub vegetation, approximately 1

mile to the west of the western Project boundary, and within the Superior-Cronese Critical Habitat Unit for DT (Figures 5 and 6). A small portion of the compensation site was included in the Project's initial focused biological survey area. A larger portion of the compensation site is located within the Project's initial 1-mile CEC biological survey buffer. In March 2010, an additional site survey was conducted to supplement the vegetation mapping for the site, and to assess the suitability of the site for desert tortoise and other biological resources. Although no live desert tortoises were observed on the small portion of the compensation site where protocol-level surveys were conducted, a large amount of tortoise sign was documented within the focused survey area and buffer area immediately adjacent to the proposed compensation area (Figure 7). Additionally, one live desert tortoise was observed in a burrow on the northern portion of the compensation site during the March 2010 site visit (Figure 7).

6.0 EFFECTS OF THE ACTION

6.1 MSP Project Area

Project construction activities in areas of potentially suitable habitat could result in disturbance to and/or loss of individual DTs. The proposed Project also would result in permanent loss of potential DT habitat. The sections below discuss these potential impacts.

Direct Impacts to Desert Tortoise

Direct permanent impacts to DT are possible because evidence of DT was observed within the proposed Project Area during surveys. Little recent evidence of DTs (e.g., DTs, scat, or burrows) was found in the Project Area; however, carcass parts were observed during surveys in 2007 through 2009. During 2006 reconnaissance surveys, one DT was encountered in the eastern portion of the Alpha site, near a ranch house (EREMICO 2006). This sighting was in a disturbed area that had been recolonized by saltbush shrubs. During surveys, DTs were observed adjacent to the Project Area and therefore could wander onto the site and also construct burrows, and thereby be subject to take. This would be most likely to occur in the vegetated corners of the center-pivot fields where native habitat exists outside of the Project Area, for example, in the western edge of the Alpha site, or the eastern edge of the Beta site.

Direct permanent impacts to DT could potentially occur as a result of habitat loss due to MSP construction. This would include impacts to 428.74 acres within the Project Area, composed mainly of fallow agricultural and disturbed areas that have a prevalence of saltbush scrub regrowth (Figure 6a; Table 3). 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 east of Harper Lake Road on all disturbed, developed, fallow agricultural, and active agricultural lands, as well as the corners of center-pivot agricultural fields, none of the Project Area is considered to be occupied DT habitat. Allscale is a native Mojave Desert shrub that is known for becoming established on previously disturbed lands. Within the Project Area, allscale has formed monotypic stands on lands disturbed by agricultural activities. Table 4 indicates the acreages of three vegetation types with an allscale component that are found within the Project Area that will be impacted.

Table 3
Impacts to Potential Desert Tortoise Habitat within the MSP Project Area

Vegetation Type	**Permanent Impact Acreage[1]**
Disturbed−Saltbush Scrub Regrowth	223.8
Desert Saltbush Scrub	0.74
Fallow Agricultural−Saltbush Scrub Regrowth	202.9
Disturbed Desert Saltbush Scrub	1.3
Total Acreage	**428.74**

[1] The entire MSP footprint would be permanently developed, and therefore, no temporary disturbance would occur.

Table 4
Impacts to Potential Desert Tortoise Habitat within the SCE Fiber Optic Line Corridors

Vegetation Type	**SCE Fiber Optic Line Corridor Permanent Impact Acreage**	**SCE Fiber Optic Line Corridor Temporary Impact Acreage**
Desert Saltbush Scrub	0.0066 (288 sq ft)	0.11
Mojave Creosote Bush Scrub	0.0211 (924 sq ft)	0.02
Mojave Creosote Bush Scrub−*Ambrosia dumosa* dominant	0	0.55
Total Acreage	**0.0278 (1212 sq ft)**	**0.68**

Direct impacts to DT could result from vehicle strikes due to an increase in vehicle traffic while the Project is under construction and operation. This could occur on Harper Lake Road and other access roads used for construction and operation.

There would be no direct impact to DT designated critical habitat because the proposed Project is not located within designated critical habitat for DT.

Project design features and avoidance measures, especially site fencing and a preconstruction DT clearance, will minimize potential direct impacts to DT as a result of MSP activities. While it is anticipated that there would be no or very few DT on the Plant Site, any DT found on the site during clearance surveys would remain in the population by being placed into viable DT habitat, immediately outside of the DT-proof fencing, but on MSLLC property. Because moving DTs from the Project Area would be considered "take," this permit application seeks inclusion of this activity in the take authorization. Implementation of the impact conservation measures, as well as the mitigation and compensation strategy outlined above, will reduce and fully mitigate the MSP's direct impacts to DT.

Indirect Impacts to Desert Tortoise

Indirect impacts to DT that were assessed included the possibility of common raven predation associated with the installation of evaporation ponds and the introduction of new elevated perching sites (e.g., powerline poles). Although the existing evaporation pond at the Harper Lake SEGS serves as a potential raven subsidy, the addition of identical subsidies for the MSP is not likely to result in a large increase in the raven population, but it may result in an incremental increase due to the addition of water. However, the Project is likely to have a substantial net-benefit to DTs by removing common raven subsidies that currently exist due to agriculture (e.g., freshwater, rodents, rodents and rabbits killed during harvesting). In addition, the Applicant will avoid and minimize potential impacts to DTs from ravens through implementing a raven monitoring and control plan and/or contributing to USFWS's regional raven monitoring and management programs, as stipulated in the conservation measures above.

The MSP will have little to no effect on hydrology in desert tortoise habitat. Desert tortoise habitat generally only occurs upstream of the MSP site. There is a small amount of remnant saltbush scrub in Section 28 that may be occupied by tortoises, although there was no evidence of tortoise use during all surveys. The natural hydrology that supports this area has been cut off by agriculture for many decades. The MSP design will return flows to this area. Erosion from the site that could affect sediment deposition into this area would be minimized by grading, compaction, and other surface amendments. There is no designated critical habitat downstream of the Project that would be affected by altered flows.

The Project Area will not create a further impediment to normal movements or gene flow. The small area in the eastern edge of the Alpha site along Harper Dry Lake is characterized by halophytic vegetation and periodic inundation; therefore, it is likely not occupied DT habitat. There is ample uninterrupted, higher quality, occupied habitat south and west of the Project Area for movement and genetic flow to occur within the DWMAs and designated critical habitat.

Implementation of the impact conservation measures, as well as mitigation strategies, outlined above, will reduce and fully mitigate the MSP's indirect impacts to DT.

6.2 SCE Telecommunication Facilities

Construction activities in areas of potentially suitable habitat along the fiber optic routes could result in disturbance to and/or loss of individual DTs. The proposed construction also would result in permanent loss of potential DT habitat (Table 4). The sections below discuss these potential impacts.

Lockhart to Tortilla Substation Fiber Optic Line

Desert tortoise habitat exists in desert saltbush scrub scattered along the existing utility corridor from Harper Lake Road to SR 58, to the intersection of Harper Lake Road and SR 58, east to Summerset Road. There is tortoise-proof fence along this section of the alignment. As the habitat becomes increasingly more developed and disturbed approaching Summerset Road and the remaining stretches preceding the Tortilla Substation, the likelihood of encountering a desert tortoise is reduced.

Direct permanent impacts to DT are possible because evidence of DT (live tortoise and other sign such as burrows and scat) was observed south of the MSP during surveys for the proposed solar facility, in the vicinity of where the fiber optic line would exit the MSP site. Direct permanent impacts to DT could potentially occur as a result of habitat loss due to construction of the proposed segment of new overhead line and associated poles, as well as from a small area of trenching associated with an underground segment of fiber optic cable. This would include impacts to approximately 0.23 acre of Mojave creosote bush scrub-*Ambrosia dumosa* habitat that would be temporarily impacted from 500 feet of trenching where there is existing underground cable. Approximately 110 square feet (less than 0.01 acre) of desert saltbrush scrub would be permanently impacted, and 0.04 acre would be temporarily impacted, from the installation of 55 new poles. Temporary construction impacts associated with cable stringing are expected to be minor; however, these will be assessed once preliminary engineering identifies equipment locations. These areas of potentially occupied desert tortoise habitat are at an interface with developed areas and disturbed habitat, and encounters with desert tortoise within the construction disturbance area would be expected to be avoidable through the effective implementation of the proposed impact avoidance and minimization measures, such as the use of temporary desert tortoise exclusion fencing or monitoring.

Lockhart to Kramer Substation Fiber Optic Line

Although no new construction is proposed for this portion of the fiber optic routes, DT and potential tortoise habitat along this alignment begins at Harper Lake Road, then heads west along the existing Kramer–Coolwater 220-kV transmission line corridor. The vegetation communities along this 12-mile section are relatively undisturbed and intact. The likelihood of a DT encounter is supported by the survey data collected for the analysis of the MSP site, which documents a healthy desert tortoise population to the north of this utility corridor. The likelihood of desert tortoise encounter is considered comparatively high here, given the relatively remote location of this utility corridor and relative absence of definitive human-influenced mortality factors that often reduce population densities.

Once the alignment approaches the Kramer Junction intersection of highways and the developed substation, the desert tortoise population density is likely to be lower, effectively reducing the likelihood of a desert tortoise encounter.

