CHAPTER 3 – AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This chapter describes the affected environment (environmental setting) of the Project Study Area. It provides information on the physical, biological, cultural, socioeconomic, and other resources that have the potential to affect or be affected by activities related to implementing the Proposed Action or alternatives that are discussed in detail in Chapter 2. These resources include those that occur within the proposed Project area, or adjacent to or otherwise associated with the area. More detailed information for some resources (noise, air quality, biological resources, hydrology, geology, traffic, and hazardous waste) is provided in the technical reports or supporting information provided as technical appendices to this EIS. For the purpose of this document, the environmental setting, or "baseline," used for the impact analysis reflects conditions at the time of issuance of the Notice of Intent (NOI) in January 2010.

The following resources are evaluated in this EIS:

- Air resources;
- Vegetation;
- Wildlife;
- Climate change;
- Cultural resources;
- Paleontological resources;
- Geology and soil resources;
- Lands and realty;
- Noise;
- Public health and safety/hazardous materials (includes wildland fire);
- Recreation;
- Socioeconomics and environmental justice (includes public services);
- Special designations;
- Transportation and public access;
- Visual resources; and
- Water resources.

The following resources would not be affected by the Proposed Action or alternatives and are not further evaluated in this EIS:

- Livestock grazing—There is no known livestock grazing within or adjacent to the Project Study Area;

- Wild horse and burros—There are no known wild horse or burro populations within or surrounding the Project Study Area; and
- Mineral resources—There are no known locatable, leasable, or salable mineral resource deposits or mineral resource rights within or adjacent to the Project Study Area.

For each resource, a discussion of applicable plans, policies, and regulations is provided. All applicable federal, state, and local laws, regulations, and policies are summarized and their applicability to the Project explained. It is assumed in the analysis that the Applicant (in this case, Sunlight) and Southern California Edison (SCE) will fully comply with all regulations applicable to their respective Project components, will prepare any required plans, and will obtain any necessary permits or waivers. For the Red Bluff Substation, in accordance with California Public Utilities Commission (CPUC) General Order 131D, public utility providers such as SCE are not subject to local jurisdiction. CPUC General Order 131D specifically requires public utility providers to consult with local agencies on land use issues, but ultimately the CPUC has the authority to permit public utility projects *on private lands*.

The environmental setting (existing conditions) of the Project area is described using information from literature reviews, fieldwork, and input from appropriate federal, state, and local agencies. Where appropriate, the resource sections in this chapter define and describe a resource-specific region of influence (ROI), which serves as the baseline for the environmental impact analysis. Defining these conditions (such as existing air quality, biological and cultural resources, water resources, and recreational opportunities) allows for characterization and anticipation of the proposed Project's impacts and forms the basis for the environmental analysis. Sources for the literature reviews included published technical reports, internet resources, data from government sources, aerial photographs, and information provided by the Applicant. Where existing information regarding the Project area was insufficient or outdated, or where surveys or studies were specifically required by jurisdictional agencies, surveys and studies were conducted to determine the existing environmental conditions. This work included gathering information for biological and cultural resources, air quality, geotechnical, visual resources, and jurisdictional delineation surveys.

As discussed in Chapter 1, the Project is subject to environmental review under the National Environmental Policy Act (NEPA). In addition, since the CPUC has permitting authority over the Red Bluff Substation, CPUC may use this EIS for its environmental review under the California Environmental Quality Act (CEQA). As a result, this EIS was written to comply with NEPA and to satisfy CEQA requirements for those project components that require entitlements from state and local agencies, in accordance with CEQA Guidelines Section 15221. Due to the similarity in information requirements for both NEPA and CEQA, the existing conditions setting described in this chapter serves both purposes.

3.2 AIR RESOURCES

The term "pollutant emissions" refers to the amount (usually stated as a weight) of one or more specific compounds introduced into the atmosphere by a source or group of sources. In practice, most pollutant emissions data are presented as "emission rates": the quantity of pollutants emitted during a specified increment of time or during a specified increment of emission source activity. Typical measurement units for emission rates on a time basis include pounds per hour, pounds per day, or tons per year. Typical measurement units for emission rates on a source activity basis include pounds per thousand gallons of fuel burned, pounds per ton of material processed, and grams per vehicle mile of travel.

The term "ambient air quality" refers to the atmospheric concentration of a specific compound (quantity of pollutants in a specified volume of air) actually experienced at a particular geographic location that may be some distance from the source of the relevant pollutant emissions. The ambient air quality levels actually measured at a particular location are determined by the interactions among three groups of factors:

- Emissions: the types, amounts, and locations of pollutants emitted into the atmosphere;
- Meteorology: the physical processes affecting the distribution, dilution, and removal of these pollutants; and
- Chemistry: any chemical reactions that transform pollutant emissions into other chemical substances.

In a regulatory context, "ambient air" refers to outdoor locations to which the general public has access. Ambient air quality data are generally reported as a mass per unit volume (e.g., micrograms per cubic meter of air) or as a volume fraction (e.g., parts per million by volume).

Air pollutants are often characterized as being "primary" or "secondary" pollutants. Primary pollutants are those emitted directly into the atmosphere (such as carbon monoxide, sulfur dioxide, lead particulates, and hydrogen sulfide). Secondary pollutants are those (such as ozone, nitrogen dioxide, and sulfate particles) formed through chemical reactions in the atmosphere; these chemical reactions usually involve primary pollutants, normal constituents of the atmosphere, and other secondary pollutants. Those compounds which react to form secondary pollutants are referred to as reactive pollutants, pollutant precursors, or precursor emission products. Some air pollutants (such as many organic gases and suspended particulate matter) are a combination of primary and secondary pollutants.

3.2.1 Applicable Plans, Policies, and Regulations

Air Quality Standards

Federal and state air quality management programs have evolved using two distinct management approaches:

- The State Implementation Plan (SIP) process of setting ambient air quality standards for acceptable exposure to air pollutants, conducting monitoring programs to identify locations experiencing air quality problems, and then developing programs and regulations designed to reduce or eliminate those problems; and

- The Hazardous Air Pollutant (HAP) regulatory process identifying specific chemical substances that are potentially hazardous to human health, and then setting emission standards to regulate the amount of those substances that can be released by individual commercial or industrial facilities or by specific types of equipment.

Criteria Air Pollutants

Air quality programs based on ambient air quality standards typically address air pollutants that are produced in large quantities by widespread types of emission sources and which are of public health concern because of their toxic properties. The U.S. Environmental Protection Agency (EPA) has established ambient air quality standards for several different pollutants, which often are referred to as criteria pollutants (ozone, nitrogen dioxide, carbon monoxide, sulfur dioxide, suspended particulate matter, and lead). Standards for suspended particulate matter have been set for two size fractions: inhalable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$). Federal ambient air quality standards are based primarily on evidence of acute and chronic health effects. Federal ambient air quality standards apply to outdoor locations to which the general public has access.

Some states have adopted ambient air quality standards that are more stringent than the comparable federal standards or to address pollutants that are not covered by federal ambient air quality standards. Most state ambient air quality standards are based primarily on health effects data, but can reflect other considerations such as protection of crops, protection of materials, or avoidance of nuisance conditions (such as objectionable odors). Table 3.2-1 summarizes ambient air quality standards adopted by EPA and the California Air Resources Board (CARB).

Table 3.2-1
State and National Ambient Air Quality Standards Applicable In California

Pollutant	Averaging Time	Standards in Parts Per Million by Volume (ppm) California	Standards in Parts Per Million by Volume (ppm) National	Standards in Micrograms Per Cubic Meter ($\mu g/m^3$) California	Standards in Micrograms Per Cubic Meter ($\mu g/m^3$) National	Violation Criteria California	Violation Criteria National
Ozone	1 Hour	0.09	Standard rescinded	180	Standard rescinded	If exceeded	Not applicable
Ozone	8 Hours	0.070	0.075	137	147	If exceeded	If exceeded by the mean of annual 4th highest daily values for a 3-year period
Carbon Monoxide	1 Hour	20	35	23,000	40,000	If exceeded	If exceeded on more than 1 day per year
Carbon Monoxide	8 Hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year

Table 3.2-1 (continued)
State and National Ambient Air Quality Standards Applicable In California

Pollutant	Averaging Time	Standards in Parts Per Million by Volume (ppm) California	Standards in Parts Per Million by Volume (ppm) National	Standards in Micrograms Per Cubic Meter (µg/m³) California	Standards in Micrograms Per Cubic Meter (µg/m³) National	Violation Criteria California	Violation Criteria National
Carbon Monoxide	8 Hours (Lake Tahoe Basin only)	6.0	9	7,000	10,000	If equaled or exceeded	If exceeded on more than 1 day per year
Nitrogen Dioxide	Annual Average	0.030	0.053	*57*	100	If exceeded	If exceeded
Nitrogen Dioxide	1 Hour	0.18	0.100	*339*	188	If exceeded	If exceeded by the mean of annual 98th percentile values over 3 years
Sulfur Dioxide	Annual Average	No standard	0.03*0*	No standard	80	Not applicable	If exceeded
Sulfur Dioxide	24 Hours	0.04	0.14	105	365	If exceeded	If exceeded on more than 1 day per year
Sulfur Dioxide	3 Hours	No standard	0.5	No standard	1,300	Not applicable	If exceeded on more than 1 day per year
Sulfur Dioxide	1 Hour	0.25	No standard	655	Not applicable	If exceeded	Not applicable
Inhalable Particulate Matter (PM_{10})	Annual Arithmetic Mean	Not applicable	Not applicable	20	Standard rescinded	If exceeded	Not applicable
Inhalable Particulate Matter (PM_{10})	24 Hours	Not applicable	Not applicable	50	150	If exceeded	For 1997 non-attainment areas, if exceeded on more than 1 day per year. For other areas, if exceeded by the mean of annual 99th percentile values over 3 years

Table 3.2-1 (continued)
State and National Ambient Air Quality Standards Applicable In California

Pollutant	Averaging Time	Standards in Parts Per Million by Volume (ppm) California	Standards in Parts Per Million by Volume (ppm) National	Standards in Micrograms Per Cubic Meter (µg/m³) California	Standards in Micrograms Per Cubic Meter (µg/m³) National	Violation Criteria California	Violation Criteria National
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	Not applicable	Not applicable	12	15.0	If exceeded	If exceeded as a 3-year spatial average of data from designated stations
Fine Particulate Matter ($PM_{2.5}$)	24 Hours	Not applicable	Not applicable	No standard	35	Not applicable	If exceeded by the mean of annual 98th percentile values over 3 years
Lead Particles (TSP sampler)	Calendar Quarter	Not applicable	Not applicable	No standard	1.5	Not applicable	If exceeded
Lead Particles (TSP sampler)	Rolling 3-Month Average	Not applicable	Not applicable	No standard	0.15	Not applicable	If exceeded during a 3-year period
Lead Particles (TSP sampler)	30 Days	Not applicable	Not applicable	1.5	No standard	If exceeded	Not applicable
Sulfate Particles (TSP sampler)	24 Hours	Not applicable	Not applicable	25	No standard	If equaled or exceeded	Not applicable
Hydrogen Sulfide	1 Hour	0.03	No standard	42	No standard	If exceeded	Not applicable
Vinyl Chloride	24 Hours	0.01	No standard	26	No standard	If equaled or exceeded	Not applicable

Notes:

All standards except the national PM_{10} and $PM_{2.5}$ standards are based on measurements corrected to 25 degrees C and 1 atmosphere pressure.

The national PM_{10} and $PM_{2.5}$ standards are based on direct flow volume data without correction to standard temperature and pressure.

Decimal places shown for standard reflect the rounding or truncating conventions used for evaluating compliance.

The "10" in PM_{10} and the "2.5" in $PM_{2.5}$ are not particle size limits; these numbers identify the particle size class (aerodynamic diameter in microns) collected with 50% mass efficiency by certified sampling equipment. The maximum particle size collected by PM_{10} samplers is about 50 microns. The maximum particle size collected by $PM_{2.5}$ samplers is about 6 microns.

Data Sources:

40 CFR Parts 50, 53, and 58; CARB (2010a); EPA (2010b).

Hazardous Air Pollutants

Air quality programs based on regulation of other hazardous substances typically address chemicals used or produced by limited categories of industrial facilities. Programs regulating hazardous air pollutants focus on: substances that alter or damage the genes and chromosomes in cells (mutagens); substances that affect cells in ways that can lead to uncontrolled cancerous cell growth (carcinogens); substances that can cause birth defects or other developmental abnormalities (teratogens); substances with serious acute toxicity effects; and substances that undergo radioactive decay processes, resulting in the release of ionizing radiation. Federal air quality management programs for hazardous air pollutants focus on setting emission limits for particular industrial processes rather than setting ambient exposure standards. Some states have established ambient exposure guidelines for various hazardous air pollutants, and use those guidelines to as part of the permit review process for industrial emission sources.

Air Quality Planning Programs

Since 1970, the federal Clean Air Act (CAA) has required each state to identify areas that have ambient air quality in violation of federal standards. States are required to develop, adopt, and implement a SIP to achieve, maintain, and enforce federal ambient air quality standards in these nonattainment areas. The SIP process includes specific deadlines for achieving the federal ambient air quality standard once a nonattainment designation has been made. Deadlines for achieving the federal air quality standards vary according to air pollutant and the severity of existing air quality problems. The SIP must be submitted to and approved by EPA. SIP elements are developed on a pollutant-by-pollutant basis whenever one or more air quality standards are being violated. Development of SIP documents is formally the responsibility of the relevant state air quality management agency. In many states, local/regional air quality management agencies and local/regional transportation planning agencies assume the primary responsibility for SIP document preparation, with state air quality management agency oversight and approval.

The status of areas with respect to each federal ambient air quality standard is typically categorized as nonattainment (in violation of a national standard), attainment (in compliance with a national standard), unclassifiable, or attainment/unclassified. For most air pollutants, initial federal status designations are made using only two categories: nonattainment or unclassifiable/attainment. The unclassified designation includes attainment areas that comply with federal standards as well as areas for which monitoring data are lacking. Unclassified areas are treated as attainment areas for most regulatory purposes.

Simple attainment designations generally are used only for areas that transition from a nonattainment status to an attainment status. Areas that have been reclassified from nonattainment to attainment of federal air quality standards are automatically considered “maintenance areas”, although this designation is not always noted in status listings.

The California Clean Air Act of 1988 created a state air quality planning program similar to the federal SIP process for areas that violate state ambient air quality standards. CARB designates areas as attainment, nonattainment, or unclassified with respect to each of the state ambient air quality standards. Local air quality management agencies, in consultation with the relevant council of governments, are responsible for preparing and updating state air quality management plans for pollutants other than suspended particulate matter. CARB is responsible for air quality planning

efforts addressing the state ambient air quality standards for suspended particulate matter (PM_{10} and $PM_{2.5}$). The state air quality planning process differs from the federal SIP process in one respect: while there are requirements to show on-going improvement in air quality, there are no specific deadlines for achieving state air quality standards.

The geographic basis for attainment status designations varies from state to state, and often varies according to the pollutant being considered. The geographic area used for designations can be based on city or county boundaries; metropolitan statistical area boundaries; areas defined by township and range; areas defined by highways or topographic features; or areas defined by a combination of these types of boundaries. The largest geographic units used for attainment status designations are called air quality control regions (EPA terminology) or air basins (CARB terminology). Air quality control regions and air basins are typically defined by a combination of political boundaries (often county boundaries) and topographic features that influence meteorological conditions and pollutant transport.

Riverside County has adopted an air quality element in the county general plan. The air quality element includes policies supporting regional cooperation with other jurisdictions to improve air quality; requiring compliance with federal, sate, and regional air quality regulations; encouraging programs to reduce vehicle travel; encouraging energy conservation in urban land uses; and encouraging development patterns that improve the county's jobs/housing balance.

Visibility

The federal CAA requires a planning program with the goal that all areas of the country achieve the federal ambient air quality standards within various specified time frames. For attainment areas that already meet the federal ambient air quality standards, the federal Prevention of Significant Deterioration (PSD) permit program established a three-tier classification defining the extent to which baseline air quality conditions can be degraded. Class I areas have the smallest allowable air quality deterioration limits. Class II areas allow greater deterioration of air quality but must maintain air quality conditions better than the federal air quality standards. Class III areas allow deterioration of air quality to the level of the federal ambient air quality standards. There are currently 163 Class I areas designated in the United States, with 29 Class I areas in California. Two of the 163 Class I areas are exempt from visibility impairment analyses under the PSD program because visibility is not considered an important air quality value in those areas. All areas outside Class I areas are currently designated as Class II areas. No Class III areas have been designated. The Class I area closest to the Project vicinity is the Joshua Tree Wilderness Area within Joshua Tree National Park. Visibility is considered an important air quality value to be protected within Joshua Tree National Park. There are no other Class I areas within 62 miles (100 kilometers) of the solar farm site. The San Jacinto Wilderness west of Palm Springs is about 69 (111 kilometers) miles from the solar farm site, and the San Gorgonio Wilderness in San Bernardino County is about 77 (124 kilometers) miles northwest of the solar farm site.

The federal CAA requires EPA to protect visibility conditions within the Class I areas that have been established under the PSD program. The CAA also requires development of programs to remedy existing visibility impairment in Class I areas if that visibility impairment results from man-made air pollution. EPA has identified two general types of visibility impairment at Class I areas:

- Impairment due to smoke, dust, colored gases, or layered haze attributable to a single stationary emission source or a small group of emission sources; and
- Impairment due to widespread, regionally homogeneous haze resulting from the cumulative emissions of varied emission sources in a region.

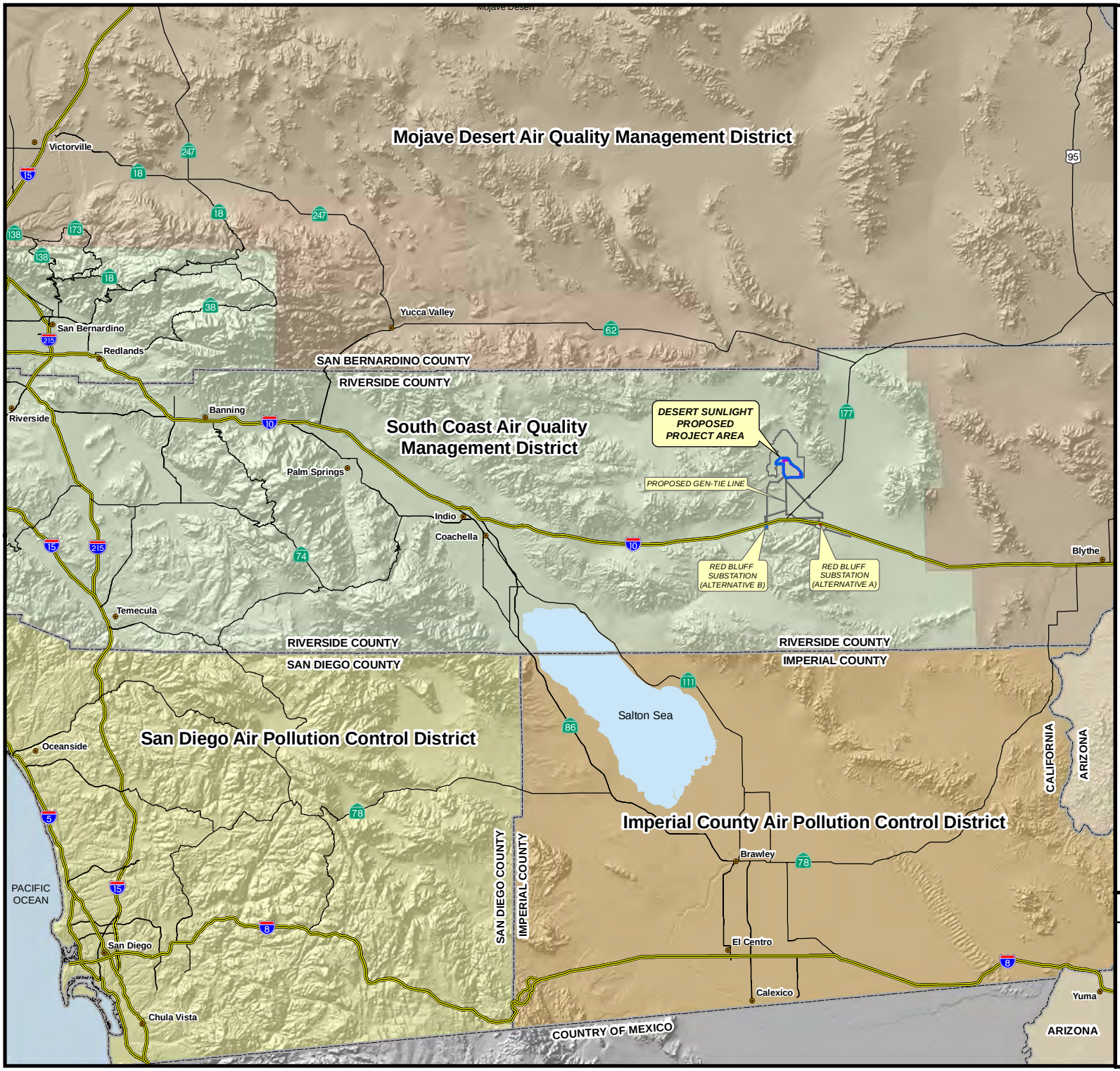
The PSD permit program addresses visibility impairment from nearby stationary emission sources. Regional haze impacts resulting from cumulative emissions in a region are being addressed through new SIP planning requirements. Visibility impairment, whether from stationary sources or from other sources, must be addressed under the regional haze program.