The temporary disturbance of Mojave desert scrub habitat as a result of cable stringing on existing poles would require the implementation of the pertinent conservation, avoidance, and minimization measures previously outlined, including the use of temporary desert tortoise exclusion fencing around any work areas required for fiber optic cable pulling, as well as adequate monitoring of construction activities.

Kramer to Victor Substation Fiber Optic Line

The vegetation communities from south of Kramer Junction represent areas of relatively higher quality desert tortoise habitat, compared to portions of more urban development south of Bellflower Street. This entire stretch parallel to Highway 395 of comparatively undisturbed habitat could support low-density tortoise populations due to the proximity of the area to Highway 395.. Where access roads traverse west off of Highway 395, there is a higher occurrence of human impact and vehicular mortality to tortoises.

Once the alignment reaches the residentially developed area from Bellflower Street south to the Victor Substation, the likelihood that a desert tortoise population persists is lower. Probability of tortoise encounter is considerably lower along this stretch, with tortoise populations possibly near extirpation from human activity in or near the remaining patches of native desert vegetation.

Direct impacts to DT and habitat may potentially occur during construction of this segment of the fiber optic lines. Approximately 0.02 acre of Mojave creosote bush scrub-*Ambrosia dumosa*,

178 square feet (less than 0.01 acre) of desert saltbrush scrub, and 52 square feet (less than 0.01 acre) of Mojave creosote bush habitat would be permanently impacted from construction of 525 new poles.

Approximately 0.32 acre of Mojave creosote bush scrub-*Ambrosia dumosa*, 0.07 acre of desert saltbrush scrub, and 0.02 acre of Mojave creosote bush would be temporarily impacted from construction of 525 new poles, required for this stretch of the route. Areas of Joshua tree woodlands would likely be avoided. Approximately 0.02 acre of developed area would be temporarily impacted from 1,000 feet of new trenching. The remainder of this segment of the Project would result in temporary cable stringing impacts within existing utility transmission line corridors.

6.3 MSP Proposed Compensation Lands

The proposed compensation site would provide several beneficial effects to DT and the species' habitat within the region. These benefits are outlined as follows:

1. The proposed Compensation Lands would consolidate and protect twice the amount of desert scrub vegetation than is being affected by the development aspects of the Proposed Action.
2. The Compensation Lands would be of higher quality than what would be affected through development of the MSP.
3. The Compensation Lands are located within a DT Critical Habitat Unit, thereby fostering the long-term protection of areas essential to the recovery of the species.
4. The Compensation Lands are adjacent to areas with known DT occurrence and have habitat variables consistent with tortoise occupation.

7.0 CUMULATIVE EFFECTS

Cumulative effects from State, local, and private activities (i.e., nonfederal activities) that are reasonably certain to occur within the region are limited to the approximately 80-acre Nursery Products, LLC, Sludge Plant bio-solids composting facility (Sludge Plant), proposed to be located within the Fremont-Kramer DWMA, south of SR 58, west of Helendale Road. Since the Sludge Plant was proposed for construction and operation on private property, the Environmental Impact Report (EIR) prepared in 2006 incorporated mitigation measures outlined in the WEMO

to mitigate project effects on DT. Those measures included the preparation of a Federal Habitat Conservation Plan and State Incidental Take Permit application for effects on DT. Although the San Bernardino County Superior Court issued a judgment on June 23, 2008, requiring San Bernardino County to prepare a revised EIR to address concerns over air quality and water resources, it is anticipated that the biological resources analysis will remain unchanged, and will continue to follow the mitigation requirements outline in the 2006 Sludge Plan EIR. Therefore, the Sludge Plant would not contribute adversely to the cumulative effects on federally listed species.

The Proposed Action would not contribute to cumulative effects on DT or its habitat largely because only a small amount of marginal tortoise habitat and few tortoises are expected to be affected, but also because the conservation measures and Compensation Lands proposed as part of the Project will avoid, minimize, and mitigate any impacts to DT resulting from Project construction and operation. Two power projects within Kern County have filed AFCs with CEC – Pastoria Phase 2 and Beacon Solar Energy Project – however these projects are not located within a 30-mile radius of the Mojave Solar Project (http://www.energy.ca.gov/sitingcases/all_projects.html).

8.0 CONCLUSIONS AND DETERMINATION

Based on the analysis of the Project's potential impacts, this Biological Assessment concludes that the Proposed Action ***may affect, and is likely to adversely affect***, the Mojave population of the desert tortoise. However, the Proposed Action is ***not likely to adversely modify critical habitat*** of the Mojave population of the desert tortoise. These statements are based on the anticipated successful implementation of the various Project design features and conservation and compensation measures described herein, but adverse effects may occur due to the proximity of known desert tortoise located outside of the MSP site and along portions of the SCE components of the Proposed Action.

For the Mojave population of the desert tortoise, the Proposed Action may adversely affect the species, but would avoid and minimize the effects on the desert tortoise through implementation of the following measures:

1. The Proposed Action will include the implementation of the conservation, avoidance, and minimization measures outlined in this Biological Assessment (i.e., measures BIO-1 through BIO-10.

2. For any unanticipated and unavoidable removal of desert scrub vegetation beyond the limits of the identified assumed impacts associated with the SCE fiber optic cable construction, MSLLC and SCE will compensate for the loss of DT habitat by acquisition of additional Compensation Lands, utilizing the compensation ratios identified herein. The location of any additional Compensation Lands will be mutually agreed upon by MSLLC, DOE, and the Service.

9.0 LITERATURE CITED

Abengoa, Inc. (Abengoa)

2009 Application for Certification: Mojave Solar Project. Submitted to the California Energy Commission. Volumes 1 through 3. July.

Andersen, M.C., J.M. Watts, J.E. Freilich, S.R. Yool, G.I. Wakefield, J.F. McCauley, and P.B. Fahnestock

2000 Regression-Tree Modeling of Desert Tortoise Habitat in the Central Mojave Desert. Ecological Applications, 10, 890–200.

Avery, H.W.

1998 Nutritional Ecology of the Desert Tortoise (*Gopherus agassizii*) in Relation to Cattle Grazing in the Mojave Desert. Ph.D. dissertation. University of California, Los Angeles.

Berry, K.H.

1986 Desert tortoise (*Gopherus agassizzii*) research in California, 1976–1985. Herpetologica 42:62–67.

Bureau of Land Management (BLM)

2005 Final Environmental Impact Report and Statement for the West Mojave Plan, A Habitat Conservation Plan and California Desert Conservation Area Plan Amendment Vol. 1. Available at http://www.blm.gov/ca/pdfs/cdd_pdfs/wemo_pdfs/plan/wemo/Vol-1-Chapter1_Bookmarks.pdf. Accessed July 25, 2009.

California Fish and Game Commission (CFGC)

1989 Animals of California Declared to Be Endangered or Threatened. 14 CCR § 670.5, Barclays Official California Code of Regulations Title 14. Natural Resources, Division 1, Fish and Game Commission-Department of Fish and Game, Subdivision 3. General Regulations, Chapter 3, Miscellaneous.

Desert Tortoise Council (DTC)

1999 Guidelines for Handling Desert Tortoises During Construction Projects. Edward L. LaRue, Jr., editor. San Bernardino, California. 1994 Guidelines revised in 1999.

Esque, T.C.

1994 Diet and Diet Selection of the Desert Tortoise (*Gopherus agassizii*) in the Northeastern Mojave Desert. Master's thesis. Colorado State University, Fort Collins.

Heaton, J.S., A. Karl, K. Nussear, R. Inman, and C. Everly

2004 Estimation of numbers of desert tortoises in the additional training lands at Fort Irwin and the Western Mojave Recovery Unit. Unpublished calculations.

Jennings, W.B.

1997 Habitat Use and Food Preferences of the Desert Tortoise, *Gopherus agassizii*, in the Western Mojave and Impacts of Off-Road Vehicles. Pages 42–45 in J. Van Abbema (ed.), Proceedings of the International Conference on Conservation, Restoration, and Management of Tortoises and Turtles. New York Turtle and Tortoise Society, New York.

Newton, G.A. and V.P. Claassen

2003 *Rehabilitation of Disturbed Lands in California: A Manual for Decision Making*, California Geological Survey Special Publication 123, 228 p.

Nussear, K.E., T.C. Esque, R.D. Inman, Leila Gass, K.A. Thomas, C.S.A. Wallace, J.B. Blainey, D.M. Miller, and R.H. Webb

2009 Modeling Habitat of the Desert Tortoise (*Gopherus agassizii*) in the Mojave and Parts of the Sonoran Deserts of California, Nevada, Utah, and Arizona: U.S. Geological Survey Open-File Report 2009-1102, 18 p.

Stebbins, R.C.

1985 *A Field Guide to Western Reptiles and Amphibians*. Second edition. Houghton Mifflin Co., Boston. 336 pp.

Tracy, C.R., R. Averill-Murray, W.I. Boarman, D. Delehanty, J. Heaton, E. McCoy, D. Morafka, K. Nussear, B. Hagerty, and P. Medica

2004 Desert Tortoise Recovery Plan Assessment. Prepared for the U.S. Fish and Wildlife Service. Reno, Nevada.

U.S. Fish and Wildlife Service (USFWS)

1990. Final rule: determination of the threatened status for the Mojave population of the desert tortoise. FR 55(63):12178-12191.

1994a Endangered and Threatened Wildlife and Plants; Determination of Critical Habitat for the Mojave Population of the Desert Tortoise. Federal Register 59(26):5820–5866.

1994b The Desert Tortoise (Mojave Population) Recovery Plan. U.S. Fish and Wildlife Service, Region 1 – Lead Region, Portland, Oregon. 73 pp. + appendices.

2006 Biological Opinion for the California Desert Conservation Area Plan [West Mojave Plan] (6840(P) CA-063.50) (1 -8-03-F-58). Ventura Fish and Wildlife Office. Ventura, California. January 9, 2006.

2008 Draft Revised Recovery Plan for the Mojave Population of the Desert Tortoise. Available at http://www.fws.gov/nevada/desert%5Ftortoise/documents/recovery_plan/DraftRevRP_Mojave_Desert_Tortoise.pdf.

10.0 LIST OF CONTACTS/CONTRIBUTORS/PREPARERS

Lyndon Quon
AECOM

11.0 MAPS AND FIGURES

The following Figures referenced in this supplemental Biological Assessment are attached:

Figure 1: Regional Map
Figure 2a: Vicinity Map: Mojave Solar Project, Lockhart Substation and Interconnection
Figure 2b: Vicinity Map: Lockhart Substation to Tortilla Substation Fiber Optic Line
Figure 2c: Vicinity Map: Lockhart Substation to Kramer Substation Fiber Optic Line
Figure 3: Plant Site Layout
Figure 4: Desert Tortoise Sign
Figure 5: Desert Tortoise Observations
Figure 6: Vegetation Communities, Compensation Lands and Project Vicinity
Figure 7: Compensation Lands, Vegetation Communities, and Species Data

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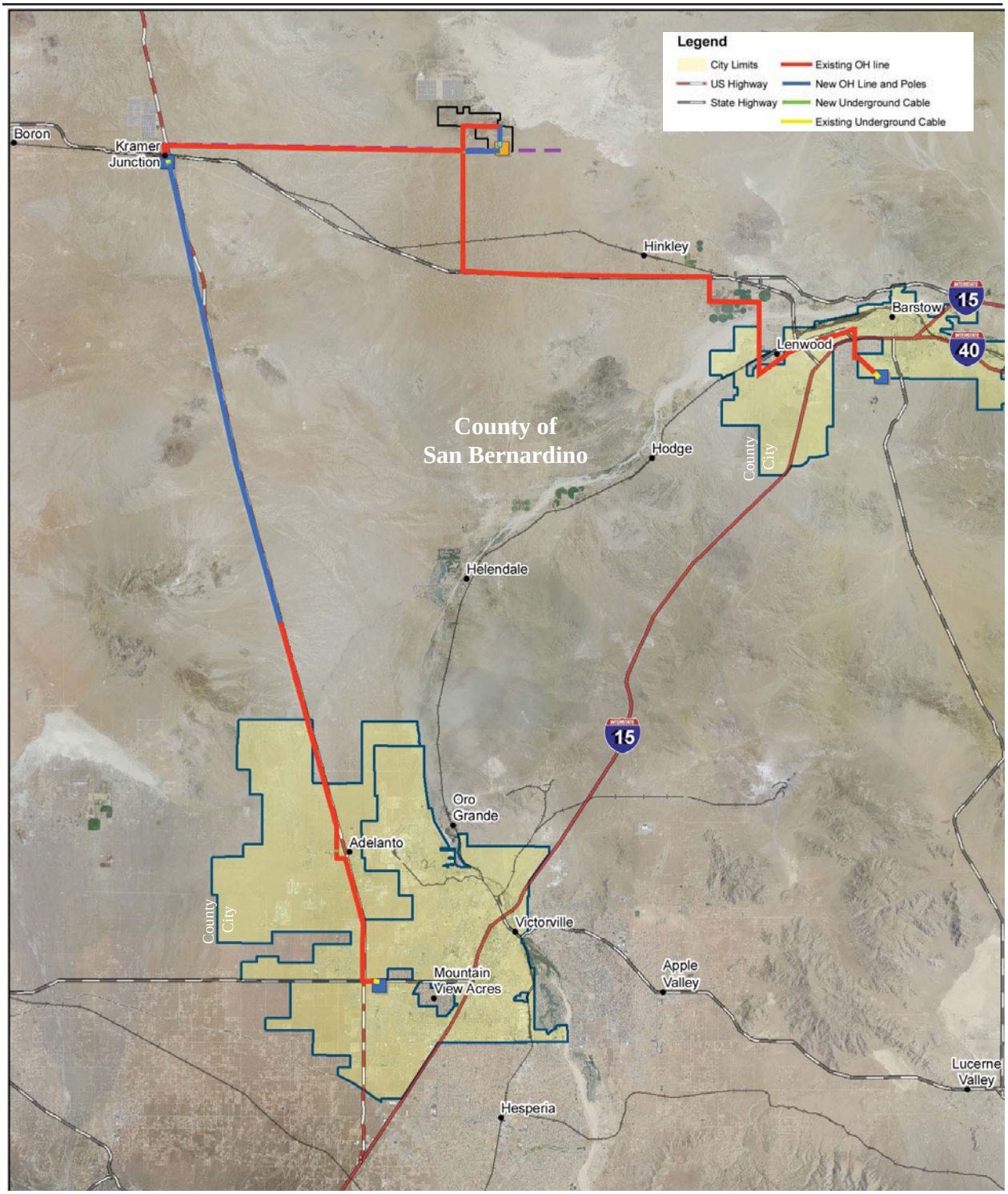

Source: AECOM

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Figure 1
Regional Map

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Mojave Solar Project - Biological Assessment

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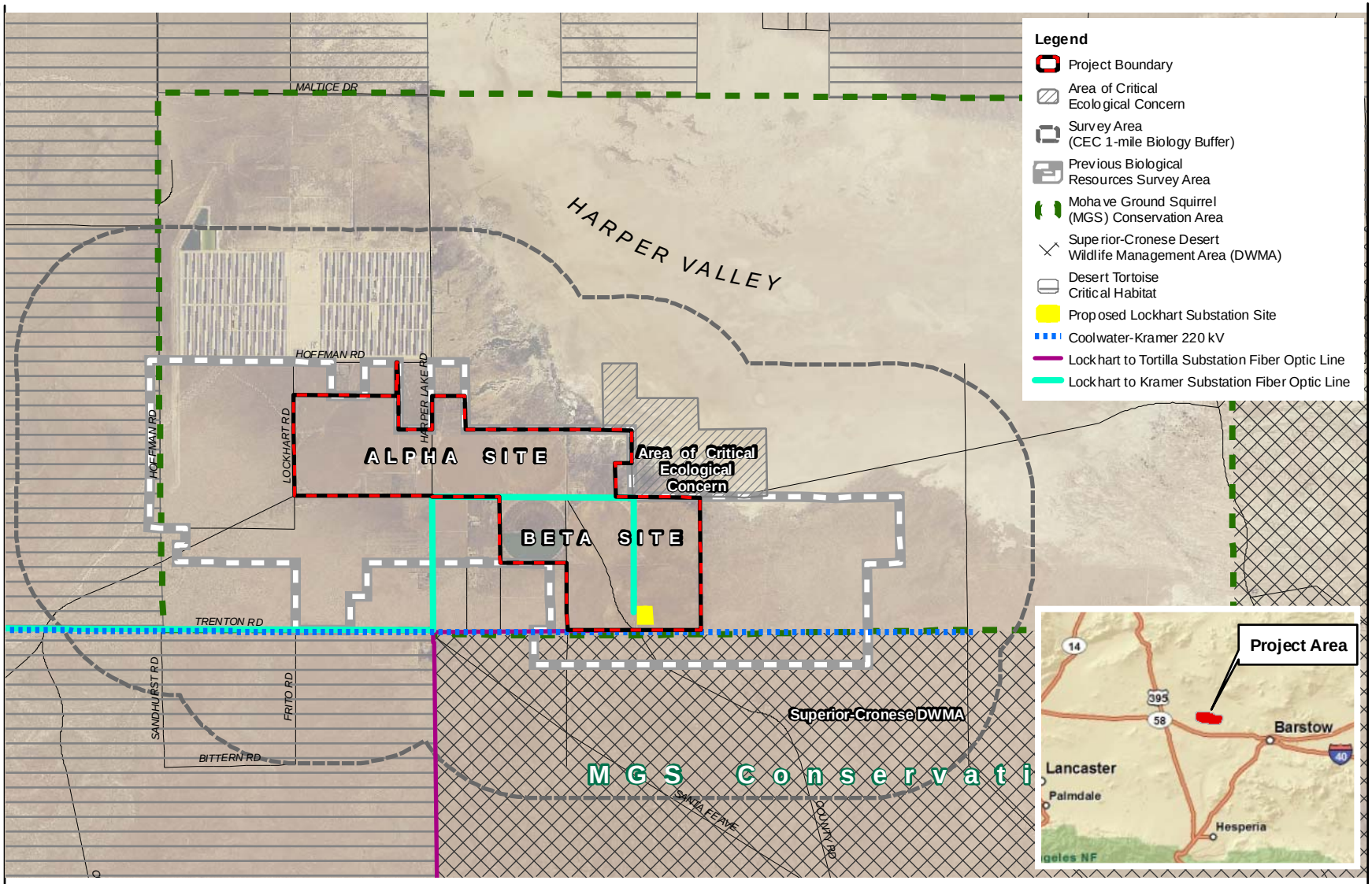