Various federal and state agencies operate the Inter-agency Monitoring of Protected Environments (IMPROVE) program to monitor visibility conditions and particulate matter concentrations in or near Class I areas across the country. There are 18 active IMPROVE monitoring sites in California, including one in Joshua Tree National Park. In addition to the visibility monitoring sites in the IMPROVE network, there are three National Atmospheric Deposition Monitoring Program (NADP) networks with stations in California. The National Trends Network (NTN) monitors wet deposition. There are 12 active NTN sites in California, including one in Joshua Tree National Park. The Clean Air Status and Trends Network (CASTNET) monitors dry deposition. There are six active CASTNET sites in California, including one in Joshua Tree National Park. There are three active mercury deposition network (MDN) monitoring sites in California. The MDN site closest to the Desert Center area is at Converse Flats south of Big Bear Lake in San Bernardino County.

Regulatory Considerations

In general, states have assumed primary responsibility for enforcing most federal industrial source emission standards and industrial source review requirements, with EPA exercising formal review and oversight responsibilities. Many states have independent air quality permit programs that extend to emission sources not covered by federal requirements. State air quality permit requirements generally are integrated with federal requirements, resulting in a consolidated permit program. Under most consolidated permit programs, basic state permit requirements apply to all sources that are not specifically exempted. Additional requirements (including EPA review of the permit) become applicable if sources exceed various size or emission thresholds.

In California, air quality regulation is a joint responsibility between CARB and local air quality management agencies. Local agencies are either a single county or a multi-county agency, typically called an Air Pollution Control District (APCD) or an Air Quality Management District (AQMD). APCDs and AQMDs have primary responsibility for most air quality regulatory programs, with CARB retaining oversight responsibilities. CARB directly implements statewide regulatory programs for motor vehicles, portable equipment, and hazardous air pollutants. Two different AQMDs have jurisdiction over portions of Riverside County. The South Coast Air Quality Management District (SCAQMD) has jurisdiction over most of Riverside County. The far eastern portion of Riverside County, however, is under the jurisdiction of the Mojave Desert Air Quality Management District (MDAQMD). *Figure* 3.2-1 shows the jurisdictional boundaries of the SCAQMD and MDAQMD in Riverside County. Areas near Desert Center are under the jurisdiction of the SCAQMD.



DESERT SUNLIGHT SOLAR FARM

Figure 3.2-1

Air Quality District Boundaries

The SCAQMD is the primary air quality regulatory agency for the Project vicinity. Most construction equipment items are classified as mobile sources, and thus are exempt from stationary source permit requirements. But other portable and stationary equipment such as generators, compressors, pumps, welders, diesel pile driving hammers, concrete batch plants, sand and gravel screening equipment, rock crushers, wood chippers, and tub grinders are potentially subject to SCAQMD permit requirements. SCAQMD Rule 219 list equipment types that are typically exempt from permit requirements. Equipment normally exempt from stationary source permit requirements includes:

- Equipment using a piston type internal combustion engine (typically using diesel, gasoline, or compressed gas fuels) that has a manufacturer rating of 50 horsepower or less;
- Equipment using a gas turbine engine that has a maximum heat input rate of 2,975,000 British thermal units (BTU) or less;
- Concrete mixers with a working capacity of one cubic yard or less;
- Portable equipment registered under the CARB statewide portable engine registration that remains at one fixed location for no more than 12 months; and
- Rental equipment located at one facility for no more than 12 months when the equipment owner has a valid AQMD permit or has registered the equipment under the statewide portable engine registration program.

The CARB statewide portable engine registration program is a voluntary program that establishes uniform emission limits and other requirements for eligible equipment. CARB-registered portable equipment items are exempt from local air district regulations and permit requirements as long as the equipment does not remain at a single fixed location (other than an equipment storage area) for more than 12 months (CARB 2009b). Portable equipment that is not registered under the statewide program or that remains at a single fixed location for 12 consecutive months or more is subject to local air district regulations and permit requirements unless it qualifies for exemption under other provisions of local air district rules and regulations. CARB-registered portable equipment remains exempt from air district permit requirements if it is relocated periodically within a project site for legitimate operational purposes, and is not at any single fixed location for 12 consecutive months.

In addition to possible permit requirements for some equipment used during project construction, the SCAQMD has adopted other regulations that affect facility construction and operation. Construction activities would be subject to fugitive dust control requirements (Rule 403). Rule 403 prohibits creation of dust plumes that are visible beyond the property line of the emission source, and requires all "active operations" (construction/demolition activities, earthmoving activities, heavy or light duty vehicle movements, or creation of disturbed surface areas) to implement applicable best available control measures as defined in the Rule. Best available dust control measures outlined in SCAQMD Rule 403 are summarized in Table 3.2-2 as general dust control measures. Enhanced dust control requirements apply if the project is considered a large operation. A large operation under Rule 403 is any active operations on property which contains 50 or more acres of disturbed surface area, or any earthmoving operation with a daily throughput volume of 5,000 cubic yards or more three or more times during the most recent 365-day period.

Table 3.2-2
General Dust Control Measures Required by SCAQMD Rule 403

Dust Source	Required Control Measures	Guidance
Mechanical or manual demolition	Stabilize wind-erodible surfaces to reduce dust. Stabilize surface soil where support equipment and vehicles will operate. Stabilize loose soil and demolition debris. Comply with AQMD Rule 1403 (asbestos from demolition and renovation).	Apply water in sufficient quantities to prevent visible dust plumes.
Clearing and grubbing	Water site before clearing and grubbing. Stabilize soil during clearing and grubbing. Stabilize soil at completion of clearing and grubbing.	Maintain live perennial vegetation where possible. Apply sufficient water to prevent generation of dust.
Cut and fill	Water soils before cutting and filling. Stabilize soils during and after cutting and filling.	For large sites, water with sprinklers or water trucks and allow time for water to penetrate. Water soils to depth of cut before subsequent cuts.
Earthmoving	Water to depth of proposed cuts. Reapply water as necessary to maintain dampness in soils and to ensure that visible dust does not extend more than 100 feet in any direction. Stabilize soils once earthmoving is complete.	Grade each project phase separately, timed to coincide with construction phase. Install upwind fencing to reduce material movement on-site. Apply water or a stabilizing agent in sufficient quantity to prevent the generation of dust.
Importing/exporting bulk materials	Stabilize material while loading to reduce dust emissions. Maintain at least six inches of freeboard on haul vehicles. Stabilize material while transporting to reduce dust emissions. Stabilize material while unloading to reduce dust emissions. Comply with Vehicle Code Section 23114.	Use tarps or other suitable enclosures on haul trucks. Check belly-dump truck seal regularly and remove any trapped rocks to prevent spillage. Comply with track-out prevention and mitigation requirements. Apply water while loading and unloading to reduce dust.
Stockpiles and bulk material handling	Stabilize stockpiled material. Stockpiles within 100 yards of off-site occupied buildings must not be greater than eight feet high, or must have a road bladed to the top to allow water truck access, or must have an operational water irrigation system capable of completely covering the stockpile.	Add and remove material from the downwind portion of the stockpile. Maintain storage piles to avoid steep sides or faces.
Truck loading	Water material before loading. Ensure that freeboard exceeds six inches (California Vehicle Code Section 23114).	Ensure that the loader bucket is close to the truck to minimize drop height while loading. Empty loader bucket so that no dust is generated.

Table 3.2-2 (continued)
General Dust Control Measures Required by SCAQMD Rule 403

Dust Source	Required Control Measures	Guidance
Staging areas	Stabilize staging areas during use. Stabilize staging area soils at project completion.	Limit the size of staging areas. Limit vehicle speeds to 15 miles per hour. Limit the size and number of staging area entrances and exits.
Traffic areas for construction activity	Stabilize all off-road traffic, parking areas, and haul routes. Direct construction traffic over established haul routes.	Apply gravel or paving as soon as possible to haul routes that will become future roadways. Construct barriers to restrict vehicles to established haul routes and parking areas.
Road shoulder maintenance	Apply water to unpaved road shoulders prior to clearing. Apply chemical dust suppressants and/or washed gravel to maintain a stabilized surface after completing road shoulder maintenance.	Installation of curbing and/or paving or road shoulders can reduce recurring maintenance costs. Use of chemical dust suppressants can inhibit vegetation growth and reduce future road shoulder maintenance costs.
Disturbed soil	Stabilize disturbed soil throughout the construction site and between structures.	Limit vehicle traffic and disturbances on soils where possible. If interior block walls are planned, install them as soon as possible. Apply water or stabilizing agents in sufficient quantity to prevent the generation of dust.
Trenching	Stabilize surface soils where trenchers, excavators, or support equipment will operate. Stabilize soils at completion of trenching.	Water soils before trenching. For deep trenching, first trench to 18 inches and soak deeper soils before continuing to trench to final depth. Wash mud and soil from trenching equipment at the conclusion of trenching.
Backfilling	Stabilize backfill material when not handling. Stabilize backfill material during handling. Stabilize soil at completion of activity.	Mix backfill material with water before moving. Dedicate a water truck or high capacity hose to backfilling equipment. Empty loader buckets slowly to avoid generating dust. Minimize drop height from loader bucket.
Crushing	Stabilize surface soil before operating support equipment. Stabilize material after crushing.	Follow permit conditions for crushing equipment. Water material before loading it into crusher. Monitor crusher emissions opacity. Apply water to crushed material to prevent dust.

Table 3.2-2 (continued)
General Dust Control Measures Required by SCAQMD Rule 403

Dust Source	Required Control Measures	Guidance
Screening	Water material before screening. Limit fugitive emissions to comply with opacity and plume length standards. Stabilize material immediately after screening.	Dedicate a water truck or high capacity hose to screening operations. Drop material through screen slowly and minimize drop height. Install a wind barrier with a porosity of no more than 50 percent and a height equal to the drop height on the upwind side of screening equipment.
Clearing Forms	Use water sprays, water sprays plus sweepers, or vacuum systems to clear forms.	Do not use high pressure air to clear forms because it may violate rule requirements.
Unpaved roads and parking lots	Stabilize soils to meet applicable performance standards. Limit vehicle travel to established haul roads and parking lots.	Restrict vehicle movements to established haul roads and parking lots to reduce the area requiring stabilization.
Landscaping	Stabilize soils, materials, and slopes.	Apply water to stabilize materials. Maintain materials in a crusted condition. Maintain effective cover over materials. Stabilize sloping surfaces with soil binders until vegetation or ground cover can stabilize the slopes. Hydroseed before the rainy season.
Turf overseeding	Apply sufficient water immediately prior to conducting turf vacuuming activities to meet opacity and plume length standards. Cover haul vehicles prior to exiting the site.	Haul waste material immediately off-site.
Vacant land	In instances where vacant lots are 0.10 acre or larger and have a cumulative area of 500 square feet or more that are driven over and/or used by motor vehicles and/or off-road vehicles, prevent motor vehicle and/or off-road vehicle trespassing, parking, and/or access by installing barriers, curbs, fences, gates, posts, signs, shrubs, trees, or other effective control measures.	

Source: SCAQMD 2005, Rule 403

Table 3.2-3 identifies enhanced dust control requirements applicable to large operations.

In addition to SCAQMD regulations, state regulations (California Code of Regulations, Title 13, Section 2449) would also affect construction activity. State regulations limit the unnecessary idling of off-highway vehicle and equipment engines (CARB 2008a, 2008d). Except when necessary for normal equipment operations, vehicle queuing, engine testing and maintenance, or for operator comfort and safety, vehicle idling for more than five minutes is prohibited.

Table 3.2-3
Enhanced Dust Control Measures Required for Large Operations by SCAQMD Rule 403

Dust Source	Required Control Measures
Earthmoving: Construction cut areas and mining	Conduct watering as necessary to prevent visible emissions from extending more than 100 feet beyond the active cut or mining area unless the area is inaccessible to watering vehicles due to slope conditions or other safety factors.
Earthmoving: Construction fill areas	Maintain soil moisture content at a minimum of 12 percent, as determined by the American Society for Testing and Materials (ASTM) Method D-2216 or other equivalent method approved by the Executive Officer, the CARB, and the EPA. For areas which have an optimum moisture content for compaction of less than 12 percent, as determined by ASTM Method D-1557 or other equivalent method approved by the Executive Officer, the CARB, and the EPA, complete the compaction process as expeditiously as possible after achieving at least 70 percent of the optimum soil moisture content. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations during each subsequent four-hour period of active operations.
Earthmoving except for mining operations or construction cut and fill areas	Either: Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM Method D-2216 or other equivalent method approved by the Executive Officer, the CARB, and the EPA. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations during each subsequent four-hour period of active operations. Or: For any earthmoving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.
Disturbed surface areas: Completed grading areas	Either: Apply soil stabilizers within five working days of grading completion. Or: Apply water to at least 80 percent of all inactive disturbed surface areas (excluding any areas which are inaccessible to watering vehicles due to excessive slope or other safety conditions) on a daily basis when there is evidence of wind-driven fugitive dust. Or: Establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter.
Disturbed surface areas except for completed grading areas	Apply dust suppression in sufficient quantity and frequency to maintain a stabilized surface. Any areas which cannot be stabilized, as evidenced by wind-driven fugitive dust, must have an application of water at least twice per day to at least 80 percent of the unstabilized area.
Inactive disturbed surface areas	Either: Apply water to at least 80 percent of all inactive disturbed surface areas (excluding any areas which are inaccessible to watering vehicles due to excessive slope or other safety conditions) on a daily basis when there is evidence of wind-driven fugitive dust. Or: Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface. Or: Establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter. Or: Use any combination of the above control actions such that, in total, these actions apply to all inactive disturbed surface areas.

Table 3.2-3 (continued)
Enhanced Dust Control Measures Required for
Large Operations by SCAQMD Rule 403

Dust Source	Required Control Measures
Open storage piles	Either: Apply chemical stabilizers. Or: Apply water to at least 80 percent of the surface area of all open storage piles on a daily basis when there is evidence of wind-driven fugitive dust. Or: Install temporary coverings. Or: Install a three-sided enclosure with walls having no more than 50 percent porosity which extend, at a minimum, to the top of the pile. This option may only be used at aggregate-related plants or at cement manufacturing facilities.
Unpaved roads	Either: Water all roads used for any vehicular traffic at least once every 2 hours during active operations (3 times per normal 8-hour work day). Or: Water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 miles per hour. Or: Apply a chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface.
All sources	Any other control measures approved by the Executive Officer and the EPA as equivalent to the measures specified in this table may also be used.

Source: SCAQMD 2005, Rule 403

As currently proposed, solar farm facilities would not require any stationary emission sources (such as backup generators) for facility operations. Power from existing local distribution lines would provide backup power to key facilities during Project operations. A backup generator may be required for the Red Bluff Substation, but any such generator is expected to be within the size range that is exempt from SCAQMD permit requirements. Although no SCAQMD air permits would be required for Project operations, various SCAQMD regulations could still apply to the Project. Paints or other architectural coatings used at facility buildings or on facility equipment would be subject to the volatile organic compound limits of SCAQMD Rule 1113. Cleaning solvents used for facility maintenance operations also may be subject to various requirements outlined in SCAQMD Rule 442 (Usage of Solvents) and SCAQMD Rule 1171 (Solvent Cleaning Operations).

Clean Air Act Conformity

Section 176(c) of the CAA requires federal agencies to ensure that actions undertaken in nonattainment or maintenance areas are consistent with the CAA and with federally enforceable air quality management plans. EPA has promulgated separate rules that establish conformity analysis procedures for highway/mass-transit projects (40 CFR Part 93, Subpart A) and for other (general) federal agency actions (40 CFR Part 93, Subpart B). General conformity requirements are potentially applicable to many federal agency actions, but apply only to those aspects of an action that involve on-going federal agency responsibility and control over direct or indirect sources of air pollutant emissions.

The EPA conformity rule establishes a process that is intended to demonstrate that the proposed federal action:

- Would not cause or contribute to new violations of federal air quality standards;
- Would not increase the frequency or severity of existing violations of federal air quality standards; and

- Would not delay the timely attainment of federal air quality standards.

The EPA general conformity rule applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. The emission thresholds that trigger requirements of the conformity rule are called de minimis levels. Emissions associated with stationary sources that are subject to permit programs incorporated into the SIP are not counted against the de minimis threshold.

Compliance with the conformity rule can be demonstrated in several ways. Compliance is presumed if the net increase in direct and indirect emissions from a federal action would be less than the relevant de minimis level. If net emissions increases exceed the relevant de minimis value, a formal conformity determination process must be followed. Federal agency actions subject to the general conformity rule cannot proceed until there is a demonstration of consistency with the SIP,

3.2.2 Existing Conditions

Air Quality

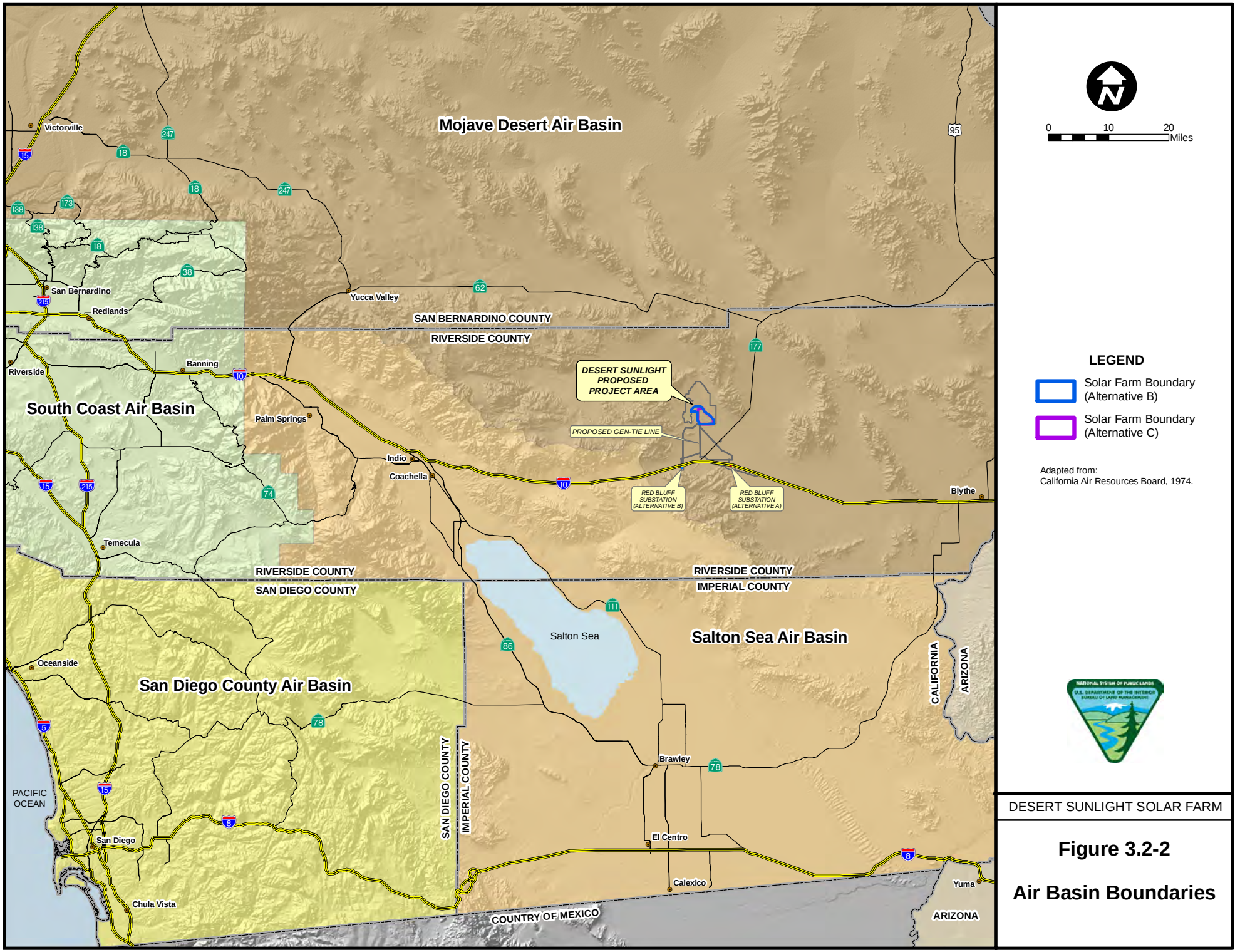
The air pollutants of greatest concern in Riverside County are ozone and suspended particulate matter (PM_{10} and $PM_{2.5}$). The seriousness of air pollution problems is greatest in the western portion of Riverside County and least in the eastern portion of Riverside County. Portions of Riverside County fall into three separate air basins:

- The South Coast Air Basin in western Riverside County (west of San Gorgonio Pass and the San Jacinto Mountains),
- The Salton Sea Air Basin in the Coachella Valley portion of Riverside County (between the San Jacinto Mountains and the Little San Bernardino Mountains), and
- The Mojave Desert Air Basin in eastern Riverside County (east of the Little San Bernardino Mountains, north of the Cottonwood Mountains, and east of the Orocopia Mountains).