Source: NAPI 205; Mojave Solar, LLC 2010; AECOM 2010

6,000 0 6,000 Feet

Scale: 1 = 72,000; 1 inch = 6,000 feet

Figure 2a
Vicinity Map: Mojave Solar Project Site, Lockhart Substation and Interconnection

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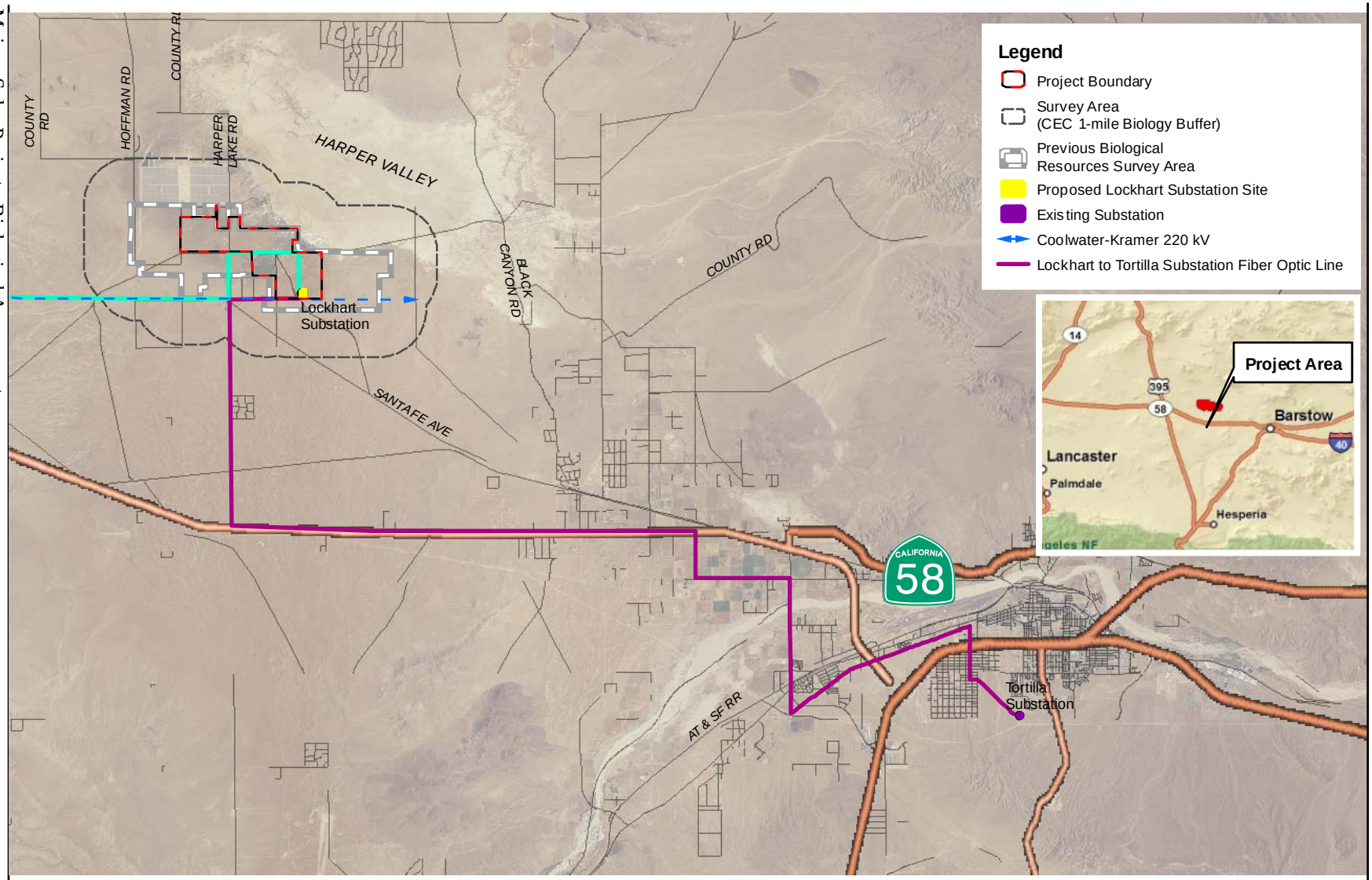

Source: NAIP 205; Mojave Solar, LLC 2010; AECOM 2010

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Scale: 1 = 3,248,841; 1 inch = 270,737 feet

Figure 2b
Vicinity Map: Lockhart to Tortilla Substation Fiber Optic Line

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Mojave Solar Project - Biological Assessment

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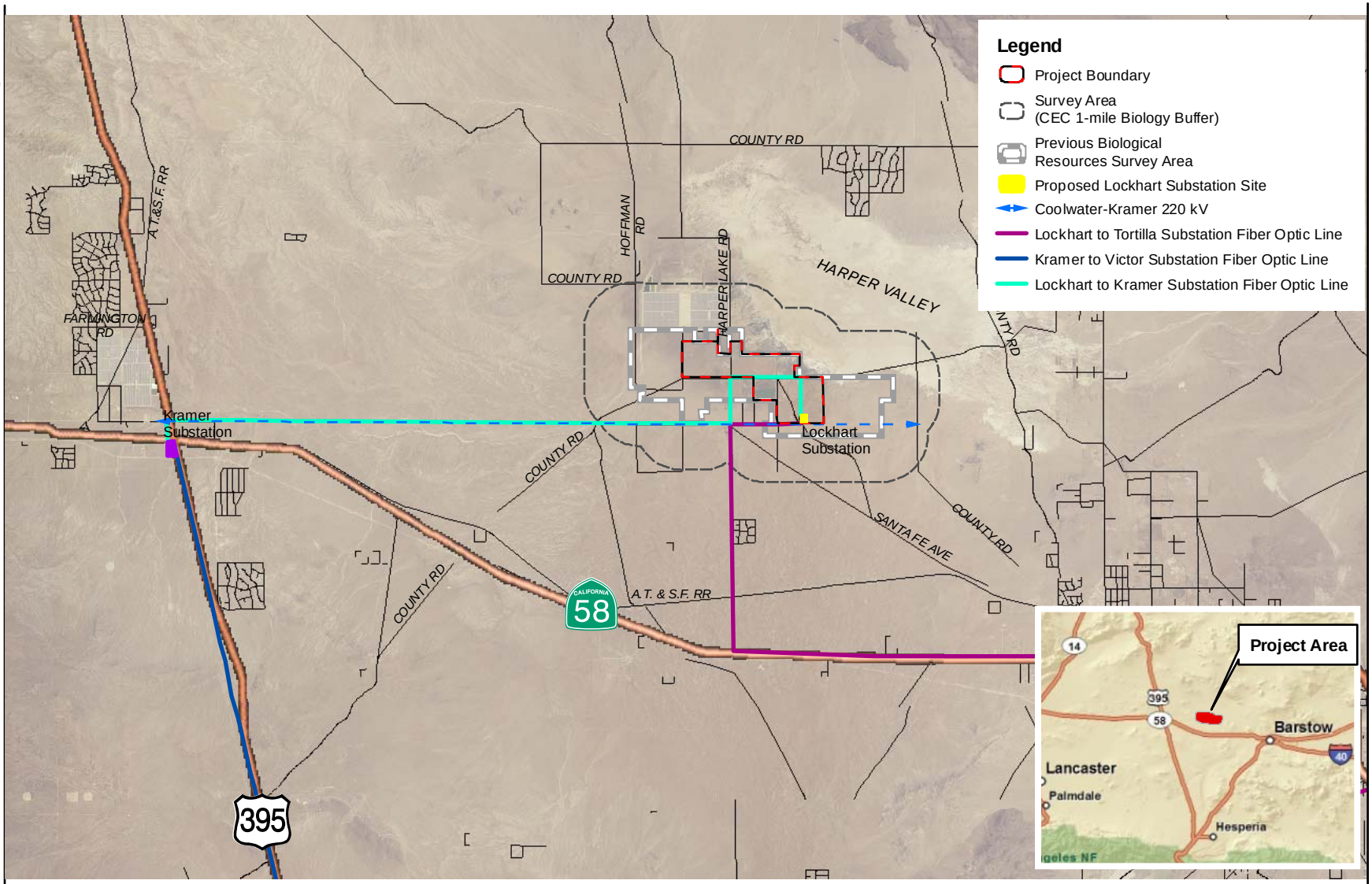

Source: NAIP 205; Mojave Solar, LLC 2010; AECOM 2010

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Scale: 1 = 206,394; 1 inch = 17,200 feet