Figure 3.2-2 shows the three air basins that include portions of Riverside County.

As can be seen by comparing *Figure* 3.2-2 with *Figure* 3.2-1, the Mojave Desert Air Basin portion of Riverside County is subdivided into a western portion under the jurisdiction of the SCAQMD and an eastern portion under the jurisdiction of the MDAQMD.

The Project area is located in the SCAQMD-jurisdiction portion of the Mojave Desert Air Basin. Most air quality monitoring stations in Riverside County are in the South Coast Air Basin and Salton Sea Air Basin portions of the County. There are no air quality monitoring stations near the proposed solar farm area. An air quality monitoring station in Blythe (48.5 miles east-southeast of the proposed solar farm site) measures ozone levels, but not other air pollutants. The National Park Service operates *three* air quality monitoring stations in Joshua Tree National Park. The Joshua Tree National Park *operates an air station (Pinto Wells) within five miles to the west of the proposed solar farm that measures for ozone, sulfur dioxide, and PM. A* station south of the Cottonwood Visitor Center is 24.5 miles west-southwest of the solar farm site, and measures ozone*, sulfur dioxide, and PM* levels. This monitoring station is at the northern edge of the Salton Sea Air Basin, and is more heavily influenced by pollutant transport from the South Coast Air Basin than are locations near Desert



DESERT SUNLIGHT SOLAR FARM

Figure 3.2-2

Air Basin Boundaries

Center. The Joshua Tree National Monument station is 59 miles northwest of the solar farm site near the Black Rock Campground in the northwest corner of the Park. This monitoring station is in San Bernardino County in the southwestern corner of the Mojave Desert Air Basin, and is more heavily influenced by pollutant transport from the South Coast Air Basin than are locations near Desert Center. The National Park Service also operates NTN wet deposition, Clean Air Status and Trends Network (CASTNet) dry deposition, and IMPROVE visibility monitoring stations in this same area. The Joshua Tree National Monument monitoring station measures ozone, sulfur dioxide, and PM_{10} concentrations, but only the ozone data are available in CARB data summaries.

There are several monitoring stations in the Riverside County and Imperial County portions of the Salton Sea Air Basin, but all of those monitoring stations are influenced by pollutant transport from the South Coast Air Basin. In addition, some of the Imperial County monitoring stations are influenced by pollutant transport from Mexico. Because the monitoring stations in Joshua Tree National Park and those in the Salton Sea Air Basin are more strongly influenced by pollutant transport from the South Coast Air Basin than in the Project area, data from those monitoring stations are not considered representative of air quality conditions in the Project area.

All federal ambient air quality standards are currently being met in the Mojave Desert Air Basin portion of Riverside County, but state standards for ozone and PM10 are occasionally exceeded.

Table 3.2-4 lists the federal and state attainment status designations applicable to the Mojave Desert portion of Riverside County.

Table 3.2-4
Federal and State Attainment Status Designations
in the Mojave Desert Air Basin Portion of Riverside County

Pollutant	Federal Designation	State Designation
Ozone	Unclassified/Attainment	Nonattainment
Nitrogen Dioxide	Unclassified/Attainment	Attainment
Carbon Monoxide	Unclassified/Attainment	Unclassified
Sulfur Dioxide	Unclassified	Attainment
PM_{10} (Inhalable Particulate Matter)	Unclassified	Nonattainment
$PM_{2.5}$ (Fine Particulate Matter	Unclassified/Attainment	Unclassified
Lead	No Federal Designation	Attainment
Sulfates	No Federal Standard	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified

Sources: US EPA (2010a); CARB (2010b)

Areas with unclassified or unclassified/attainment designations are treated as attainment areas. Because there are no federal nonattainment or maintenance designations in the Mojave Desert portion of Riverside County, federal agency actions in the Mojave Desert Air Basin portion of Riverside County are not subject to CAA conformity review requirements.

Visibility

The National Park Service has been monitoring visibility conditions in Joshua Tree National Park since 2001. Visibility can be impaired by haze caused by fine particles in the air, including dust. However, visibility monitoring data at Joshua Tree National Park suggest that the worst visibility days at Joshua Tree National Park are caused by increased ammonium nitrate emission levels.

Emission Sources

The most important emission sources in the project area are traffic on I-10, Highway 177, and other area roadways, agricultural operations on private lands, recreational vehicle use on public and private lands, fuel combustion associated with residential, commercial, and light industrial land uses, and wind erosion from lands with sparse vegetation.

Ground Conditions Affecting Wind Erosion

Wind can move soil particles by three general processes: surface creep (rolling along the ground surface), saltation (a bouncing movement along the ground surface caused by particle collisions that help force a particle into the air for a brief time before it falls back to the ground), and suspension transport (particles lofted into the air and remaining suspended for more than a minute). Surface creep and saltation typically account for most soil mass movement associated with wind erosion, and normally involve larger sand-size soil particles. Suspension transport normally involves smaller silt and clay size soil particles. From an air pollution standpoint, suspension transport of soil particles is the wind erosion process that generates fugitive dust.

The extent of fugitive dust generated by wind erosion is affected by numerous factors, including:

- Soil texture (the mix of clay, silt, and sand sized particles in a soil);
- Particle aggregation (mostly due to clay content);
- Organic matter content of soils;
- Non-erodible surface features (gravel, rocks, boulders, rock outcrops, etc.);
- Extent and density of vegetation cover;
- Surface crusting – mineral or biological crusts – especially between vegetation stems;
- Soil moisture conditions;
- Wind speed;
- Vertical air turbulence;
- Sedimentation of erodible material from upslope water erosion or from flood deposits; and
- Active disturbance of surface soils.

Soil moisture conditions and surface conditions are important factors determining the vulnerability of an area to wind erosion. In desert areas, soil moisture levels are high only during and after rainfall or flash flood events. Consequently, soil moisture levels in desert areas are high enough to influence wind erosion processes for only brief intermittent periods.

The surface features of greatest importance are non-erodible surface material, vegetation cover, mineralized soil crusts, and biological soil crusts. The most common types of non-erodible surface materials in deserts include scattered rocks and boulders, rock formation outcrops, and desert pavement. Desert pavements are areas with rock fragments of pebble to cobble size that cover an underlying layer of sand, silt, or clay. Desert pavement areas typically have little or no vegetation cover. The extent to which desert pavement reduces wind erosion and resulting fugitive dust depends on the density of the rock fragments covering the underlying soil.

Desert pavements seem to form from two different processes (McAuliffe 2000). On rocky alluvial fans, fine dust settling out of the air accumulates between and below the surface layer of rocks, eventually forming a relatively thin silt and clay layer that separates the surface rocks from the main part of the alluvial fan. Desert pavement also can form on sandy soils that contain significant amounts of gravel and rock fragments. In such situations, wind and water erosion can remove most of the sand and fine sediments from the surface, leaving the remaining rock fragments as the predominant surface layer.

Surveys of the proposed solar farm site indicate that there are areas of desert pavement in both the northwest and southwest portions of the site. An estimated 20 to 30 percent of the overall site has moderate to strong desert pavement, with an additional 5 to 15 percent of the overall site having weakly developed desert pavement (Earth Systems Southwest 2010a). The remainder of the solar farm site is typical Mojave Desert vegetation on a sandy soil. Vegetation coverage, mineral soil crusts, and biological soil crusts all help reduce fugitive dust from wind erosion from such areas. Existing vegetation at the solar farm site provides an estimated 15 percent canopy coverage, with little or no stable biological or mineral crusts in the open areas between desert shrubs (Hughes 2010).

Geotechnical studies conducted at the solar farm site indicate sandy soils throughout the site, with a typical silt plus clay content of 5 to 13 percent (Eberhart/United Consultants 2007; Earth Systems Southwest 2010b). The Natural Resources Conservation Service (NRCS) has conducted limited soil surveys on some private agricultural lands near Desert Center. Agricultural development of desert soils typically results in an increase in organic matter content, resulting in a more loamy texture to the soils than would occur without agricultural development. Agricultural lands near the solar farm site were generally characterized as gravelly loamy, coarse sand, or loamy sand with a high potential for wind erosion (Houdeshell 2010).

3.3 VEGETATION

3.3.1 Applicable Plans, Policies, and Regulations

Federal Regulations

Endangered Species Act of 1973

The Endangered Species Act (ESA) (16 USC 1531 et seq.) and subsequent amendments establish legal requirements for the conservation of endangered and threatened species and the ecosystems upon which they depend.

Section 7

Section 7 of the ESA requires federal agencies, in consultation with, and with the assistance of the Secretary of the Interior or the Secretary of Commerce, as appropriate, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification of critical habitat for these species. The US Fish and Wildlife Service (USFWS) and National Marine Fisheries Service share responsibilities for administering the Act. All listed plant species fall under the jurisdiction of the USFWS. Regulations governing interagency cooperation under Section 7 are found at 50 CFR Part 402. The biological opinion (BO) issued at the conclusion of a formal Section 7 consultation may include a statement authorizing a take that may occur incidental to an otherwise legal activity.

Clean Water Act

The Clean Water Act (33 USC 1251 et seq.) establishes legal requirements for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters.

Section 401

Section 401 requires that an applicant for a federal license or permit that allows activities resulting in a discharge to waters of the United States must obtain a State certification that the discharge complies with other provisions of the Clean Water Act. The Regional Water Quality Control Boards administer the certification program in California.

Section 404

Section 404 establishes a permit program administered by the US Army Corps of Engineers (USACE) regulating the discharge of dredged or fill material into waters of the United States, including wetlands. Implementing regulations by the USACE are found at 33 CFR Parts 320-330. Guidelines for implementation are referred to as the Section 404(b)(1) Guidelines and were developed by the EPA in conjunction with the USACE (40 CFR Parts 230). The Guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that would have less adverse impacts.

California Desert Protection Act of 1994

This act established Death Valley and Joshua Tree National Parks, the Mojave National Preserve, and the Granite Mountains National Reserve. It also declared certain lands in the California desert as wilderness, and included other natural resource designations and provisions.

Noxious Weed Act of 1974

This act provides for the control and management of nonindigenous weeds that injure or have the potential to injure the interests of agriculture and commerce, wildlife resources, or the public health. Under this act, the Secretary of Agriculture was given the authority to designate plants as noxious weeds, and inspect, seize and destroy products, and to quarantine areas, if necessary to prevent the spread of such weeds.

Executive Order 11988 Floodplain Management

This order directs all federal agencies to avoid the long-term and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.

Executive Order 11990 Protection of Wetlands

This order directs all federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative.

Executive Order 13112 Invasive Species

This order directs federal agencies to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause. To do this, the order established the National Invasive Species Council; currently there are 13 Departments and Agencies on the Council.

Compliance with Floodplain and Wetland Environmental Review Requirements

Established under 10 CFR Part 1022, this regulation establishes policy and procedures relating to the Department of Energy's (DOE) responsibilities under EO 11988 and 11990, including:

- DOE policy regarding the consideration of floodplain and wetland factors in DOE planning and decision making; and
- DOE procedures for identifying proposed actions located in a floodplain or wetland, providing opportunity for early public review of such proposed actions, preparing floodplain or wetland assessments, and issuing statements of findings for actions in a floodplain.

To the extent possible, DOE shall accommodate the requirements of EO 11988 and EO 11990 through applicable DOE NEPA procedures or, when appropriate, the environmental review process under the Comprehensive Environmental Response, Compensation, and Liability Act (42 USC. 9601 et seq.).

State Laws and Regulations

California Environmental Quality Act

The California Environmental Quality Act (CEQA) (PRC. 21000 *et seq.*) was enacted in 1970 to provide for full disclosure of environmental impacts on the public before state and local public agencies issue a permit. With regard to biological resources, CEQA gives consideration to "sensitive" (or "special status") plants, in addition to federal or state listed species. Sensitive species

include plants on the California Native Plant Society's (CNPS) [1] List 1A (presumed extinct), List 1B (rare, threatened, or endangered in California and elsewhere; eligible for state listing), or List 2 (rare, threatened, or endangered in California but more common elsewhere; eligible for state listing). To be conservative, CNPS List 3 (plants for which more information is needed) and List 4 (plants of limited distribution), are also considered sensitive.

California Endangered Species Act

The California Endangered Species Act (CESA) (Fish and Game Code 2050 *et seq*.) establishes the policy of the state to conserve, protect, restore, and enhance threatened or endangered species and their habitats. CESA mandates that state agencies should not approve projects that would jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. There are no state agency consultation procedures under CESA. For projects that affect a species listed under both CESA and the federal ESA, compliance with the federal ESA will satisfy CESA if the California Department of Fish and Game (CDFG) determines that the federal incidental take authorization is consistent with CESA under Fish and Game Code Section 2080.1. For projects that will result in a take of a state-only listed species, the applicant must apply for a take permit under Section 2081(b).

Native Plant Protection Act

California's Native Plant Protection Act (Fish and Game Code 1900-1913) requires all State agencies to utilize their authority to carry out programs to conserve endangered and rare native plants. Provisions of the Native Plant Protection Act prohibit the taking of listed plants from the wild and require notification of the CDFG at least 10 days in advance of any change in land use. This allows CDFG to salvage listed plant species that would otherwise be destroyed. The applicant is required to conduct botanical inventories and consult with CDFG during project planning to comply with the provisions of this act and sections of CEQA that apply to rare or endangered plants.

Streambed Alteration Agreements, California Fish and Game Code, Sections 1600 – 1616

Under these sections of the Fish and Game Code, CDFG jurisdiction is determined to occur within the water body of any natural river, stream or lake. The term "stream", which includes creeks and rivers, is defined in Title 14, CCR, Section 1.72. The applicant is required to notify CDFG prior to constructing any project that would divert, obstruct or change the natural flow, bed, channel, or bank of any river, stream, or lake. Preliminary notification and project review generally occur during the environmental process. When an existing fish or wildlife resource may be substantially adversely affected, CDFG is required to propose reasonable project changes to protect the resource. These modifications are formalized in a Streambed Alteration Agreement that becomes part of the plans, specifications, and bid documents for the project.

[1] *CDFG has changed references to CNPS Lists to California Rare Plant Rank (CRPR) to clarify that CDFG plays an active and authoritative role in the ranking process. See September 2010 CNDDB newsletter: http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/CNDDB_News_Sep_2010.pdf. The change does not affect the list numbering system or conservation status of any plant species.*

Bureau of Land Management Plans and Guidelines

California Desert Conservation Area Plan

The California Desert Conservation Area (CDCA) is a 25-million acre expanse of land in southern California designated by Congress in 1976 through the Federal Land Policy and Management Act (FLPMA). BLM administers about 10 million of those acres. When Congress created the CDCA, it recognized its special values, proximity to the population centers of southern California, and the need for a comprehensive plan for managing the area. Congress stated that the CDCA Plan must be based on the concepts of multiple use, sustained yield, and maintenance of environmental quality. The proposed Project falls within the CDCA.

The Vegetation Element of the CDCA Plan contains the following goals: to conserve federally- and State-listed rare, threatened, or endangered plants and to further the purposes of the ESA and similar State laws; to treat unusual plant assemblages that rate as highly sensitive and very sensitive in a manner that will preserve their habitat and ensure their continued existence; to manage wetland and riparian areas in the desert; to sustainably maintain the continued existence and biological viability of the vegetation resource in the CDCA while providing for the consumptive needs of wildlife, livestock, wild horses and burros, and public uses; to provide guidance for the manipulation of plant habitats or vegetation; and to encourage the use of private desert lands for commercial production of valuable desert plants. The plan identifies the need for monitoring efforts and directing these efforts to those areas with the greatest management need.

Northern and Eastern Colorado Desert Coordinated Management Plan/EIS

The Northern and Eastern Colorado Desert Coordinated Management Plan/EIS (NECO Plan/EIS) is a landscape-scale, multi-agency planning effort that seeks to protect and conserve natural resources while simultaneously balancing human uses of the California portion of the Sonoran Desert ecosystem. The NECO planning area, which is located in the southeastern CDCA, encompasses over 5 million acres and hosts 60 sensitive plant and animal species. The NECO Plan/EIS amends BLM's CDCA Plan. This multiple use planning effort also takes into account other uses of the desert, such as hiking, hunting, rock hounding, off-highway recreation, commercial mining, livestock grazing, and utility transmission. The NECO Plan/EIS provides integrated ecosystem management for special status species and natural communities for all federal lands, and regional standards for public land health for BLM lands.

Cacti and Yucca Removal Guidelines

The BLM normally requires transplanting or salvage of certain native plant species that would be lost to development on lands under its jurisdiction. Species that typically require salvage regardless of their height in this region include yuccas (*Yucca* spp.), ocotillo (*Fouquieria splendens*), and cacti. For chollas (*Cylindropuntia* spp.), the plant must be less than three feet in height to require salvaging, as all plants greater than three feet in height will not be salvaged but left on-site to be destroyed by clearing activities.

Regional and Local Regulations

County of Riverside General Plan

The open space policy relevant to vegetation is defined in the Desert Center Area Plan (DCAP) within the Riverside County General Plan as follows:

DCAP 10.1 Encourage clustering of development for the preservation of contiguous open space.