Figure 2c

Vicinity Map: Lockhart to Kramer Substation Fiber Optic Line

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Mojave Solar Project - Biological Assessment

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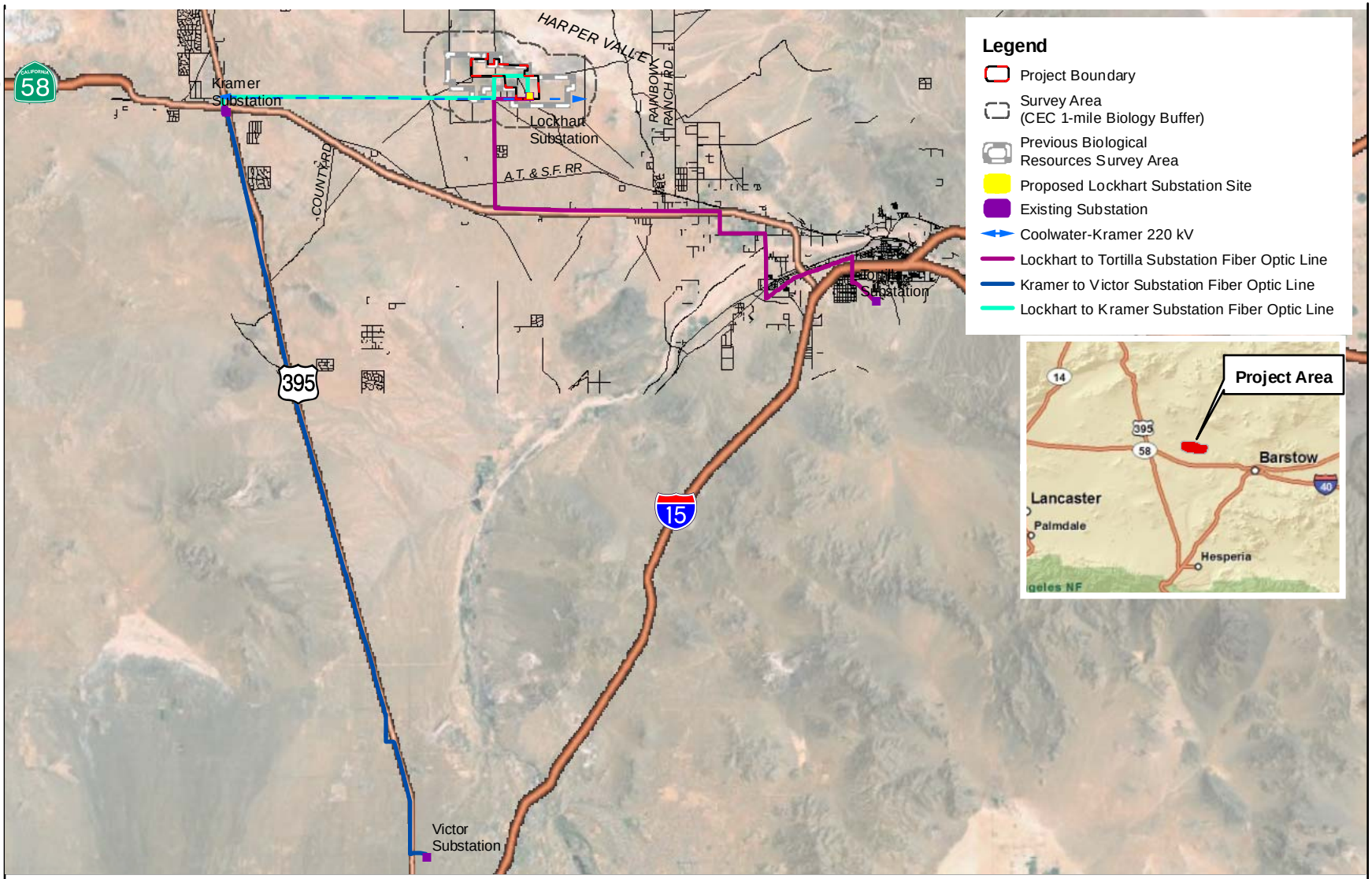

Source: NAIP 2005; Mojave Solar, LLC 2010; AECOM 2010

6.8 0 6.8 Miles

Scale: 1 = 428,715.3; 1 inch = 6.8 mile(s)

Figure 2d

Vicinity Map: Kramer to Victor Substation Fiber Optic Line

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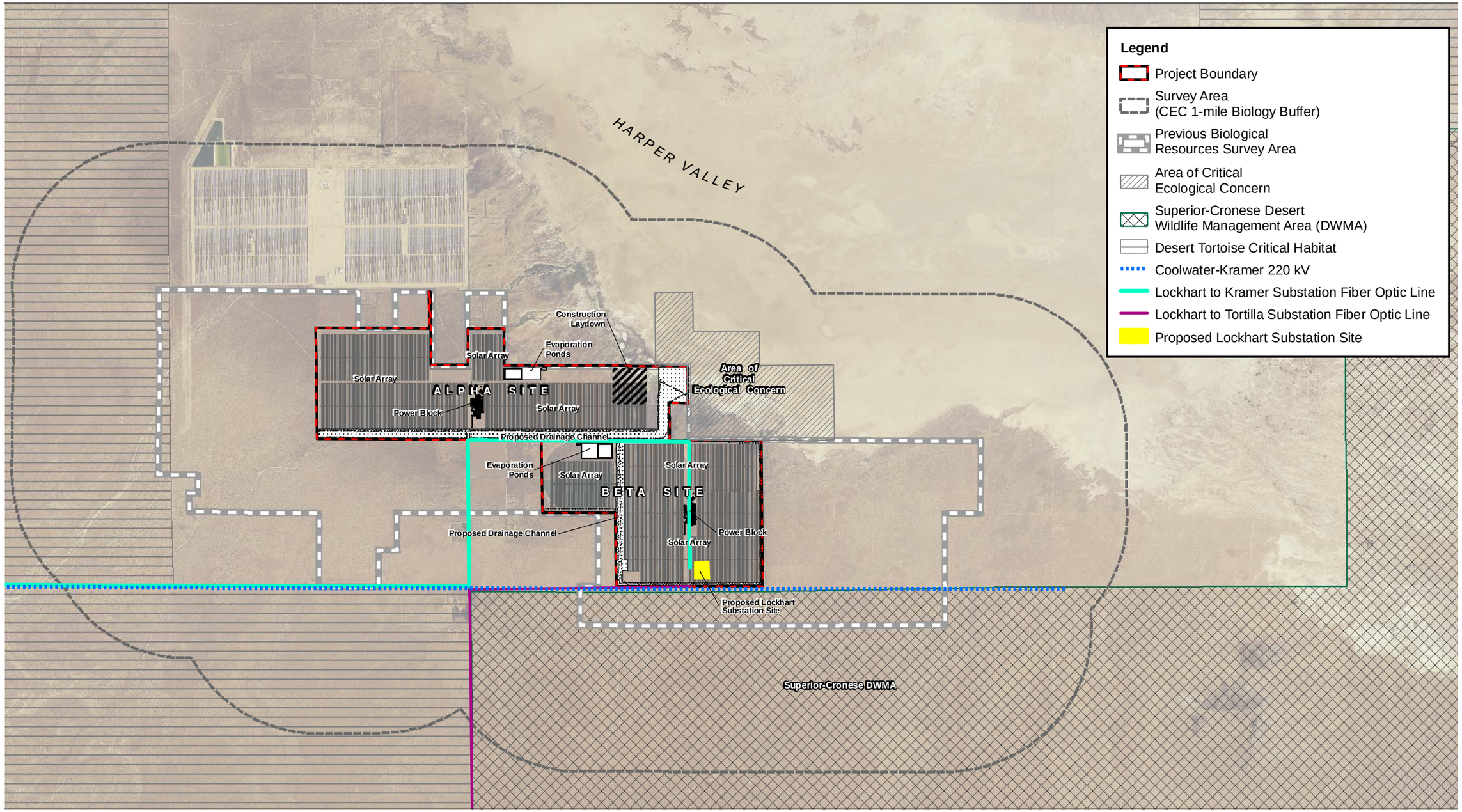