3.3.2 Methodology

The Project Study Area encompasses approximately 19,516 acres originally considered for siting of the project components. Initial surveys for biological resources were conducted within this larger Project Study Area. The Project Study Area and locations of each alternative are shown in Figures 3.3-1 through 3.3-3. Additional acreage was added to the Project Study Area to accommodate changes to the footprint of various project components, including the eastern substation (Red Bluff Substation A) and associated Gen-Tie Lines (GT-A-1 and GT-A-2). *Thus, appropriate biological resource surveys included all Project areas currently under consideration. In addition to biological resource surveys all sites with active or partially stabilized sand dunes were also covered by an aeolian geomorphology evaluation (Solar Farm site layouts B and C).*

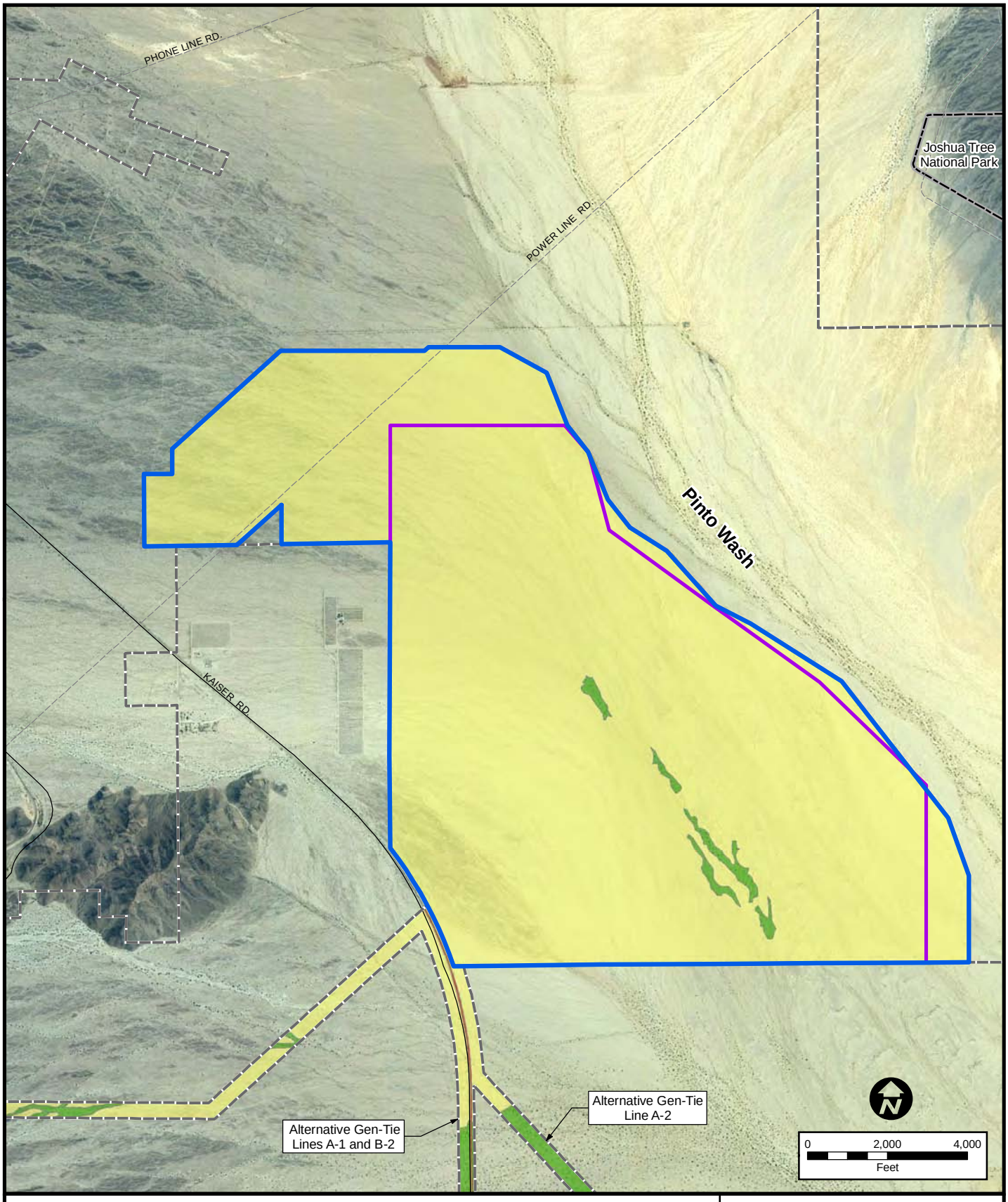
Prior to conducting any biological surveys, a biological resources literature search was performed. This included researching information from regional documents such as the NECO Plan/EIS (BLM and CDFG 2002), and the Biological Opinion (BO) for the NECO Plan/EIS (USFWS 2005). Searches of the CDFG's California Natural Diversity Database and the CNPS Electronic Inventory were conducted to determine the sensitive species that have been documented in the proposed project vicinity. These searches included a radius of five miles surrounding the Project Study Area.

In addition, surveyors reviewed environmental documents for nearby proposed renewable energy projects that included extensive biological surveys, including the Palen Solar Power Project (BLM 2010a) and the Genesis Solar Energy Project (Genesis Solar 2009), which are approximately 10 miles (Palen) and 17 miles (Genesis) southeast of the Project Study Area, respectively. These reports were reviewed to determine whether any sensitive species found during surveys of those project sites might be relevant to this proposed project. Literature reviews were augmented by the professional judgment of qualified biologists before surveys were conducted.

Using this information and observations in the field, a list was generated of special status plant species that have the potential to occur within the Project Study Area. For assessment purposes, special status species were defined as plants that:

- Have been designated as either rare, threatened, or endangered by CDFG or the USFWS, and are protected under either the ESA or CESA;
- Are proposed species for listing under those same acts;
- Are included in the CNPS Inventory of Rare and Endangered Plants (Lists 1 through 4);
- Meet the definition of endangered, rare, or threatened under CEQA Guidelines, Section 15380; or
- Are considered special status species in local or regional plans, policies, or regulations, such as the NECO Plan/EIS.

X:\GIS\Desert_Sunlight\MXD_Files\Veg_SF.mxd



Source: Ironwood Consulting, Inc. 2010

LEGEND

Vegetation Communities

- Desert Dry Wash Woodland
- Sonoran Creosote Bush Scrub
- Developed/Agriculture

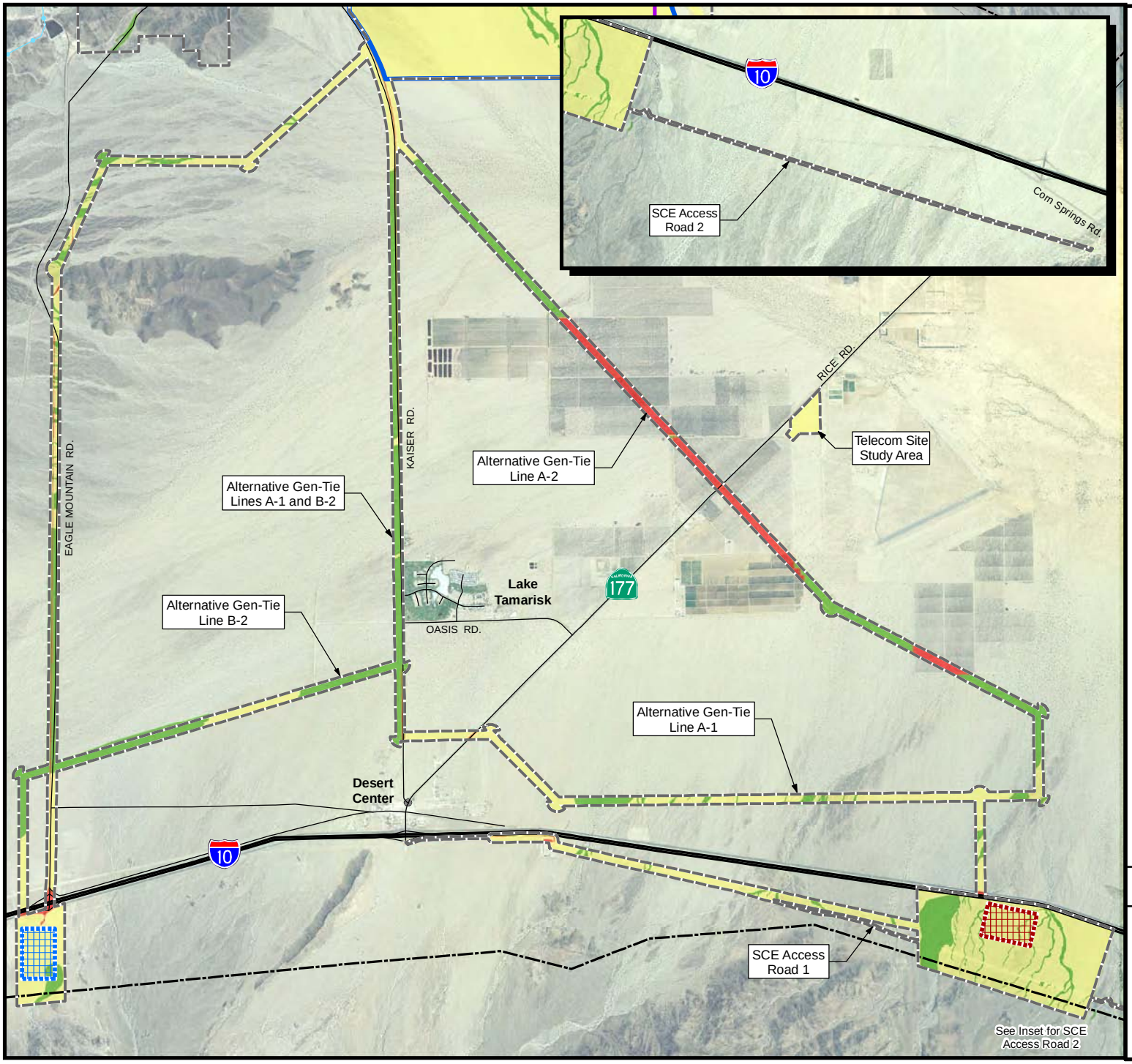
- Desert Sunlight Study Area Boundary
- Solar Farm Boundary (Alternative B)
- Solar Farm Boundary (Alternative C)

DESERT SUNLIGHT SOLAR FARM

Figure 3.3-1

Vegetation Communities (Solar Farm Site)

X:\GIS\Desert_Sunlight\MXD_Files\Veg_Gen-Tie.mxd



0 3,000 6,000
Feet

LEGEND

- Desert Sunlight Study Area Boundary
- Solar Farm Boundary (Alternative B)
- Solar Farm Boundary (Alternative C)
- Red Bluff Substation (Alternative A)
- Red Bluff Substation (Alternative B)
- Devers-Palo Verde Transmission Line (DPV1)

Vegetation Communities

- Desert Dry Wash Woodland
- Sonoran Creosote Bush Scrub
- Developed/Agriculture

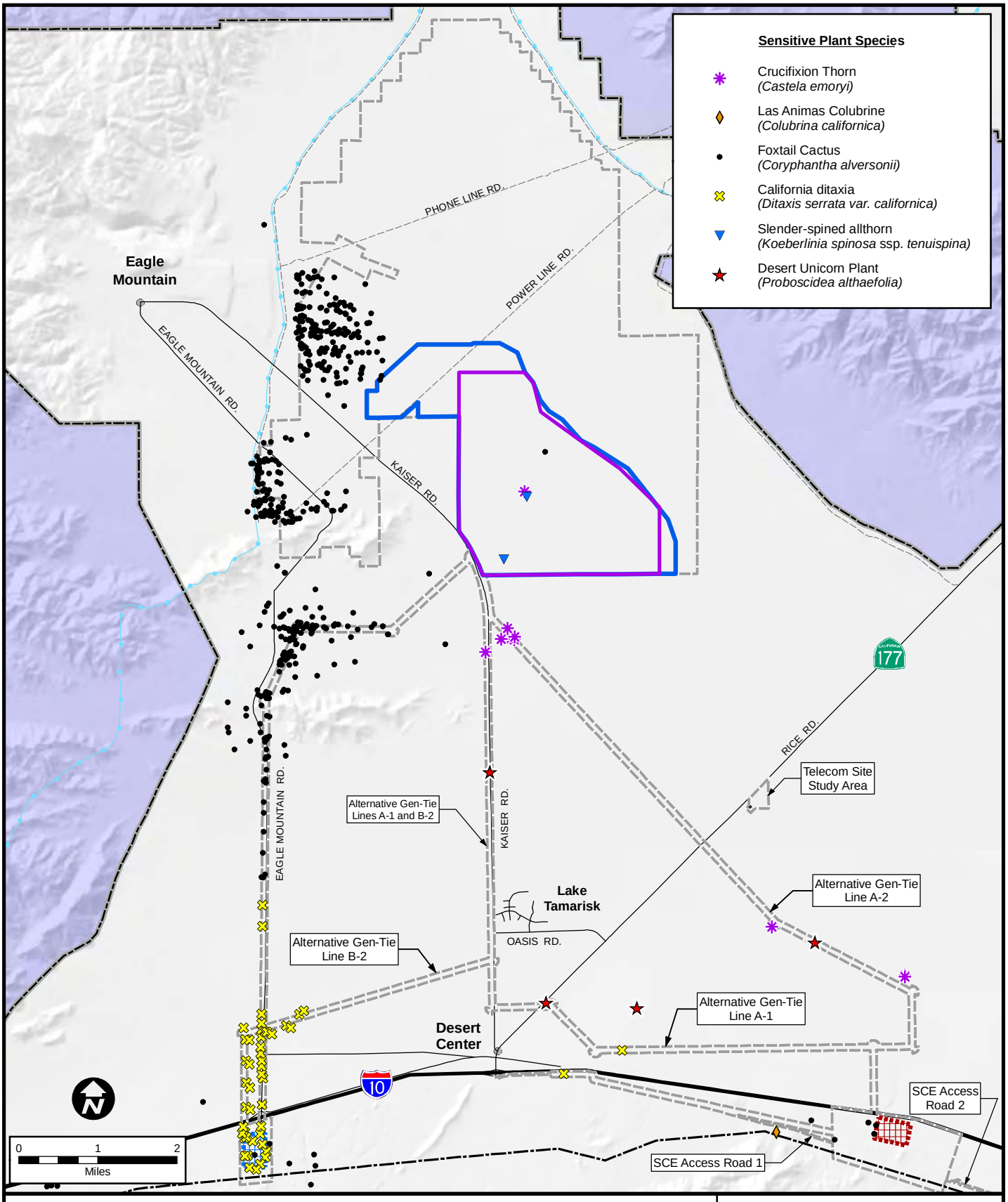
Source: Ironwood Consulting, Inc. 2010

DESERT SUNLIGHT SOLAR FARM

Figure 3.3-2

Vegetation Communities (Gen-Tie Lines and Substations)

X:\GIS\Desert_Sunlight\MXD_Files\Sen_Plants.mxd



LEGEND

- Desert Sunlight Study Area Boundary
- Solar Farm Boundary (Alternative B)
- Solar Farm Boundary (Alternative C)
- Devers-Palo Verde Transmission Line (DPV1)
- Red Bluff Substation (Alternative A)
- *Red Bluff Substation (Alternative B)*
- Joshua Tree National Park Boundary
- Aqueduct

Source: Ironwood Consulting, Inc. 2010

DESERT SUNLIGHT SOLAR FARM

Figure 3.3-3

Sensitive Plant Species

A description of each of these types of special status species is presented in Table 3.3-1.

Table 3.3-1
Definitions of Special Status Species Under Consideration in this EIS

Species Designation	Agency	Definition
Endangered	USFWS	A species that is in danger of extinction throughout all or a significant portion of its range.
Threatened	USFWS	Any species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.
Proposed	USFWS	A species for which the USFWS has sufficient information on its biological status and threats to propose it as endangered or threatened under the ESA.
Covered under the NECO Plan/EIS	BLM	Special status species that were addressed in the NECO Plan/EIS due to management concerns within the NECO Planning Area.
Endangered	CDFG	A native species or subspecies that is in serious danger of becoming extinct throughout all or a significant portion of its range due to one or more causes, including loss or change in habitat, overexploitation, predation, competition, or disease.
Threatened	CDFG	A native species or subspecies that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of special protection and management efforts.
Rare	CDFG	A species that, although not presently threatened with extinction, is in such small numbers throughout its range that it may become endangered if its present environment worsens.
Candidate	CDFG	A native species that has been officially noticed by the California Fish and Game Commission as being under review by the CDFG for addition to the threatened or endangered species lists. CDFG candidate species are given no extra legal protection under state laws.
List 1A	CNPS	Plants presumed to be extinct in California.
List 1B	CNPS	Plants rare, threatened, or endangered in California and elsewhere.
List 2	CNPS	Plants rare, threatened, or endangered in California but more common elsewhere.
List 3	CNPS	Plants about which more information is needed—a review list.
List 4	CNPS	Plants of limited distribution—a watch list.

CNPS-listed species also have "threat ranks" as an extension to the list number, which designates the level of endangerment by a 0.1 to 0.3 ranking, with 0.1 being the most endangered and 0.3 being the least endangered. A threat rank is *assigned* for all List 1B, List 2 and most of List 3 and List 4 species. A threat rank of 0.1 indicates that a plant is seriously endangered in California (high degree/immediacy of threat), 0.2 indicates that a plant is fairly endangered in California (moderate degree/immediacy of threat), and 0.3 indicates that a plant is not very endangered in California (low degree/immediacy of threats or no current threats known). No List 1A plants and only some List 3 and List 4 plants have a threat rank extension.

Preliminary biological resources surveys were conducted within the Project Study Area in 2007. The purpose of the surveys was to provide preliminary habitat descriptions within the Project Study Area, describe the need for focused surveys for special status species, and summarize potential

biological constraints for the proposed Project. The size of the Project Study Area and the description of the proposed solar facility have changed since the 2007 surveys. The current Project locations and Project Study Area are shown in Figures 3.3-1through 3.3-3. A subsequent Biological Resources Technical Report (BRTR) (Appendix H) incorporates the results of the 2007 surveys, as well as all subsequent surveys, into the characterization of the biological resources of the current Project locations. The discussion of the existing biological setting is based upon information in the BRTR (Ironwood Consulting 2010a).

Floristic surveys were conducted between March 15 and April 9, 2010 *and November 8th through November 12, 2010, within the Project Study Area and thus all of the Project areas currently under consideration have been fully surveyed.* These surveys conformed to the following protocols, as described in more detail in the BRTR contained in Appendix H:

- *Protocols for Surveying and Evaluating Impacts on Special Status Native Plant Populations and Natural Communities* (CDFG 2009);
- *Survey Protocols Required for NEPA/ESA Compliance for BLM Special Status Plant Species* (BLM 2009a); and
- *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants* (USFWS 1996).

These surveys included identifying every plant observed within the survey area to the level necessary (species or subspecies/variety) to determine its special status, if any.

A jurisdictional waters delineation was conducted in spring of 2010 and updated in the summer of 2010 within the Project locations to map any wetlands, desert dry washes, and desert dry wash woodlands (Ironwood Consulting and Huffman-Broadway Group 2010). The delineation determined both USACE and CDFG jurisdictions. The study was conducted in accordance with the Code of Federal Regulations definitions of jurisdictional waters, the *Wetlands Delineation Manual* (USACE 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (USACE 2008a), *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar and McColley 2008*), and supporting guidance documents, such as the current guidance from EPA and USACE (2008) regarding CWA jurisdiction after the U.S. Supreme Court's decision in Rapanos v. Unites States regarding isolated, non-navigable, intrastate waters* (USACE 2008b).

In summary, Project facility and associated Project components for the proposed and alternative Project features were surveyed for biological resources. *In addition to biological resource surveys,* the aeolian geomorphology evaluation covered Solar Farm site *layouts B and C; these were the only sites with potential to affect active or partially stabilized dune habitat*. Data collected during surveys documents the baseline conditions for biological resources.

3.3.3 Soils and Topography

Although soils associated with the Project Study Area have not been surveyed by the Natural Resource Conservation Service (NRCS), the geotechnical survey of the site and field observations made by Ironwood Consultants found that soils on the Project Study Area were essentially uniform in nature and primarily sandy in texture. Soils primarily consist of undifferentiated younger alluvium, younger alluvium with interspersed areas of weak desert pavement, and

older alluvium with moderate to strong desert pavement (Earth Systems Southwest 2010). Older alluvial fan deposits supported uplands with desert pavement (manganese and iron oxidized coatings on cobbles and sand) covering older alluvial fan material. Drainages occurring within the older alluvial fans have active younger sediments consisting of fine to coarse sand, interbedded with clay, silt and gravel with no evidence of desert pavement.

Multiple alluvial fans flow into Big Wash (located south of the Solar Farm site layouts B and C and crosses the Gen-Tie Line alternatives) and Pinto Wash (located immediately east of the Solar Farm site layouts B and C). Aeolian sand deposits are located within the Project Study Area but outside of all project component Study Areas. Stabilized sand sheets and pockets of sand dune deposits are located east of the Solar Farm site (layouts B and C) and both solar farm layout sites lack aeolian (wind-blown) sand formations. The western extent of the Chuckwalla Valley is defined by a broad alluvial system that flows east through the Project Study Area. It is fed by numerous alluvial fans and crosses the Gen-Tie Line alternative alignments before it joins with the lower reaches of Big Wash.

The Red Bluff Substation A and related component areas are located at the base of a bajada of the Chuckwalla Mountains. Broad, active alluvial fans dominated by larger rock and gravelly soils are juxtaposed with upland mounds with well-developed desert pavement. Several incised washes occur in this region. Red Bluff Substation B Study Area consists of two distinct soil conditions: sandy soils emanating from an active alluvial fan in the southern half and a caliche outcrop in the southern half. Channels of the alluvial fan develop into narrow washes and flow into control dykes built for flood protection.

3.3.4 Vegetation Communities

Creosote Bush-White Bursage Series (Sawyer and Keeler-Wolf 1995; analogous to Holland's Mojavean and Sonoran desert scrubs, 1986) and Blue Palo Verde-Ironwood-Smoke Tree Series (ibid., analogous to Holland's and NECO's desert dry wash woodland, 1986) are the two vegetation communities found within the Project locations (Figures 3.3-1 and 3.3-2). In addition, disturbed areas are also found within the Project locations, as described in more detail below.

Creosote Bush – White Bursage Series (Creosote Desert Scrub)

The majority of the Project Study Area supports a creosote desert scrub community, *which is a type of desert scrub habitat. Desert scrub habitat is well developed on valley floors and lower bajadas. Soils are well drained and coarse, and salt content in the soil ranges from low to high concentrations of calcium carbonate and other salts. These high concentrations of salts form a hardpan as a subsurface (Mayer, et al 1988).*

Dominant plant species associated with this community include creosote bush (*Larrea tridentata*), burro bush (*Ambrosia dumosa*), boxthorn (*Lycium* sp.), brittlebush (*Encelia farinosa*), indigo bush (*Psorothamnus* spp.), and cheesebush (*Hymenoclea salsola*). Local diversity of creosote scrub varied throughout the Project Study Area. This community was relatively more structurally diverse within the stable, older alluvial fan systems located in the northwestern and southwestern portions of the Solar Farm alternatives than in active alluvial fan systems located in the middle and southern extent of the Solar Farm alternatives.

Blue Palo Verde-Ironwood-Smoke Tree Series (Desert Dry Wash Woodland)

Within the Project Study Area, Blue Palo Verde-Ironwood-Smoke Tree series (desert dry wash woodland) community occurs in the areas designated as desert dry wash woodland (Figure 3.3-2). *Soils of desert wash habitats tend to be sandy to gravelly; some wash plants may be found on a variety of soils. This habitat is often found in association with canyons, arroyos, washes, and other features that contain water for at least*

part of the year, which is essential for habitat to persist. Desert washes are restricted to areas of greater water availability (Mayer, et al 1988).

Plant species typical of this community found on the site include blue palo verde (*Cercidium floridum*), ironwood (*Olneya tesota*), smoke tree (*Psorothamnus spinosa*), and desert willow (*Chilopsis linearis*). Desert dry wash woodland does not have standing *or running surface* water during most of the year, except after storms. However, *the dominant and characteristic species in* this habitat*, once they mature, are deep-rooted trees (phreatophytes; Rundel and Gibson 1996; Schoenherr and Burk 2007.) By contrast, most desert plants are dependent upon percolating seasonal surface water; their root systems do not reach deeper groundwater sources. In desert washes, the characteristic woodland species persist on surface water sources until they eventually develop deeper root systems. Due to seasonal runoff and infrequent storm flows, the wash habitats provide greater and more frequent soil moisture than surrounding bajadas, enabling young phreatophytes to become established and eventually develop their deep root systems. When they mature, these trees become at least partly dependent upon groundwater. Depth to permanent groundwater in desert washes is essentially the same as the surrounding landscape.*

Disturbed Areas

Disturbed, ruderal, and non-vegetated areas are found in association with roads within the Project locations and previously developed areas around wells and associated features such as drainage basins. Disturbed areas are found on 2 acres of GT-A-1, 20 acres of GT-A-2, 2 acres of GT-B-2, and 1 acre of Red Bluff Substation A (Access Road 1).

Invasive Plant Species

Invasive plants are introduced species that can thrive in areas beyond their natural range of dispersal. These plants are characteristically adaptable, aggressive, and have a high reproductive capacity. Their vigor combined with a lack of natural enemies often leads to outbreak populations (USDA 2010). Invasive plant species have degraded most natural communities in the southwestern U.S. They often displace and outcompete native species, and have the potential to alter fire and hydrologic regimes.

Within the Project Study Area, the prevalence of invasive species is low, but is higher in disturbed areas. Invasive plant species that can be found in the Project Study Area include Mediterranean splitgrass (*Schismus barbatus*), red brome (*Bromus madritensis* ssp. *rubens*), crane's bill (*Erodium cicutarium*), and Tournefort's mustard (*Brassica tournefortii*).

3.3.5 Special Status Plant Species

After review of plant occurrence records, a list was developed of 14 special status plant species that are present in the area and that might occur within the Project Study Area. Table 3.3-2 lists each of these species and whether its presence was confirmed and as illustrated in Figure 3.3-3. They include: *Coryptantha alversonii* (foxtail cactus), Emory's crucifixion thorn (*Castela emoryi*), Las Animas colubrina (*Colubrina californica*), California ditaxis (*Ditaxis serrata* var. *californica*), desert unicorn plant (*Proboscidea althaeifolia*), and slender-spined allthorn (*Koeberlinia spinosa* ssp. *tenuispina*), and are discussed in more detail in the BRTR. All of these plant species are on the CNPS list, but none of them are federally or state listed or proposed for listing.

Table 3.3-2
Special Status Plant Species with the Potential to Occur in the Project Study Area

Scientific Name **Common Name**	**Status**	**Potential for Occurrence Alternative 1/ Alternative 2/ Alternative 3[1]**
Coachella Valley milk-vetch *Astragalus lentiginosus* var. *coachellae*	Federal: Endangered State: None CNPS[2]: 1B.2 BLM: Covered under the NECO[3] Plan	U/U/U
Foxtail cactus *Coryptantha alversonii*	Federal: None State: None CNPS: 4.3 BLM: Covered under the NECO Plan	C/C/C
Harwood's milk-vetch *Astragalus insularis* var. *harwoodii*	Federal: None State: None CNPS: 2.2 BLM: Covered under the NECO Plan	U/U/U
Ayenia *Ayenia compacta*	Federal: None State: None CNPS: 2.3 BLM: Not covered under the NECO Plan	U/U/U
Emory's crucifixion thorn *Castela emoryi*	Federal: None State: None CNPS: 2.3 BLM: Covered under the NECO Plan	C/C/C
Las Animas colubrina *Colubrina californica*	Federal: None State: None CNPS: 2.3 BLM: Covered under the NECO Plan	C/P/P
Glandular ditaxis *Ditaxis claryana*	Federal: None State: None CNPS: 2.2 BLM: Covered under the NECO Plan	U/U/U
California ditaxis *Ditaxis serrata* var. *californica*	Federal: None State: None CNPS: 3.2 BLM: Covered under the NECO Plan	C/C/P
Spearleaf *Matelea parvifolia*	Federal: None State: None CNPS: 2.3 BLM: Covered under the NECO Plan	U/U/U
Desert unicorn plant *Proboscidea althaeifolia*	Federal: None State: None CNPS: 4.3 BLM: Covered under the NECO Plan	C/C/C
Orocopia sage *Salvia greatae*	Federal: None State: None CNPS: 1B.3 BLM: Covered under the NECO Plan	U/U/U

Table 3.3-2 (continued)
Special Status Plant Species with the Potential to Occur in the Project Study Area

Scientific Name **Common Name**	**Status**	**Potential for Occurrence Alternative 1/ Alternative 2/ Alternative 3[1]**
Desert spike-moss *Selaginella eremophila*	Federal: None State: None CNPS: 2.2 BLM: Covered under the NECO Plan	U/U/U
Cove's senna *Senna covesii*	Federal: None State: None CNPS: 2.2 BLM: Covered under the NECO Plan	U/U/U
Slender-spined allthorn (Crown-of-thorns) *Koeberlinia spinosa* ssp. *tenuispina*	Federal: None State: None CNPS: 2.2 BLM: Covered under the NECO Plan	C/C/C

[1]Potential for occurrence:
U: Unlikely
P: Potential
C: Confirmed
[2] CNPS Status:
1B.3= rare, threatened, or endangered in CA, however, there is a low degree or immediacy of threats.
2.2= fairly threatened in CA, more common elsewhere.
2.3 = not very threatened in CA, more common elsewhere.
3.2 = fairly threatened in CA, need more information on this species.
4.3 = not very [3]threatened in CA, plants of limited distribution (watch list).
[3] Northern and Eastern Colorado Desert Coordinated Management Plan (NEC0)

A brief description of each special status plant species is provided below.

The Coachella Valley milk-vetch (*Astragalus lentiginosus* var. *coachellae*), a federal listed endangered plant species, has been recorded near the Project Study Area. During surveys, a number of individuals were observed that were similar to Coachella Valley milk-vetch. Discussions with a Joshua Tree National Park botanist and the Herbarium at Rancho Santa Ana Botanic Garden led to the conclusion that the individuals that were observed were actually the freckled milk-vetch (*Astragalus lentiginosus* var. *variabilis*), which is not a special status species. As such, the Coachella Valley milk-vetch was not observed during surveys. Further, the previously recorded observation near the Project Study Area was also a misidentification of the species. Suitable habitat for this species, sandy Sonoran desert scrub and windblown sand dunes, *occurs within the larger Project Study Area but* does not occur within any of the Project *component* locations *(Solar Farm, substation, or gen-tie line alternatives)*. Thus, *Coachella Valley milk-vetch* is considered unlikely to occur in the Project locations.

Foxtail cactus (*Coryptantha alversonii*) is a CNPS List 4.3 species belonging to the cactus family (Cactaceae). This low-lying cactus is typically found in rocky soils on hills, mountains, margins of washes, and bajadas dominated by Sonoran desert scrub. During surveys, *five* and *two* individuals were observed within the footprints of Alternatives 1 and 2, respectively, and *five* individuals were observed within Alternative 3.

Harwood's milk-vetch (*Astragalus insularis* var. *harwoodii*) is a CNPS List 2.2 annual herb belonging to the pea family (Fabaceae). It is historically known to occur in *creosote bush scrub communities of the Sonoran Desert on desert dunes in sandy or gravelly areas at elevations ranging from 0 to 990 feet (0 to 300 meters). Although sand dunes do not occur within the Project Study Area sites, habitat in the form of sandy and gravelly areas within creosote bush scrub habitat is found in the project footprint; however, this species was not found during surveys for the Project and the nearest recorded occurrence of Harwood's milk-vetch is approximately eight miles south of the Project Study Area. Therefore, this species is unlikely to occur within the Project locations.*

Ayenia (*Ayenia compacta*) is a CNPS List 2.3 perennial herb belonging to the cacao family (Stericuliaceae). It is historically known to occur in Mojavean desert scrub and rocky Sonoran desert scrub at elevations ranging from 500 to 3,600 feet (150 to 1,095 meters). Both of these vegetation communities occur within the Project Study Area, however, the nearest recorded occurrence of ayenia is approximately 12 miles south of the Project Study Area and this species was not found during surveys for the Project. Therefore, this species is unlikely to occur within the Project locations.

Emory's crucifixion thorn (*Castela emoryi*) is a CNPS List 2.3 perennial deciduous shrub belonging to the quassia family (Simaroubaceae). It is historically known to occur in Mojavean desert scrub, playas, and gravelly Sonoran desert scrubs at elevations ranging from 300 to 2,200 feet (90 to 670 meters). All of these environmental conditions occur within the Project Study Area and there is a record of Emory's crucifixion thorn approximately 2.5 miles south of the layouts of SF-A, SF-B, and SF-C, near GT-A-1. During surveys, *one* individual was observed within the footprints of Alternatives 1 and 2, respectively, and *three* individuals were observed within Alternative 3.

Las Animas colubrina (*Colubrina californica*) is a CNPS List 2.3 perennial deciduous shrub belonging to the buckthorn family (Rhamnaceae). It is historically known to occur in both Mojavean and Sonoran desert scrub at elevations ranging from 0 to 3,200 feet (0 to 1,000 meters). This species typically occurs in dry canyons with sandy, gravelly soils (BLM 2002). These vegetation communities occur within the Project Study Area, and there is a recorded occurrence of Las Animas colubrina approximately four miles southwest of the Project Study Area. *No individuals were found within the proposed project's disturbance footprint, but two individuals were observed within the Study Area footprints of Alternatives 1 and 3.*

Glandular ditaxis (*Ditaxis claryana*) is a CNPS List 2.2 perennial herb belonging to the spurge family (Euphorbiaceae). It is historically know to occur in Mojavean desert scrub and sandy Sonoran desert scrub at elevations ranging from 0 to 1,500 feet (0 to 465 meters). These vegetation communities and elevations occur within the Project Study Area, however, the nearest recorded occurrence of glandular ditaxis is approximately 12 miles south of the Project Study Area and this species was not found during surveys for the Project. Therefore, this species is unlikely to occur within the Project locations.

California ditaxis (*Ditaxis serrata* var. *californica*) is a CNPS List 3.2 perennial herb belonging to the spurge family (Euphorbiaceae). It is historically known to occur in Sonoran desert scrub at elevations ranging from 100 to 3,300 feet (30 to 1,000 meters). This species' distribution is not well understood and most records within the NECO plan area are within, and immediately south of, Joshua Tree National Park (BLM 2002). Sonoran desert scrub occurs within the Project Study Area and there is a record of this species approximately three miles southwest of the Project Study Area.

During surveys, *two* individuals were found within the footprints of Alternative 1 and Alternative 3, respectively, and *604* individuals were found within the footprint of Alternative 2.

Spearleaf (*Matelea parvifolia*) is a CNPS List 2.3 perennial herb belonging to the milkweed family (Asclepidaceae). It is historically known to occur in Mojavean and Sonoran desert scrub at elevations ranging from 1,400 to 3,600 feet (440 to 1,095 meters). Although both Mojavean and Sonoran desert scrub occur within the Project Study Area, the highest elevation of the site is more than 500 feet below the lowest recorded elevation for spearleaf. Additionally, the nearest recorded occurrence is approximately 13 miles south of the Project Study Area. This species was also not found during surveys, and for these reasons this species is considered to be unlikely to occur within the Project locations.

Desert unicorn plant (*Proboscidea althaeifolia*) is a CNPS List 4.3 perennial herb belonging to the Unicorn-plant family (Martyniaceae). It is historically known to occur in sandy Sonoran desert scrub at elevations ranging from 500 to 3,300 feet (150 to 1,000 meters). This vegetation community occurs within the Project Study Area, and the species was observed during surveys. *One* individual *was* observed in the footprints of Alternative 1 and 3, and *none* were observed in the footprint of Alternatives 2.

Orocopia sage (*Salvia greatae*) is a CNPS List 1B.3 perennial evergreen shrub belonging to the mint family (Lamiaceae). It is historically known to occur in Mojavean and Sonoran desert scrub at elevations ranging from -130 to 2,700 feet (-40 to 825 meters). Both Mojavean and Sonoran desert scrubs occur within the Project Study Area, however, the nearest recorded occurrence of Orocopia sage is approximately nine miles south of the Project Study Area and this species was not found during surveys for the Project. Therefore, this species is considered to be unlikely to occur within the Project locations.

Desert spike-moss (*Selaginella eremophila*) is a CNPS List 2.2 perennial rhizomatous herb belonging to the Spike-moss family (Sellaginellaceae). It is historically known to occur in gravelly or rocky Sonoran desert scrub at elevations ranging from 650 to 3,000 feet (200 to 900 meters). The environmental conditions associated with occurrence of this species also are present within the Project Study Area; however, the nearest recorded occurrence of this species is approximately 13 miles south of the Project Study Area and this species was not found during surveys for the Project. Therefore, this species is considered to be unlikely to occur within the Project locations.

Cove's senna (*Senna covesii*) is a CNPS List 2.2 perennial herb belonging to the *pea* family. It is historically known to occur in sandy Sonoran desert scrub at elevations ranging from 1,000 to 3,500 feet (305 to 1,070 meters). There is a recorded occurrence of Cove's senna approximately five miles northwest of the Project Study Area. However, this species was not found during surveys, and suitable habitat and elevations are not present within the Project Study Area. For these reasons, this species is considered to be unlikely to occur within the Project locations.

Slender-spined allthorn (*Koeberlinia spinosa* ssp. *tenuispina*), also known as crown-of-thorns, is a CNPS List 2.2 deciduous shrub belonging to the althorn family (Koeberliniaceae). This species typically blooms from May to July. It is historically known to occur in rocky or gravelly soils in washes and ravines in desert dry wash woodlands and Sonoran desert scrub, at elevations ranging from 500 to 1,700 feet (150 to 510 meters). Slender-spined allthorn may form small colonies by root-sprouting.

Five individuals were found within SF-B and SF-C and, therefore, occur in the footprints of Alternatives 1, 2, and 3.

A number of species of cacti were found within the Project Study Area during floristic surveys and are listed in Table 3.3-3. Those species shown in bold are also considered special status plant species**.** Other non-special status cacti species were treated as special-status species for the purposes of this analysis due to BLM's salvage and translocation guidelines for cacti and yucca.

Table 3.3-3
Cacti Recorded Within the Project Study Area

Scientific Name	Common Name
Cactaceae	Cactus family
Coryphantha vivipara	Foxtail cactus
Echinocactus polycephalus	Cottontop
E. engelmannii	Hedgehog cactus
Ferocactus cylandraceus	Barrel cactus
Mammalaria tetrancistra	Fishhook cactus
Opuntia basilaris basilaris	Beavertail cactus
Opuntia echinocarpa	Golden cholla
Opuntia ramosissima	Pencil cholla
Simaroubaceae	Quassia or Simarouba family
Castela emoryi	Crucifixion thorn

Source: Ironwood 2010

3.3.6 Sensitive Natural Communities

Desert Dry Wash Woodland

The NECO Plan/EIS designates desert dry wash woodland habitats as a sensitive habitat subject to 3:1 mitigation for any disturbance within that habitat. Desert dry wash woodland (equivalent to Blue Palo Verde-Ironwood-Smoke Tree series vegetation in the more recent Sawyer-Keeler Wolf designations) is present within Alternatives 1, 2, and 3, as shown in (Figures 3.3-1 and 3.3-2). *In addition, desert dry wash woodland is present off-site, along episodic stream channels both upstream and downstream from project area boundaries, and in Pinto Wash, east of the Solar Farm layout alternatives.*

Active Desert Dunes

Active desert dunes are considered sensitive by the CNDDB and the BLM (within the NECO Plan/EIS) *and are the primary habitat type for certain special status plant and animal species. This community is characterized by mostly unvegetated drifted sand dunes and sand fields of five feet or less in height. Environmental changes that stabilize sand, affect sand sources, or block sand movement corridors also affect active dunes; as such, Sunlight commissioned an aeolian (wind driven) geomorphology study to determine whether the Solar Farm was within a sand transport corridor and to assess any potential impacts from aeolian sand migration within the proposed footprint of the solar farm facility (Kenney 2010).* Results of the aeolian geomorphology evaluation conducted for the proposed Project showed that there is no evidence of aeolian sand migration (no active dune fields) within the Solar Farm area (Kenney 2010); *thus, the Project would not have any significant effect on aeolian sand migration. Additionally, no active dune fields were identified within the Project locations during surveys. Within the Project Study Area, aeolian sand deposits are limited to the eastern portion of the Project Study Area located approximately one mile east of the Solar Farm alternatives. Because other portions of the*

Project locations (substations and gen-tie lines) are not located adjacent to active dunes, they are not expected to affect sand transport to active dunes and were not included in this study.

Fine Sand Habitats

According to the aeolian geomorphology study (Kenney 2010), relict aeolian deposits exist within the Solar Farm site (layouts B and C). These deposits, which by definition are no longer receiving active sand transport, consist of sand sheets and small coppice dunes (i.e., mounds at the base of plants). The sand sheets are stabilized with vegetation and often exhibit a wind abrasion lag on the surface composed of very coarse sand and small gravel. The relict coppice dunes (mounds at the base of plants) were observed to be strongly degraded via bioturbation and other processes. These types of dune deposits are known for zones characterized by relatively minor aeolian sand migrating fluxes and likely were deposited in the mid to late Holocene (past 5,000 years).

Relict sand deposits in coppice dunes and sand sheets, both overlying bajada surfaces, are generally only a few centimeters thick, overlying hardened alluvial surfaces. The sand surfaces are also hardened and thus no longer accessible to aeolian transport. These relict sands are not suitable habitat for special status plant species restricted to dunes or other aeolian habitats.

The only aeolian deposits identified within the Solar Farm alternatives that receive active sand transport consist of moderately active coppice dunes within some of the active alluvial washes. These deposits are likely associated with minor aeolian sand fluxes derived from the local washes within a few months after they flow. Sand deposits within the washes are thin (only a few centimeters deep), overlying more coarsely armored rock and gravel channel bottoms. Most sand within the washes is coarser than aeolian dune sand. These washes and the small patches of adjacent coppice dune habitat are poorly to marginally suitable habitat for special status plant species restricted to dunes or other aeolian habitats.