Source: NAIP 2005; USFWS 2006; BLM 2009; Mojave Solar, LLC 2009

3,500 1,750 0 3,500 Feet

Scale: 1 = 42,000; 1 inch = 3,500 feet

Figure 3
Plant Site Layout

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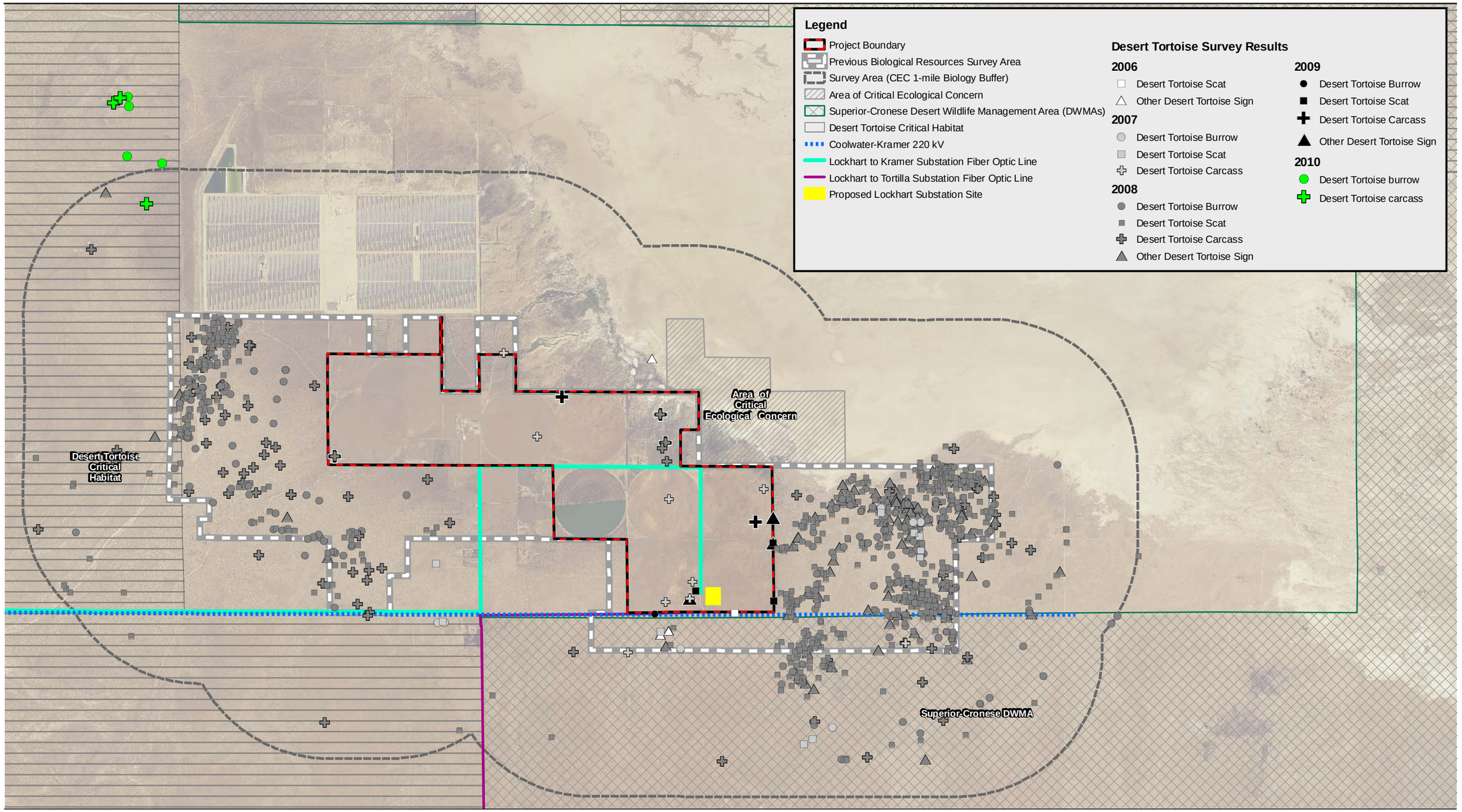

Source: NAIP 2005; USFWS 2006; Mojave Solar, LLC 2009

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Scale: 1 = 42,000; 1 inch = 3,500 feet

Figure 4
Desert Tortoise Sign

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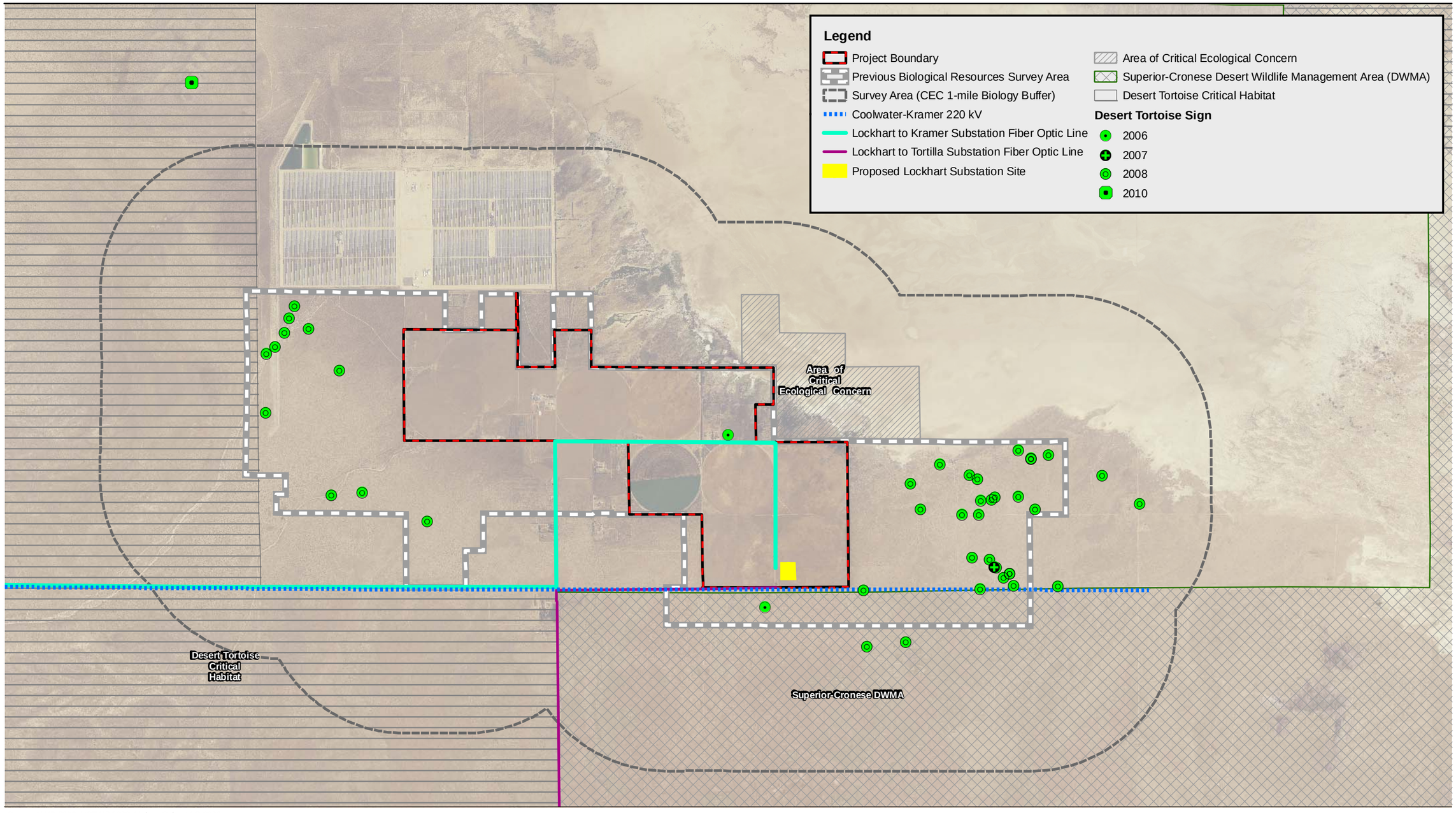

Source: NAIP 2005; USFWS 2006; Mojave Solar, LLC 2009

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Scale: 1 = 42,000; 1 inch = 3,500 feet