Based on the evidence evaluated during this study, aeolian sand transport across the site is very low to low. Winds appear to be sufficiently strong across the site to entrain and transport sand; however, there is a paucity of sand source(s) to support more than low to very low sand transport; most of the potentially available sand is from the local active washes and this sand quickly deposits within local coppice dunes within or in the proximity of the washes from which the sand derived.

According to the Biological Resources Technical Report (Ironwood, 2010), sand dunes within the Project Study Area are limited to an area located one mile east of the Sunlight and SCE components (including Solar Farm layouts B and C, gen-tie lines, and substation alternatives).

3.3.7 Jurisdictional Resources

The Project Study Area is not within a floodplain, as defined by the Federal Emergency Management Agency (FEMA). Nevertheless, several ephemeral washes are present that may fall under the jurisdiction of various agencies, such as the USACE, CDFG, and RWQCB and *could* thus be described as jurisdictional waters *if certain regulatory criteria are met*. During project surveys, no areas were found that met the USACE technical criteria for classification as wetlands. However, a number of areas did meet the USACE technical criteria for other waters of the U.S. due to the presence of an ordinary high water mark. These areas are locally known as desert dry washes. While these areas meet the criteria for other waters of the U.S., they are not subject to USACE jurisdiction under the Clean Water Act. This is based on guidance provided by the EPA and USACE and is due to their lack of a surface water connection to the following: a traditional navigable waterway, an intrastate commerce connection with the ephemeral surface water flows, and ponding that infrequently occurs in localized areas within the desert dry washes within the proposed Solar Farm site (Ironwood 2010).

The Applicant has requested *and received an official USACE determination that there are no waters of the United States within the Project area.* However, ephemeral desert washes within the Project *area* do fall under the jurisdiction of the CDFG's Streambed Alteration Agreement Program.

3.4 WILDLIFE

3.4.1 Applicable Plans, Policies, and Regulations

Federal Regulations

Endangered Species Act of 1973

The ESA (16 U S C *§§ 1531-1544*) and subsequent amendments establish legal requirements for the conservation of endangered and threatened species and the ecosystems upon which they depend.

Section 7

Section 7 of the ESA requires federal agencies, in consultation with, and with the assistance of the Secretary of the Interior or the Secretary of Commerce, as appropriate, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification of critical habitat for these species. The USFWS and National Marine Fisheries Service share responsibilities for administering the Act. All federal threatened and endangered species considered in this EIS are under the jurisdiction of the USFWS. Regulations governing interagency cooperation under Section 7 are found at 50 CFR, Part 402. The BO issued at the conclusion of formal Section 7 consultation may include a statement authorizing a take that may occur incidental to an otherwise legal activity.

> *Critical Habitat*
>
> *Critical habitat is defined as: (1) specific areas within the geographical area occupied by the species at the time of listing, if they contain physical or biological features essential to conservation, and those features may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation. Designation of an area as critical habitat provides a means by which the habitat of an endangered or threatened species can be protected from adverse changes or destruction resulting from federal activities or projects. A critical habitat designation does not set up a preserve or refuge and usually applies only when federal funding, permits, or projects are involved, though it may be protected under CEQA. Critical habitat requirements do not apply to citizens engaged in activities on private land that do not involve a federal agency.*

Section 9

Section 9 of the ESA lists those actions that are prohibited under the ESA, including take (i.e., to harass, harm, pursue, hunt, wound, or kill) of listed species of fish and wildlife without special exemption. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or shelter. "Harass" is further defined as actions that create the likelihood of injury to listed species to an extent as *to* significantly disrupt normal behavior patterns which include breeding, feeding, and shelter.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (16 USC 703-711) is a treaty signed by the United States, Canada, Mexico, and Japan that makes it unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, or kill migratory birds. The law applies to the removal of nests (such as swallow nests on bridges) occupied by migratory birds during the breeding season. The MBTA

states that it is unlawful to take these species, their nests, their eggs, or their young anywhere in the United States.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act of 1940 (16 USC, 668, enacted by 54 Stat. 250) protects bald and golden eagles by prohibiting the taking, possession, and commerce of such birds and establishes civil penalties for violation of this act. Under the Bald and Golden Eagle Protection Act, take includes "disturb," which means "to agitate or bother a bald eagle or a golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (16 USC, 661-666) applies to any federal project where the waters of any stream or other body of water are impounded, diverted, deepened, or otherwise modified. Project proponents are required to consult with the USFWS and the appropriate state wildlife agency. These agencies prepare reports and recommendations that document project effects on wildlife and identify measures that may be adopted to prevent loss or damage to wildlife resources. The term "wildlife" includes both animals and plants. Provisions of the act are implemented through the NEPA process and the Section 404 permit process.

Desert Tortoise Recovery Plan and Critical Habitat Designation of 1994

The Desert Tortoise Recovery Plan established a strategy for the recovery and eventual delisting of the Mojave population of desert tortoise. Six recovery units within 14 Desert Wildlife Management Areas (DWMAs) were originally proposed in Arizona, California, Nevada, and Utah. Based on information in the Recovery Plan, 12 Critical Habitat Units (CHUs) were established for the Mojave population of desert tortoise by the USFWS on February 8, 1994.

A draft revised recovery plan was prepared in 2008 (USFWS 2008), which re-delineated the recovery units and reduced them from six units to five units, based on recent genetic research. The recovery units cover the entire range of the Mojave population (all tortoises north and west of the Colorado River) of desert tortoise.

California Desert Protection Act of 1994

This act established the Death Valley and Joshua Tree National Parks, the Mojave National Preserve, and the Granite Mountains National Reserve. It also declared certain lands in the California desert as wilderness, and included other natural resource designations and provisions.

Executive Order 13112 Invasive Species

This order directs federal agencies to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause. To do this, the order established the National Invasive Species Council; currently there are 13 Departments and Agencies on the Council.

State Laws and Regulations

California Environmental Quality Act

The California Environmental Quality Act (CEQA) (PRC. 21000 et seq.) was enacted in 1970 to provide for full disclosure of environmental impacts to the public before issuance of a permit by state and local public agencies. With regard to biological resources, CEQA gives consideration to "sensitive" plants and animals, in addition to federal or state listed species. Sensitive species include wildlife Species of Special Concern listed by the CDFG and BLM sensitive species*, and species which meet the CEQA definition of endangered, rare or threatened. (CEQA Guidelines §15380.)*

California Endangered Species Act

The CESA (Fish and Game Code 2050 et seq.) establishes the policy of the state to conserve, protect, restore, and enhance threatened or endangered species and their habitats. CESA mandates that state agencies should not approve projects that would jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. There are no state agency consultation procedures under CESA. For projects that affect a species listed under both CESA and the federal ESA, compliance with the federal ESA will satisfy CESA if the CDFG determines that the federal incidental take authorization is consistent with CESA under Fish and Game Code Section 2080.1. For projects that will result in a take of a state-only listed species, the applicant must apply for a take permit under Section 2081(b).

California Fish and Game Code, Sections 3511, 4700, 5515, and 5050

The classification of fully protected species was the state's initial effort to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish, amphibians and reptiles, birds and mammals. Most of the species on these lists have subsequently been listed under the state or federal endangered species acts, or both, although there are several exceptions, including the golden eagle.

The Fish and Game Code sections dealing with fully protected species state that these species "...may not be taken or possessed at any time and no provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected" species, although take may be authorized for necessary scientific research. This language arguably makes the "fully protected" designation the strongest and most restrictive regarding the "take" of these species. In 2003, the code sections dealing with fully protected species were amended to allow the CDFG to authorize take resulting from recovery activities for state-listed species.

California Fish and Game Code, Sections 3503 and 3513

Section 3503 prohibits the taking and possession of any bird egg or nest, except as otherwise provided by this code or subsequent regulations. Further, Section 3513 provides for the adoption of the MBTA's provisions. As with the MBTA, this state code offers no statutory or regulatory mechanism for obtaining an incidental take permit for the loss of non-game migratory birds. The administering agency for these sections is the CDFG.

Bureau of Land Management Plans and Guidelines

California Desert Conservation Area Plan

The CDCA is a 25-million acre expanse of land in southern California designated by Congress in 1976 through the FLPMA. BLM administers about 10 million of those acres. When Congress created the CDCA, it recognized its special values, proximity to the population centers of southern California, and the need for a comprehensive plan for managing the area. Congress stated that the CDCA Plan must be based on the concepts of multiple use, sustained yield, and maintenance of environmental quality. The proposed Project falls within the CDCA.

The Wildlife Element of the CDCA Plan contains objectives and goals designed to: manage federally and State listed species and their habitats; comply with existing legislation and BLM policies; provide certain species designated as sensitive by the BLM special consideration and attention in the planning process; consider the habitat of all fish and wildlife in implementing the CDCA Plan; manage representative habitats using a holistic approach; give habitats unique to the CDCA special management consideration and manage them so as to maintain their unique biological characteristics; and manage sensitive habitat using a holistic, systems-type approach. Some examples of sensitive habitats include: riparian areas, wetlands, sand dunes, relict and island habitats, washes, and important ecological zones between different major ecosystems and deserts.

The primary active wildlife management tools used in the CDCA Plan are Areas of Critical Environmental Concern (ACECs) and Habitat Management Plans (HMPs). The CDCA Plan also affords protection to fish and wildlife resources through the designation of Multiple-Use Class L, which limits the number and location of routes that are approved. In addition, the plan includes a designation of Special Areas that highlights habitats and species that should receive special consideration in the environmental assessment process for all project types. Two additional designations in the Wildlife Element are Research Natural Area and Sikes Act Agreement. Research Natural Areas have been proposed in a few locations where research and education would be the primary uses. Sikes Act Agreements are cooperative agreements between the BLM and the CDFG for joint development and implementation of an HMP. The plan identified 89 special fish and wildlife areas that would receive active habitat management and/or special attention in the environmental assessment process. Twenty-eight areas were identified as ACECs solely or partially to protect fish and wildlife resources.

Northern and Eastern Colorado Desert Coordinated Management Plan/EIS

The NECO Plan/EIS is a landscape-scale, multi-agency planning effort that seeks to protect and conserve natural resources while simultaneously balancing human uses of the California portion of the Sonoran Desert ecosystem. The NECO planning area, which is located in the southeastern CDCA, encompasses over 5 million acres and hosts 60 sensitive plant and animal species. The NECO Plan/EIS amends BLM's CDCA Plan. This multiple use planning effort also takes into account other uses of the desert, such as hiking, hunting, rock hounding, off-highway recreation, commercial mining, livestock grazing, and utility transmission.

The NECO Plan/EIS provides reserve management for the desert tortoise, integrated ecosystem management for special status species and natural communities for all federal lands, and regional standards for public land health for BLM lands. The NECO Plan focuses on the conservation of species and habitats through the use of a system of large *Desert Wildlife Management Areas (*DWMAs*)*

for the desert tortoise and wildlife habitat management areas (WHMAs) for other special status species and natural communities. DWMAs and WHMAs would replace all current special designations for species and habitats. DWMAs generally coincide with current tortoise critical habitat areas, are ACECs, and feature a one percent surface disturbance limit. The focus of WHMAs is on mitigation, habitat improvements, and federal ownership. The NECO Plan/EIS also addresses designation of routes of travel, land ownership pattern, access to resources for economic/social needs, bighorn sheep management, and burro and wild horse management.

Regional and Local Regulations

County of Riverside General Plan

The following open space policies relevant to wildlife are defined in the Desert Center Area Plan (DCAP) within the Riverside County General Plan as follows:

DCAP 10.1 Encourage clustering of development for the preservation of contiguous open space.

DCAP 10.2 Work to limit off-road vehicle use within the Desert Center Area Plan.

DCAP 10.3 Require new development to conform with Desert Tortoise Critical Habitat designation requirements.

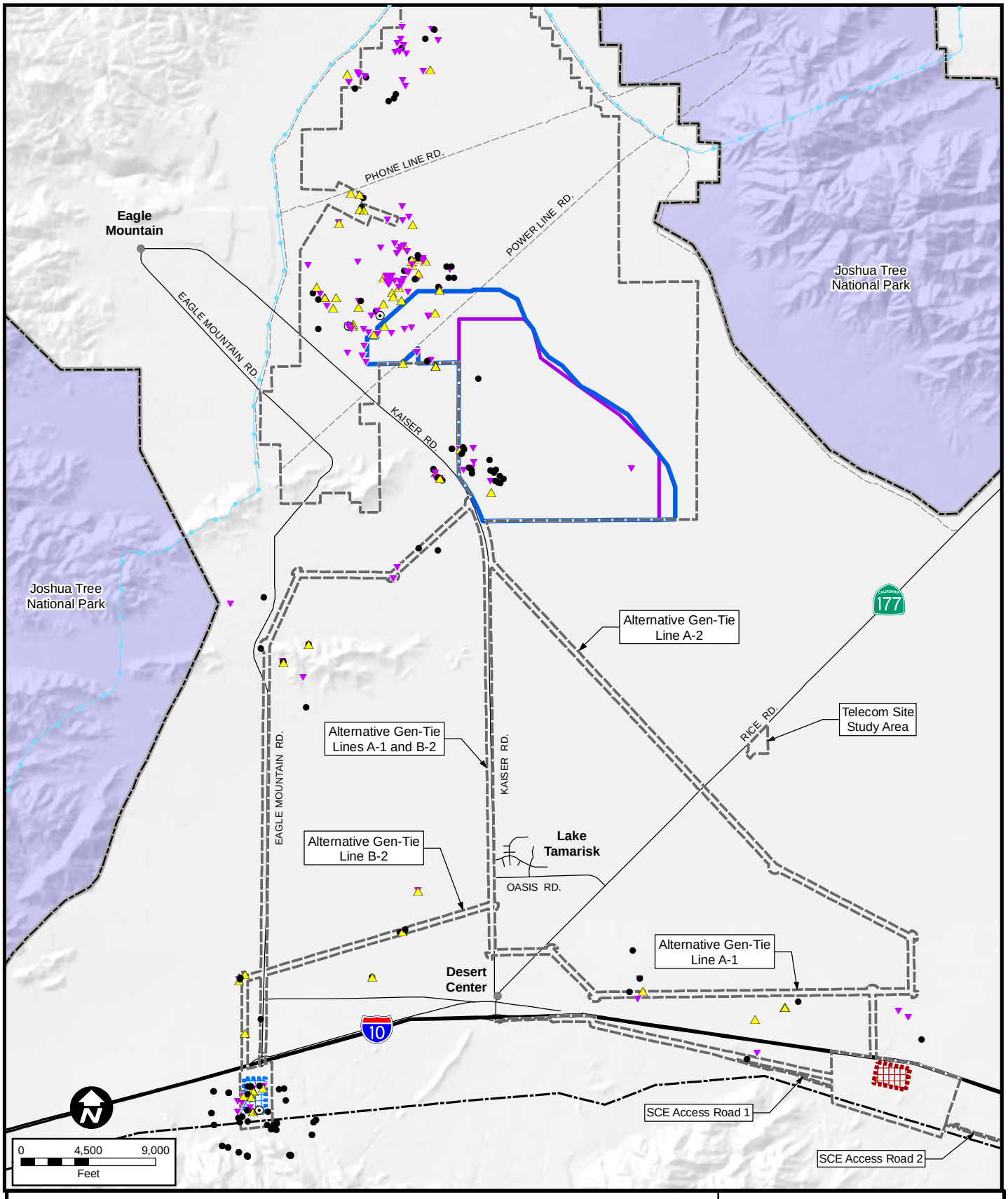
3.4.2 Methodology

The Project Study Area encompasses approximately 19,516 acres that were originally considered for siting of the Project components. Initial surveys for biological resources were conducted within this larger Project Study Area, which, along with locations of each alternative, are shown in Figures 3.4-1 through 3.4-5. Additional acreage was added to the Project Study Area to accommodate changes to the footprint of various project components, including the eastern substation (Red Bluff Substation A) and associated Gen-Tie Lines (GT-A-1 and GT-A-2). *Thus, appropriate biological resource surveys included all sites for the proposed Project facilities and associated Project components for the proposed Project and each alternative. In addition to biological resource surveys all sites with potential for active or partially stabilized sand dunes were also covered by an aeolian geomorphology evaluation. (Solar Farm site layouts B and C). Field surveys covering all project component sites provide the appropriate biological data to support the analysis and conclusions presented here.*

Prior to conducting any biological surveys, a biological resources literature search was performed. This included researching information from regional documents such as the NECO Plan/EIS (BLM and CDFG 2002), the Biological Opinion (BO) for the NECO Plan/EIS (USFWS 2005), and line distance sampling data for desert tortoise collected between 2001 and 2009 in the region. Searches of the CDFG's California Natural Diversity Database were conducted to determine the sensitive species that have been documented in the proposed project vicinity. These searches included a radius of five miles surrounding the Project Study Area.

In addition, surveyors reviewed environmental documents for nearby proposed renewable energy projects that included extensive biological surveys, including the Palen Solar Power Project (BLM and CEC 2010) and the Genesis Solar Energy Project (Genesis Solar 2009), whose sites are approximately 10 miles (Palen) and 17 miles (Genesis) southeast of the Project Study Area. These

X:\GIS\Desert_Sunlight\MXD_Files\Tortoise_Prj.mxd



LEGEND

Source: Ironwood Consulting, Inc. 2010

Tortoise Sign
- Tortoise
- Burrow/Pallet
- Mating Ring
- Scat

Desert Sunlight Study Area Boundary

Solar Farm Boundary (Alternative B)

Solar Farm Boundary (Alternative C)

Red Bluff Substation (Alternative A)

Red Bluff Substation (Alternative B)

Joshua Tree National Park Boundary

Aqueduct

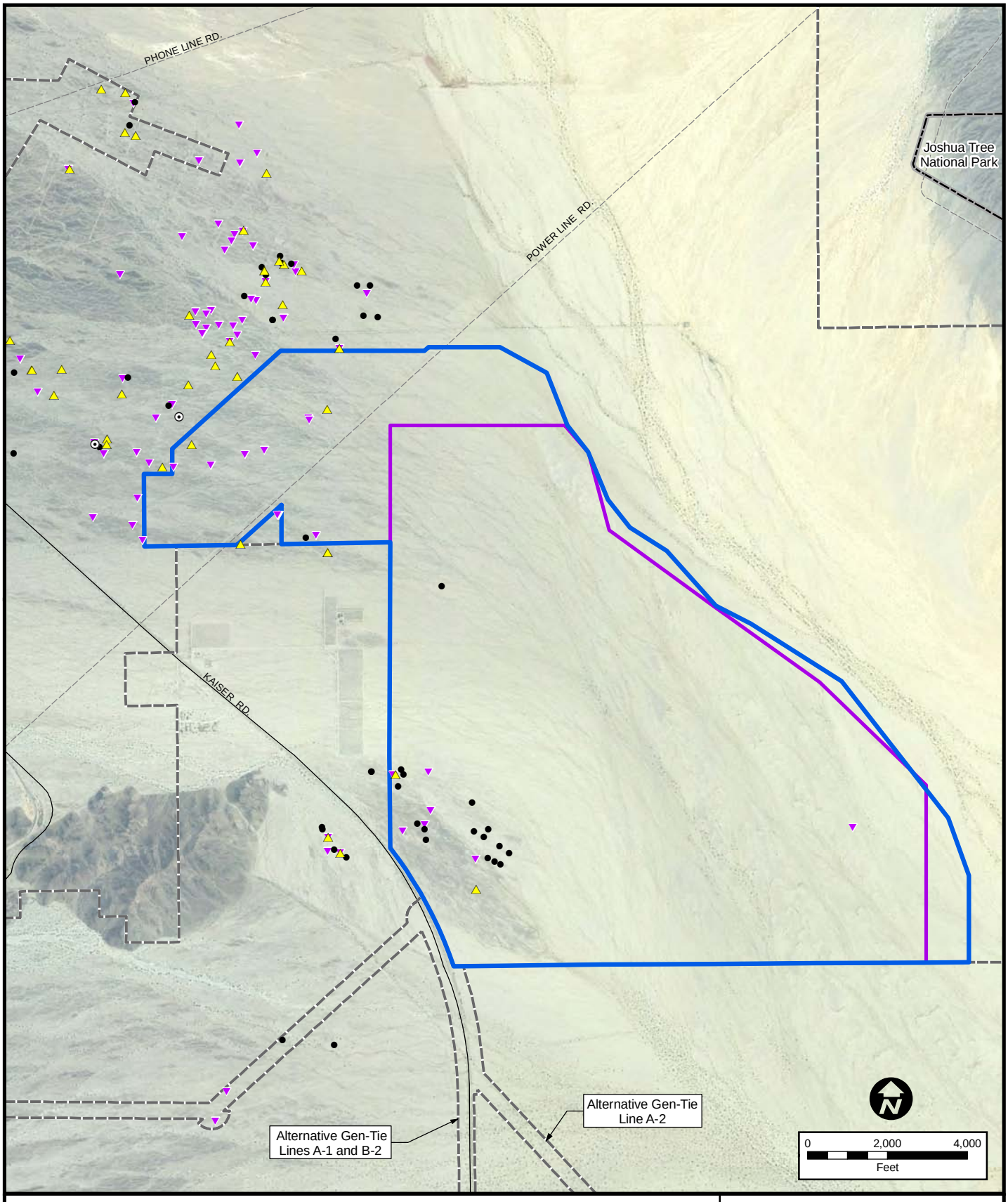
Devers-Palo Verde Transmission Line (DPV1)

DESERT SUNLIGHT SOLAR FARM

Figure 3.4-1

Active Desert Tortoise Sign for Proposed Project and Alternatives

X:\GIS\Desert_Sunlight\MXD_Files\Tortoise.mxd



LEGEND

Tortoise Sign
- Tortoise
- Burrow/Pallet
- Mating Ring
- Scat

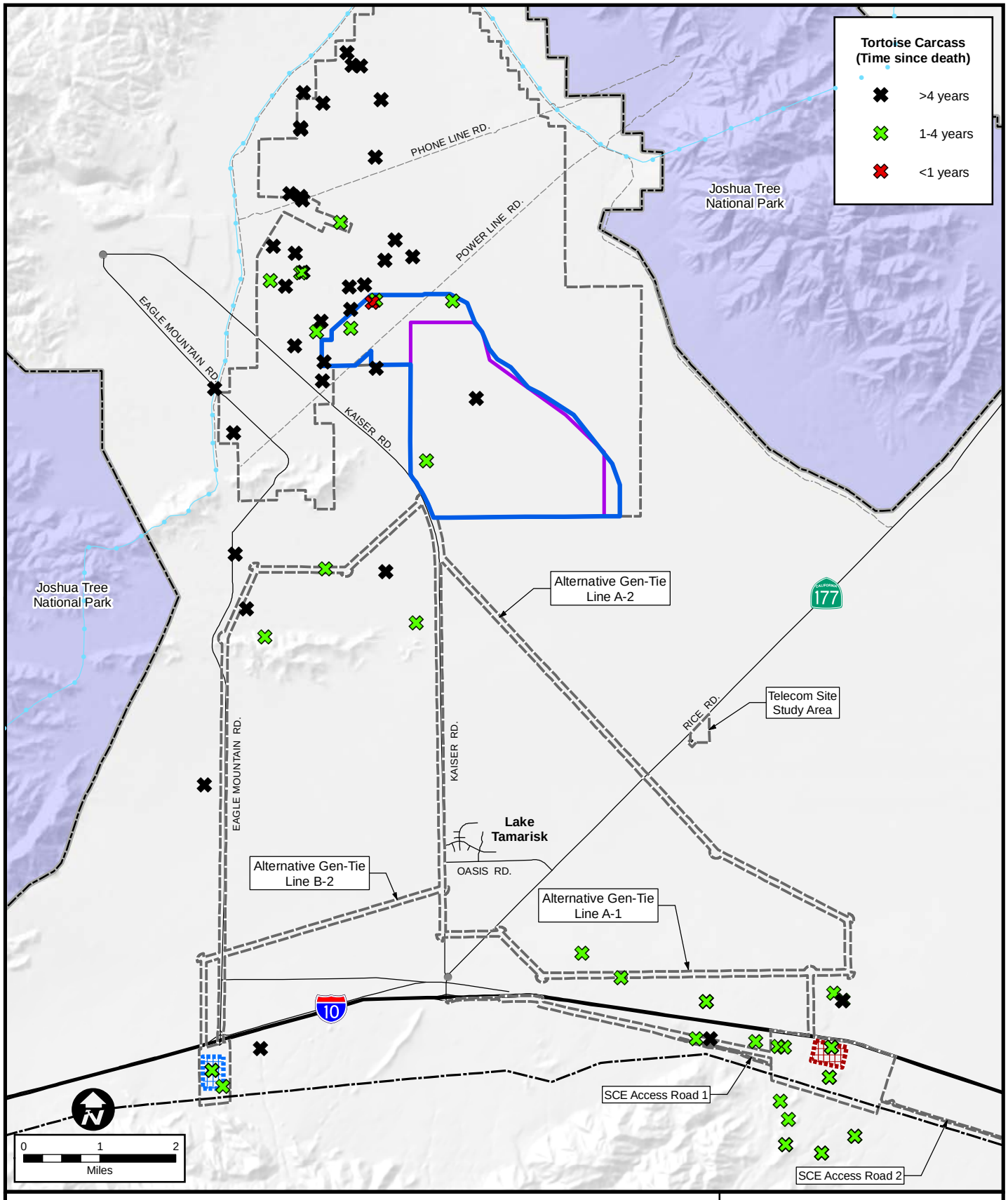
- Desert Sunlight Study Area Boundary
- Solar Farm Boundary (Alternative B)
- Solar Farm Boundary (Alternative C)
- Aqueduct

Source: Ironwood Consulting, Inc. 2010

DESERT SUNLIGHT SOLAR FARM

Figure 3.4-2

Active Desert Tortoise Sign (Solar Farm Site)



LEGEND

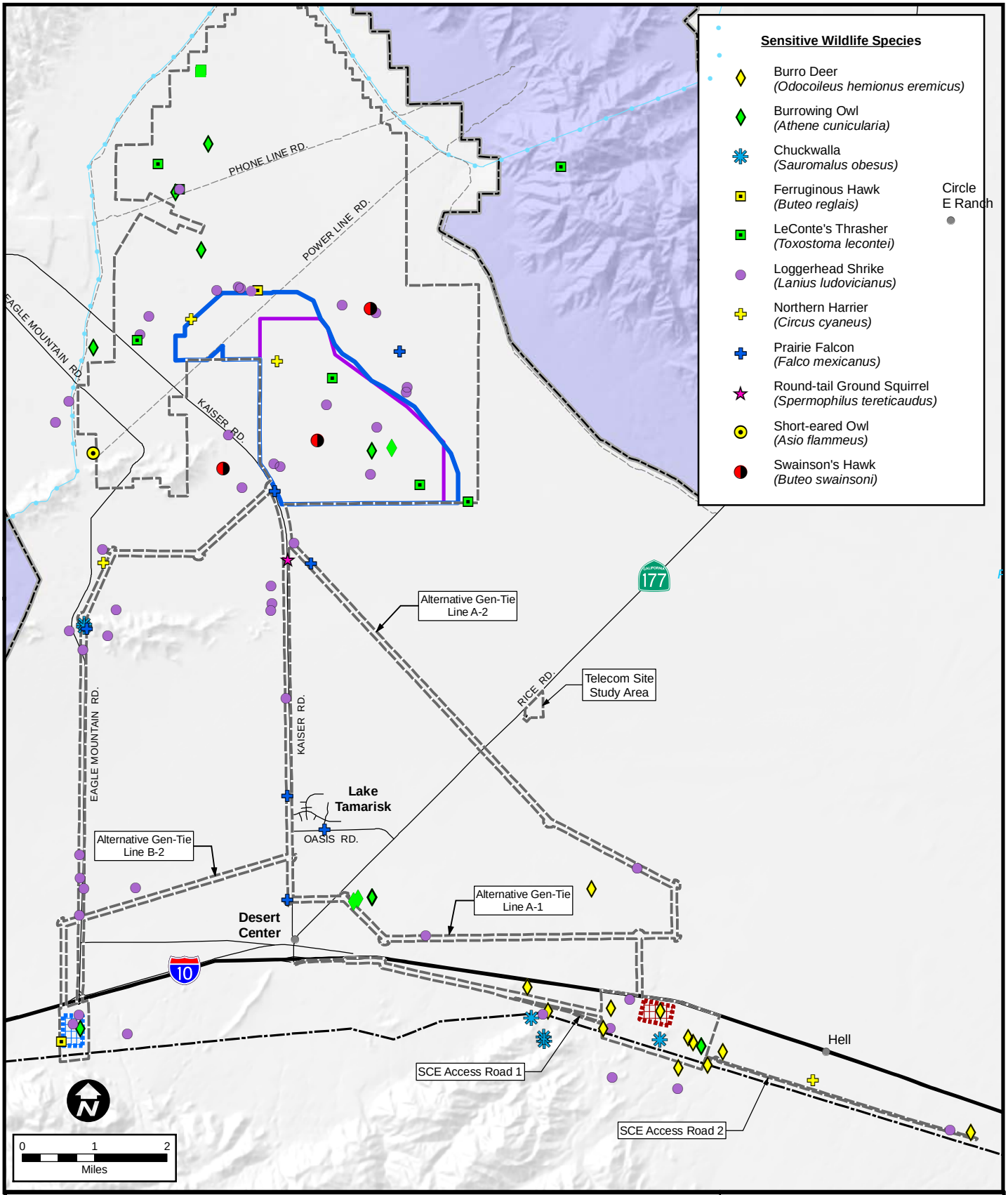
- Desert Sunlight Study Area Boundary
- Solar Farm Boundary (Alternative B)
- Solar Farm Boundary (Alternative C)
- Red Bluff Substation (Alternative A)
- Red Bluff Substation (Alternative B)
- Devers-Palo Verde Transmission Line (DPV1)
- Aqueduct

Source: Ironwood Consulting, Inc. 2010

DESERT SUNLIGHT SOLAR FARM

Figure 3.4-3

Desert Tortoise Carcass



LEGEND

- Desert Sunlight Study Area Boundary
- Solar Farm Boundary (Alternative B)
- Solar Farm Boundary (Alternative C)
- Devers-Palo Verde Transmission Line (DPV1)
- Red Bluff Substation (Alternative B)
- Red Bluff Substation (Alternative A)
- Joshua Tree National Park Boundary
- Aqueduct

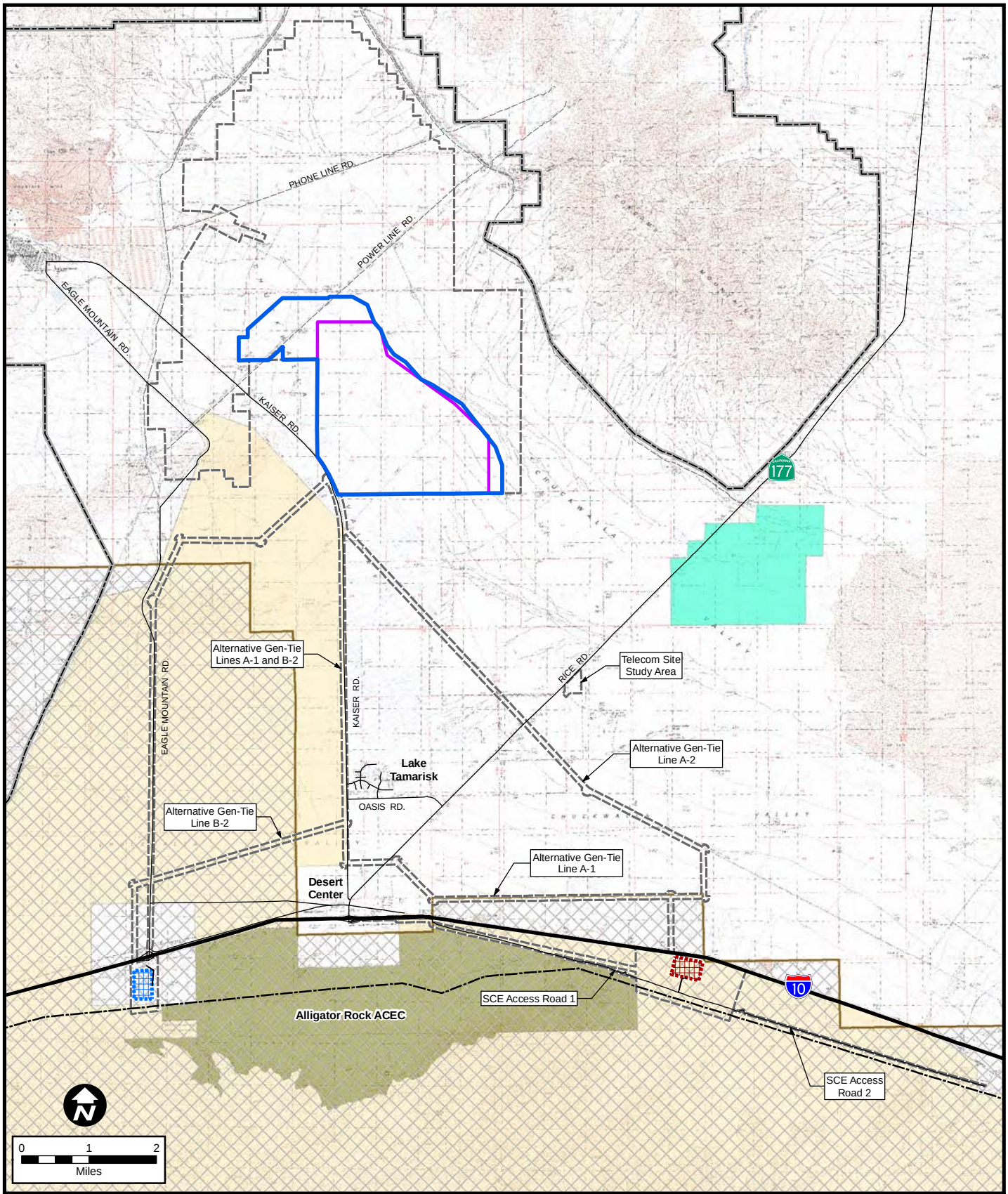
Source: Ironwood Consulting, Inc. 2010

DESERT SUNLIGHT SOLAR FARM

Figure 3.4-4

Sensitive Wildlife Species

X:\GIS\Desert_Sunlight\MXD_Files\Fed_Land.mxd



LEGEND

- Alligator Rock ACEC
- Chuckwalla DWMA
- Desert Lily Preserve ACEC
- Desert Tortoise Critical Habitat
- Joshua Tree National Park Boundary
- Desert Sunlight Study Area Boundary
- Solar Farm Boundary (Alternative B)
- Solar Farm Alternative C
- Red Bluff Substation (Alternative A)
- Red Bluff Substation (Alternative B)
- Devers-Palo Verde Transmission Line (DPV1)

Sources: BLM, 2010.
USFWS Critical Habitat Portal.

DESERT SUNLIGHT SOLAR FARM

Figure 3.4-5

Federal Land Designation

reports were reviewed to determine whether any sensitive species found during surveys of those project sites might be relevant to this proposed Project. Literature reviews were augmented by the professional judgment of qualified biologists before surveys were made.

Using this information and observations in the field, a list was generated of special status wildlife species that have the potential to occur within the Project Study Area. For assessment purposes, special status species were defined as wildlife that:

- Have been designated as either rare, threatened, or endangered by CDFG or the USFWS, and are protected under either the ESA or CESA;
- Are proposed or candidate species for listing under those same acts;
- Meet the definition of endangered, rare, or threatened under CEQA Guidelines Section 15380; or
- Are considered special status species in local or regional plans, policies, or regulations, such as the NECO Plan/EIS.

A description of each of these types of special status wildlife species is presented in Table 3.4-1.

Table 3.4-1
Definitions of Special Status Wildlife Species Under Consideration in This EIS

Species Designation	Agency	Definition
Endangered	USFWS	A species that is in danger of extinction throughout all or a significant portion of its range.
Threatened	USFWS	Any species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.
Proposed	USFWS	A species for which the USFWS has sufficient information on its biological status and threats to propose it as endangered or threatened under the ESA.
Candidate	USFWS	A species for which the USFWS has sufficient information on its biological status and threats to propose it as endangered or threatened under the ESA, but for which development of a proposed listing regulation is precluded by other higher priority listing activities. USFWS candidate species are given no extra legal protection under federal laws.
Protected under the federal Migratory Bird Treaty Act (MBTA)	USFWS	All native bird species in the US.
Covered under the NECO Plan/EIS	BLM	Special status species that were addressed in the NECO Plan/EIS, due to management concerns within the NECO planning area.
Sensitive	BLM	Those species (1) that are under status review by the US Fish and Wildlife Service or National Marine Fisheries Service, (2) whose numbers are declining so rapidly that federal listing may become necessary, (3) those with typically small and widely dispersed populations, or (4) those inhabiting ecological refugia or other specialized or unique habitats.
Endangered	CDFG	A native species or subspecies that is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease.

Table 3.4-1 (continued)
Definitions of Special Status Wildlife Species Under Consideration in This EIS

Species Designation	Agency	Definition
Threatened	CDFG	A native species or subspecies that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of special protection and management efforts.
Candidate	CDFG	A native species that has been officially noticed by the California Fish and Game Commission as being under CDFG review for addition to the threatened or endangered species lists. CDFG candidate species are given no extra legal protection under state laws.
Fully Protected (FP)	CDFG	Species that are a result of California's initial effort in the 1960s to identify and provide additional protection to those animals that were rare or that faced possible extinction. Most fully protected species have also been listed as threatened or endangered under the more recent endangered species laws and regulations.
Species of Special Concern (SSC)	CDFG	A species, subspecies, or distinct population of an animal native to California that currently satisfies one or more of the following (not necessarily mutually exclusive) criteria: • Is extirpated from the state or, in the case of birds, in its primary seasonal or breeding role; • Is listed as federally but not state threatened or endangered; • Meets the state definition of threatened or endangered but has not formally been listed; • Is experiencing or formerly experienced serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for state threatened or endangered status; or • Has naturally small populations exhibiting high susceptibility to risk from any factor(s), that if realized, could lead to declines that would qualify it for state threatened or endangered status. SSC is an administrative designation and carries no formal legal status. This designation is intended to focus attention on animals at conservation risk, to stimulate research on poorly known species, and to achieve conservation and recovery before these species meet the CESA criteria for listing. California SSC are considered under CEQA and require a discussion of impacts and appropriate mitigation to reduce impacts.
California Fish and Game Code 3503 and 3513	CDFG	All US native bird species that occur in California.

Preliminary biological resources surveys were conducted within the Project Study Area in 2007. The purpose of the surveys was to provide preliminary habitat descriptions within the Project Study Area, describe the need for focused surveys for special status species, and summarize potential biological constraints for the proposed project. The size of the Project Study Area and the description of the proposed solar facility have changed since the 2007 surveys. The current Project locations and Project Study Area are shown in Figures 3.4-1 through 3.4-5. A subsequent BRTR

(Appendix H) incorporates the results of the 2007 surveys, as well as all subsequent surveys, into the characterization of the biological resources of the current Project locations. The discussion of the existing biological setting is based upon information in the Biological Resources Technical Report (Ironwood Consulting 2010a). Focused desert tortoise surveys were conducted in 2008 and 2009 to determine the presence or absence of desert tortoise and other special status species within the Project Study Area and in the immediately surrounding areas, and to estimate the number of individuals of each species that could be present within the Project locations during construction. *One portion of the Red Bluff Substation A location was originally surveyed outside the USFWS recommended survey period (Appendix H) but that area was resurveyed in October 2010 within the recommended period (Biological Assessment Fig. 9).* In addition to recording desert tortoise information, surveyors recorded all wildlife species, including special status *species, which* were encountered during the survey. In addition, in 2009, surveys were conducted to determine the locations of desert dry wash woodland within the Project Study Area. Additional surveys for desert tortoise and special status wildlife were conducted in 2010 to encompass new project alternative areas.