Figure 5
Desert Tortoise Observations

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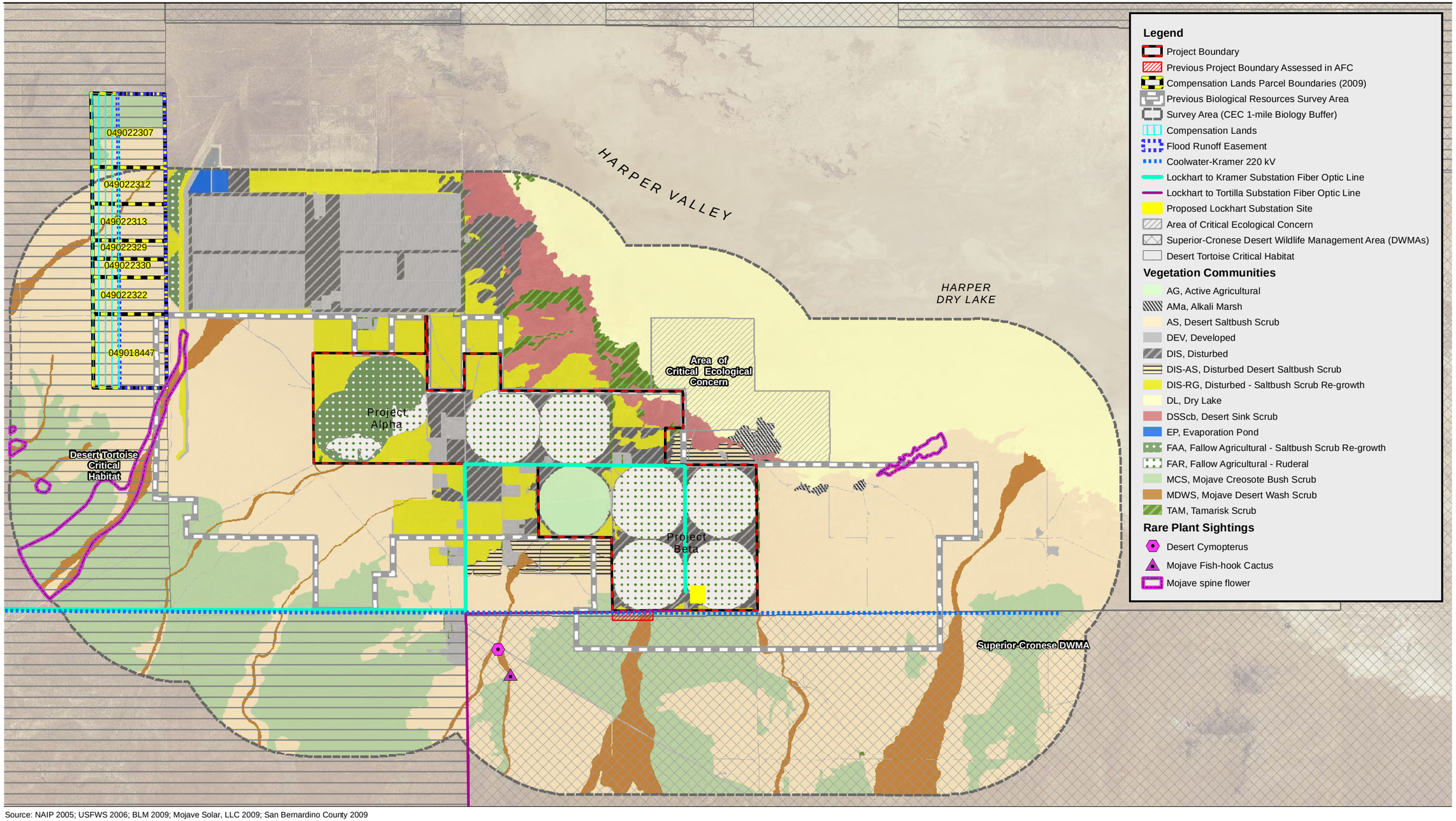

Source: NAIP 2005; USFWS 2006; BLM 2009; Mojave Solar, LLC 2009; San Bernardino County 2009

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Scale: 1 = 42,000; 1 inch = 3,500 feet

Figure 6a
Vegetation Communities, Compensation Lands and Project Vicinity

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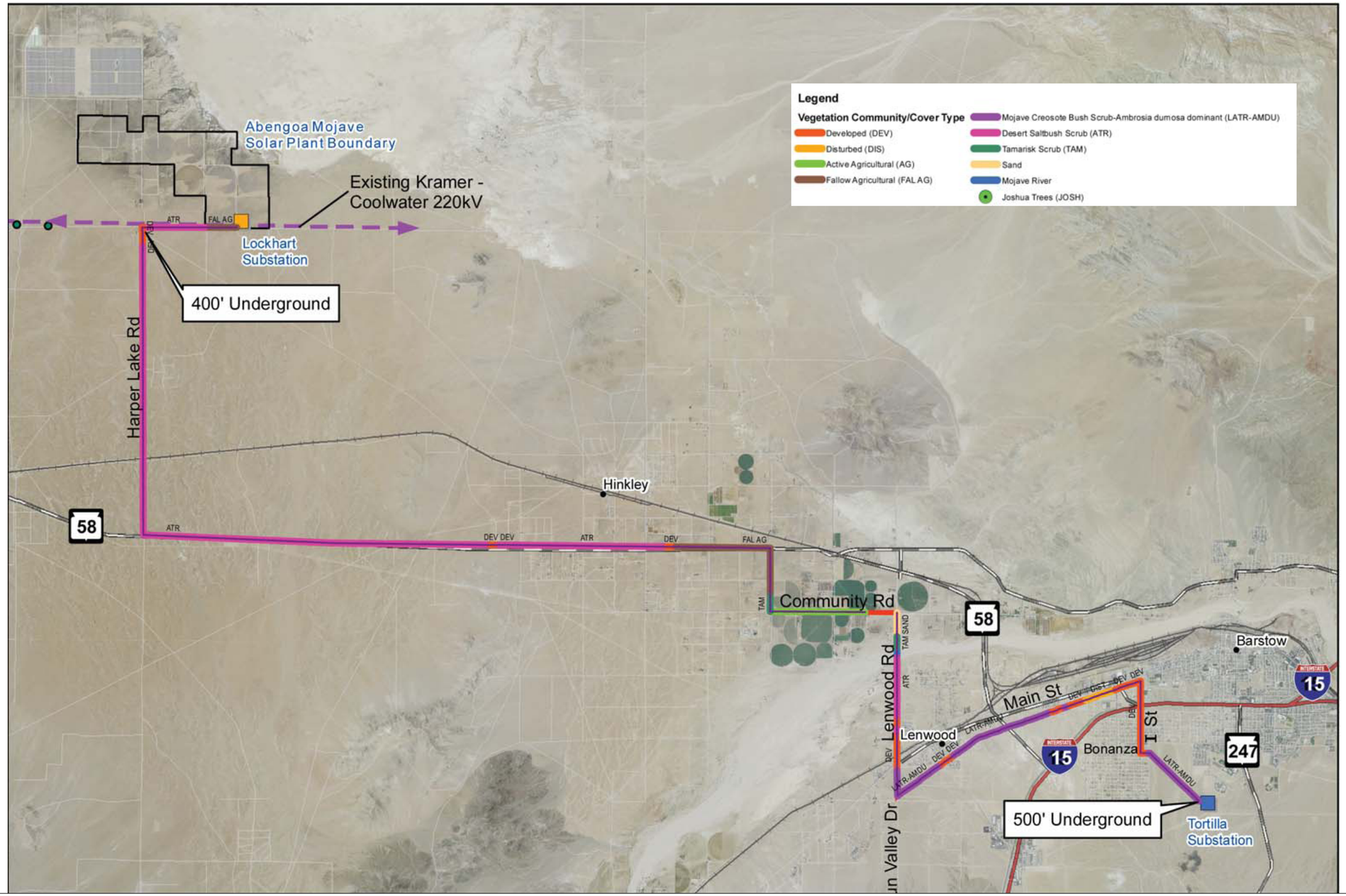

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0 2 4 Miles

Figure 6b
Lockhart to Tortilla - Exisitng Vegetation Map

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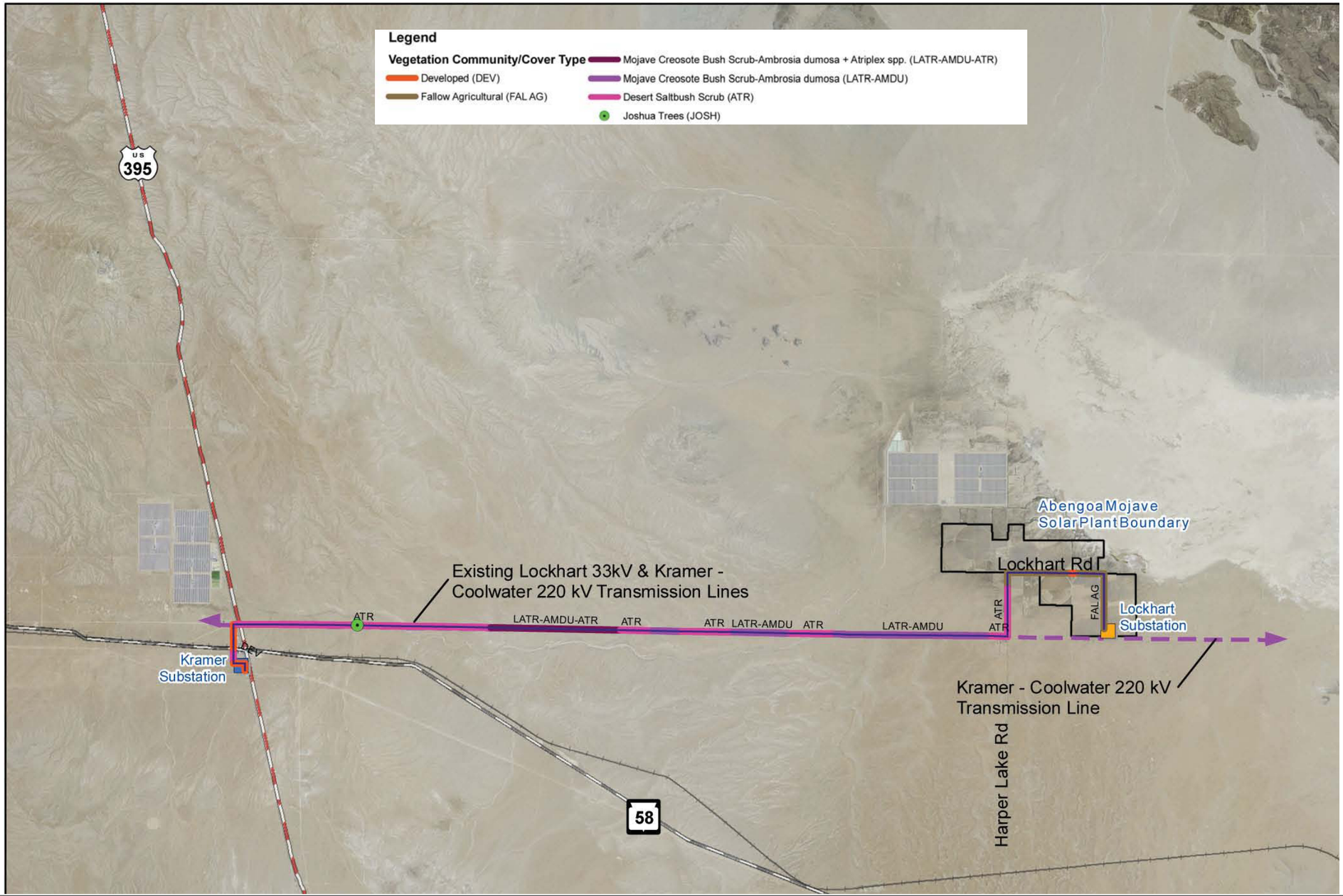

Source: AECOM

0 2 4 Miles

Figure 6c
Lockhart to Kramer - Exisitng Vegetation Map

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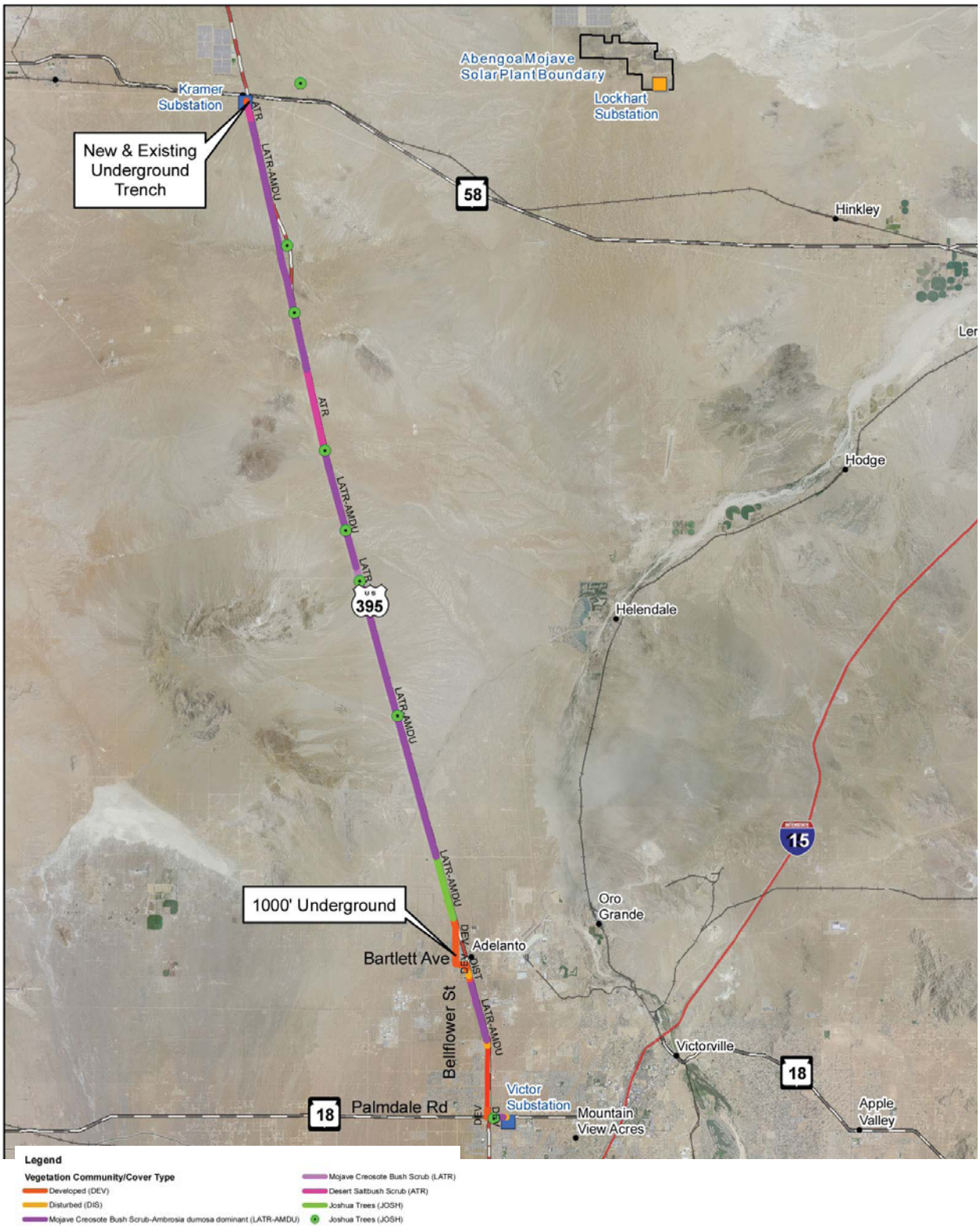

Source: AECOM

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Figure 6d
Kramer to Victor - Existing Vegetation Map

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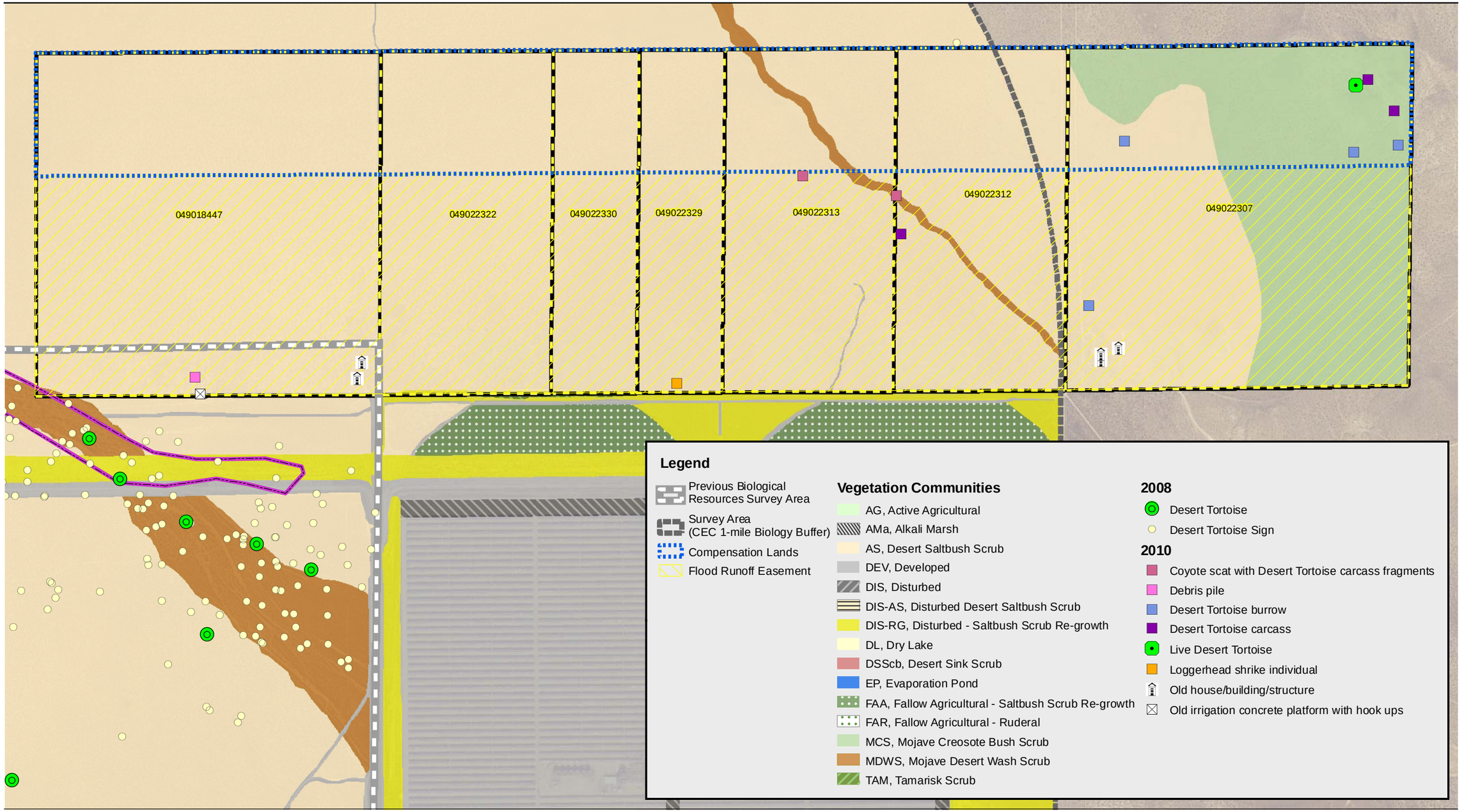

Source: NAIP 2005; BLM 2009; Mojave Solar, LLC 2009; San Bernardino County 2009

750 375 0 750 Feet

Scale: 1 = 9,000; 1 inch = 750 feet

Figure 7
Compensation Lands, Vegetation Communities and Species Data

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