Golden eagle surveys were conducted by Wildlife Research Institute, Inc. (WRI) for four proposed energy development projects. The study area was 1,600 square miles in the Big Maria, Chuckwalla, Coxcomb, Eagle, Hodges, Little Chuckwalla, Little Maria, McCoy, Orocopia and Palen mountain ranges, as well as the Chuckwalla Valley. Phase 1 and Phase 2 surveys for golden eagles were conducted within 10 miles of project boundaries in order to comply with the USFWS *Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols; and Other Recommendations in Support of Golden Eagle Management and Permit Issuance* (Pagel et al. 2010). Surveys were conducted by helicopter to confirm golden eagle activity, occupancy, breeding status of the pairs, and fledging success. Additionally, barn owl, bighorn sheep, common raven, Cooper's hawk, great horned owl, long-eared owl, prairie falcon, red-tailed hawk, Swainson's hawk, and turkey vulture were recorded with GPS locations. The results of the surveys relevant to the proposed Project are summarized in the BRTR contained in Appendix H.

Phase 1 and 2 burrowing owl surveys were conducted following the California Burrowing Owl Consortium's *Burrowing Owl Survey Protocol and Mitigation Guidelines* (California Burrowing Owl Consortium 1993).

Bird counts were also conducted between April 7 and 17, 2010. Birds were sampled using the point count method described in *Monitoring Bird Populations by Point Counts* (Ralph et al. 1995).

A small mammal trapping survey was completed and a bat assessment was conducted in February 2010 to assess potential habitat for special status bat species within the Project locations.

Certain special status wildlife species are restricted to active dunes. As described in Section 3.3, Vegetation, the Applicant conducted an aeolian geomorphology evaluation to assess the potential impacts, if any, on aeolian (wind driven) sand migration within the proposed footprint of the Solar Farm.

In summary, at a minimum, all but one Project facility and associated Project components for the proposed and alternative Project features were surveyed for biological resources. The exception was the aeolian geomorphology evaluation, which covered only the Solar Farm site. Data collected during surveys adequately documents the baseline conditions for biological resources.

3.4.3 General Wildlife

Below is a description of the common (non-special status) wildlife species that either have been observed or are expected to occur in the vegetation communities found within the Project locations and are described in Section 3.3.3.

Creosote Bush – White Bursage Series

Desert reptile species observed within the creosote bush-white bursage community during surveys include desert horned lizard (*Phrynosoma platyrhinos*), long-nosed leopard lizard (*Gambelia wislizenii*), zebra-tailed lizard (*Callisaurus draconoides*), side-blotched lizard (*Uta stansburiana*), desert iguana (*Dipsosaurus dorsalis*), coachwhip (*Masticophis flagellum*), sidewinder (*Crotalus cerastes*), speckled rattlesnake (*C. mitchelli*), and western whiptail (*Cnemidophorus tigris*).

Bird species observed in this habitat type during surveys include turkey vulture (*Cathartes aura*), horned lark (*Eremophila alpestris*), black-throated sparrow (*Amphispiza bilineata*), Gambel's quail (*Callipepla gambelii*), California quail (*C. californica*), and common raven (*Corvus corax*).

Mammal species observed in desert scrub habitat during surveys include coyote (*Canis latrans*), bobcat (*Lynx rufus*), black-tailed jackrabbit (*Lepus californicus*), white-tailed antelope ground squirrel (*Ammospermophilus leucurus*), and desert cottontail (*Sylvilagus audubonii*). Small mammals detected during small mammal trapping were the long-tailed pocket mouse (*Chaetodipus formosus*), Merriam's kangaroo rat (*Dipodomys merriami*), spiny pocket mouse (*Perognathus spinatus*), little pocket mouse (*P. longimembris*), and desert woodrat (*Neotoma lepida*).

Blue Palo Verde – Ironwood – Smoke Tree Series (Desert Dry Wash Woodland)

The desert dry wash woodland would be expected to support common bird species characteristic of the surrounding desert habitats as well as birds that prefer woodlands. Representative species include blue-gray gnatcatcher (*Polioptila caerulea*), mourning dove (*Zenaida macroura*), and white-crowned sparrow (*Zonotrichia leucophrys*). Desert dry wash woodlands are particularly important as stopover feeding habitat for many migratory bird species, due to the very high insect productivity in these habitats.

Reptiles expected in this community include western whiptail. Amphibians that are typically associated with desert wash areas include western spadefoot toad (*Spea hammondii*) and Couch's spadefoot toad (*Scaphiopus couchi*).

Desert dry wash woodland attracts foraging bats, such as pallid bats (*Antrozous pallidus*) and California myotis (*Myotis californicus*), due to increased insect concentration. Hoary bats (*Lasiurus cinereus*) will roost in palo verde and ironwood trees. Large mammal species can use desert dry washes and include special status species such as bighorn sheep (*Ovis canadensis*) and burro deer (*Odocoileus hemionus eremicus*). While sign for burro deer was observed during surveys, bighorn sheep, including tracks and scat, were not observed. Small mammals detected during small mammal trapping were long-tailed pocket mouse (*Chaetodipus formosus*), Merriam's kangaroo rat (*Dipodomys merriami*), spiny pocket mouse (*Perognathus spinatus*), little pocket mouse (*P. longimembris*), and desert woodrat (*Neotoma lepida*).

Disturbed Areas

Disturbed, ruderal, and non-vegetated areas are found in association with roads within the Project locations and previously developed areas around wells and associated features such as drainage basins. Disturbed areas are found on 2 acres of GT-A-1, 20 acres of GT-A-2, 2 acres of GT-B-2, and 1 acre of Red Bluff Substation A (Access Road 1).

Developed and disturbed areas provide habitat for opportunistic wildlife species. House sparrows (*Passer domesticus*) often nest on artificial structures. Red-tailed hawks (*Buteo jamaicensis*) and common ravens frequently nest on the steel lattice towers of transmission lines. Coyotes may also be present.

3.4.4 Special Status Wildlife Species

Special status wildlife species that could occur within the Project Study Area are shown in Table 3.4-2. As described in more detail below, these wildlife vary in their probability of occurrence within the Project Study Area.

Table 3.4-2
Special Status Wildlife Species with the Potential to Occur in the Project Study Area

Scientific Name **Common Name**	**Status**	**Potential for Occurrence Alternative 1/ Alternative 2/ Alternative 3[1]**
Amphibians		
Scaphiopus couchi Couch's spadefoot	Federal: None State: SSC BLM: Covered under NECO Plan, Sensitive	U/U/U
Reptiles		
Gopherus agassizii Desert tortoise	Federal: Threatened State: Threatened BLM: Covered under the NECO Plan	C/C/C
Uma scoparia Mojave fringe-toed lizard	Federal: None State: SSC BLM: Covered under the NECO Plan, Sensitive	U/U/U
Lichanura trivirgata Rosy boa	Federal: None State: None BLM: Covered under the NECO Plan, Sensitive	P/U/P
Sauromalus obesus Chuckwalla	Federal: None State: None BLM: Covered under the NECO Plan	C/U/P
Birds		
Aquila chrysaetos Golden eagle	Federal: None, MBTA State: Fully Protected, SSC, F& G Code 3503/3513 BLM: Covered under the NECO Plan, Sensitive	P/P/P (potential to forage only)
Asio flammeus Short-eared owl	Federal: None, MBTA State: SSC, F& G Code 3503/3513 BLM: Covered under the NECO Plan	P/P/P (potential to forage only)

Table 3.4-2 (continued)
Special Status Wildlife Species with the Potential to Occur in the Project Study Area

Scientific Name **Common Name**	**Status**	**Potential for Occurrence Alternative 1/ Alternative 2/ Alternative 3[1]**
Asio otus Long-eared owl (nesting)	Federal: None, MBTA State: SSC, F& G Code 3503/3513 BLM: Covered under the NECO Plan	P/P/P (potential to breed and forage)
Athene cunicularia Burrowing owl (burrow sites and some wintering sites)	Federal: None, MBTA State: SSC, F&G Code 3503/3513 BLM: Covered under the NECO Plan, Sensitive	C/C/C
Buteo regalis Ferruginous hawk (*wintering*)	Federal: None, MBTA State: SSC, F&G Code 3503/3513 BLM: Covered under the NECO Plan, Sensitive	C/C/P (potential to forage only)
Falco mexicanus Prairie falcon (wintering)	Federal: None, MBTA State: WL, F&G Code 3503/3513 BLM: Covered under the NECO Plan	C/C/C (potential to forage only)
Buteo swainsonii Swainson's hawk (nesting)	Federal: None, MBTA State: Threatened, F&G Code 3503/3513 BLM: Covered under the NECO Plan	C/C/C (potential to forage only)
Chaetura vauxi Vaux's swift (breeding)	Federal: None, MBTA State: SSC, F&G Code 3503/3513 BLM: Covered under the NECO Plan	U/U/U
Progne subis Purple martin (nesting)	Federal: None, MBTA State: SSC, F&G Code 3503/3513 BLM: Covered under the NECO Plan	U/U/U
Circus cyaneus Northern harrier	Federal: None, MBTA State: SSC, F&G Code 3503/3513 BLM: Covered under the NECO Plan	C/C/C (potential to forage only)
Lanius ludovicianus Loggerhead shrike	Federal: None, MBTA State: SSC, F&G Code 3503/3513 BLM: Covered under the NECO Plan	C/C/C
Toxostoma bendirei Bendire's thrasher	Federal: None, MBTA State: SSC, F&G Code 3503/3513 BLM: Covered under the NECO Plan, Sensitive	U/U/U
Toxostoma lecontei LeConte's thrasher	Federal: None, MBTA State: SSC, F&G Code 3503/3513 BLM: Covered under the NECO Plan, Sensitive	C/C/C
Mammals		
Spermophilus teriticaudus chlorus Palm Springs round-tailed ground squirrel	Federal: None *(former candidate for listing)* State: SSC BLM: Covered under the NECO Plan	C/C/P
Antrozous pallidus Pallid bat	Federal: None State: SSC BLM: Covered under the NECO Plan, Sensitive	P/P/P

Table 3.4-2 (continued)
Special Status Wildlife Species with the Potential to Occur in the Project Study Area

Scientific Name **Common Name**	**Status**	**Potential for Occurrence Alternative 1/ Alternative 2/ Alternative 3[1]**
Corynorhinus townsendii Townsend's big-eared bat	Federal: None State: SSC BLM: Covered under the NECO Plan, Sensitive	U/U/U
Eumops perotis californicus Western mastiff bat	Federal: None State: SSC BLM: Covered under the NECO Plan. Sensitive	P/P/P
Macrotus californicus California leaf-nosed bat	Federal: None State: SSC BLM: Covered under the NECO Plan, Sensitive	P/P/P
Nyctinomops femorosaccus Pocketed free-tailed bat	Federal: None State: SSC BLM: Covered under the NECO Plan	P/P/P
Vulpes macrotis arsipus *Desert kit fox*	*Federal: None* *State: CCR Title 14, § 460* *BLM: None*	*P/P/P*
Puma concolor browni Mountain lion (Yuma puma)	Federal: None State: None BLM: Covered under the NECO Plan	P/P/P
Neotoma albigula venusta Colorado Valley woodrat	Federal: None State: None BLM: Covered under the NECO Plan	P/P/P
Ovis canadensis nelsoni Nelson's bighorn sheep	Federal: None State: None BLM: Covered under the NECO Plan, Sensitive	P/P/P
Odocoileus hemionus eremicus Burro deer	Federal: None State: None BLM: Covered under the NECO Plan	C/P/C
Taxidea taxus American badger	Federal: None State: SSC BLM: Covered under the NECO Plan	P/P/P

[1]Potential for occurrence:
U: Unlikely
P: Potential
C: Confirmed

F&G Code 3503/3513 – California Fish and Game Code Sections 3503 and 3513 protecting migratory birds.

Amphibians

Couch's spadefoot toad (*Scaphiopus couchi*) is a BLM sensitive species, NECO Plan/EIS species, and California SSC. It occurs in a variety of vegetation types, including desert dry wash woodland and creosote bush scrub. It is well adapted to extremely dry conditions and spends most of its life in subterranean burrows, emerging for short periods only during spring and summer rains. It is

typically associated with ephemeral ponds/puddles that persist for a minimum of seven days and contain water temperatures greater than 15 degrees Celsius. It breeds explosively during scarce rainfall from May through September. Most breeding occurs during the first night after puddles form. Eggs typically hatch in less than one day and tadpoles transform in about one week. Couch's spadefoot toad's diet consists of invertebrates, specifically termites that also emerge during rains. This species is known to occur in the southeast region of California along the Colorado River western plains (CDFG 2010; BLM and CDFG 2002). The known western range boundary is greater than five miles from the Project Study Area: approximately eight miles from the eastern extent of the Access Road 2 (for Red Bluff Substation A) and eighteen miles from the Solar Farm sites. Based on the distance between the Project locations and the range limits, this species is not expected to occur in the Project locations.

Reptiles

The desert tortoise (Gopherus agassizii) is listed as threatened under the California ESA and the Mojave population is listed as threatened under the federal ESA. The federally-listed Mojave population includes those animals living north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, and southwestern Utah, and in the Sonoran (Colorado) Desert in California. Outside the listed Mojave population, the desert tortoise's range extends into Arizona and northwestern mainland Mexico. There are two recognized populations; these populations are isolated from one another by the Colorado River. All desert tortoises in California are part of the Mojave population.

Desert tortoises spend much of their lives in burrows, even during their seasons of activity between March and May. In late winter or early spring, they emerge from over-wintering burrows and typically remain active through fall. During their active periods, desert tortoises eat a wide variety of herbaceous vegetation, particularly grasses and the flowers of annual plants (Luckenbach 1982; Esque 1994).

Activity decreases in summer, but tortoises often emerge after summer rain storms to drink (Henen et al. 1998). During the summer activity period, tortoises retreat to burrows, shaded "palettes," or other shaded sites beneath shrubs or rocks during the most intense heat, and at night. They may aestivate (summer dormancy) in burrows during extended periods of heat and dryness. A single tortoise may have a dozen or more burrows within its home range, and different tortoises may use these burrows at different times. During periods of inactivity, their metabolism and water loss are reduced. Tortoises enter brumation (the reptilian equivalent of hibernation) during autumn (September to November, depending on conditions).

Desert tortoise habitats include desert alluvial fans, washes, canyon bottoms, rocky hillsides, and other steep terrain. Tortoises are most common in desert scrub, desert wash, and Joshua tree habitats, but occur in almost every desert habitat except on the most precipitous slopes. Friable soils, such as sand and fine gravel, are an important habitat component, particularly for burrow excavation and nesting. The presence of soil suitable for burrowing is a limiting factor to desert tortoise distribution (USFWS 1994a). Vegetation cover of typical desert tortoise habitat is dominated by creosote bush, burrobush (Ambrosia dumosa), Mojave yucca (Yucca schidigera), or blackbush (Coleogyne ramosissima). At higher elevations, Joshua trees and galleta grass are common plant indicators (USFWS 1994a).

The size of desert tortoise home ranges varies with respect to location and year (Berry 1986) and also serves as an indicator of resource availability and opportunity for reproduction and social interactions (O'Connor et al. 1994). Female tortoises have long-term home ranges that may be less than half that of the average male's home range, which can range to up to 200 acres (Burge 1977; Berry 1986; Duda et al. 1999; Harless et al. 2009). Over its lifetime, each desert tortoise may use more than 1.5 square miles of habitat and may make periodic forays of more than 7 miles at a time (Berry 1986).

Desert tortoises are long-lived and grow slowly. They require 13 to 20 years to reach sexual maturity. As adults, their reproductive rates are low, though their reproductive lifespan is long. The number of clutches (set of eggs laid at a single time) and number of eggs that a female desert tortoise produces in a season is dependent on conditions including habitat quality, availability of forage and drinking water, and the animal's physiological condition (Turner et al. 1987; Henen 1997; McLuckie and Fridell 2002). Egg-laying occurs primarily between April and July (Rostal et al. 1994; USFWS 1994b); the female typically lays 2 to 14 eggs (average 5 to 6) in an excavation near the mouth of a burrow or beneath a shrub (Woodbury and Hardy 1948; USFWS 1994b). The eggs typically hatch 90 to 120 days later, between August and October. The success rate of clutches has proven difficult to measure, but predation, while highly variable (Bjurlin and Bissonette 2004), appears to play an important role in clutch failure (Germano 1994).

Desert tortoise populations have declined for several reasons, each of which tends to be exacerbated by the others and most of which are associated with human land uses and other human activities. Most threats identified in the 1980s as the bases for state and federal listing continue to affect tortoise populations today (USFWS 2008). Habitat degradation and loss due to land use conversion, grazing, mining, energy development, and highway construction and expansion have all contributed to declining numbers and fragmentation of desert tortoise populations. Off-road vehicle use causes direct mortality from vehicle collision or crushed burrows and destruction of habitat. Desert tortoises are also vulnerable to vehicle collisions on roads and highways. Drought, habitat degradation, and associated weed invasion decrease nutrients available to desert tortoises in their food; this makes them susceptible to upper respiratory tract disease, and possibly other diseases, which can be fatal and is transmittable among populations (Jacobson 1992). Tortoises also are vulnerable to predation by ravens, coyotes, and domestic and feral dogs. Infrastructure development and urbanization creates perch sites and food and water sources for ravens, and increases numbers of dogs, all of which elevate predation pressure on juvenile tortoises. Other threats include illegal collecting, vandalism, livestock grazing, feral burros, non-native plants, changes to natural fire regimes, and environmental contaminants (USFWS 1994). Habitat fragmentation and development can isolate tortoise populations, further increasing risk of disease and reducing genetic diversity. This range of threats can kill or indirectly affect desert tortoises and their habitat, but little is known about the relative contribution each threat makes to tortoise demography (Boarman 2002, USFWS 2008a). Current recovery planning focuses on expanding the knowledge of individual threats and places emphasis on understanding their multiple and combined effects on tortoise populations.

The USFWS published the Desert Tortoise (Mojave Population) Recovery Plan in 1994 and published a Draft Revised Recovery Plan for the Mojave Population of the Desert Tortoise in 2008. Since 1994, research indicates generally continuous variation in genetic structure and ecological biomes across the Mojave population's range. On the basis of this new information, the draft revised recovery plan redefines the recovery units to balance regional distinctiveness and variability within the population. If adopted, the draft revised recovery plan will reduce the number of recovery units from six to five, to reflect new analyses and ensure that local adaptations and genetic diversity are maintained.

The Project site is located within the Eastern Colorado Recovery Unit (USFWS 1994), which would be merged with the adjacent Northern Colorado Recovery Unit upon finalization of the draft revised recovery plan. The new recovery unit will be referred to as the Colorado Desert Recovery Unit (USFWS 2008). Within this recovery unit desert tortoises are found primarily in "well-developed washes, desert pavements, piedmonts, and rocky slopes characterized by relatively species-rich succulent scrub, creosote bush scrub, and blue palo verde-ironwood-smoke tree communities" (USFWS 1994). Habitat within this recovery unit was described as being in excellent condition despite declines in tortoise densities over the past several decades; disturbance was estimated at less than 1.3 percent throughout (USFWS 2005).

Critical Habitat: The proposed Solar Farm (layouts B and C) is not within designated desert tortoise critical habitat, but Red Bluff Substation alternative locations A and B, SCE access roads 1 and 2, and portions Alternative gen-tie Line B-2 would be within designated critical habitat (Figure 3.4-5) (USFWS 1994a). These portions of the project area are also within the Chuckwalla Desert Wildlife Management Area (DWMA), discussed further in Section 3.4.6, Wildlife Management Areas.

Before the biological surveys were done, desert tortoises had been found immediately northeast and approximately six miles southwest of the Project Study Area. During surveys conducted for the proposed Project, scat, burrows, and live tortoises were observed within the footprint of Alternatives 1, 2, and 3 (Figures 3.4-1 and 3.4-2). Alternatives 1 and 3 contain less active desert tortoise signs than Alternative 2; Alternative 3 contains the least number of active desert tortoise signs. *The majority of the desert tortoises and sign observed during the field surveys were located within the Project Study Area (as described in Appendix H) but outside the proposed project areas as described in Alternatives 1 through 3. Four desert tortoises were recorded within the boundaries of Solar Farm Layout B, and several others were just outside the northwestern boundary of Layout B. Two desert tortoises were recorded within Solar Farm Layout C. One desert tortoise was found along gen-tie alternative alignment A-1; none along alignment A-2, and four were along alignment B-2. No desert tortoises were found at Substation alternative site A, and five were found at Substation alternative site B. Note that the Biological Resources Technical Report (Appendix H) reports six tortoises within the Solar Farm B configuration; the difference is due to reduced size of the Solar Farm B layout as analyzed in this EIS.* Desert tortoise carcasses recorded during surveys are presented in Figure 3.4-3. The carcass data match well with the current desert tortoise use of the area presented in Figures 3.4-1 and 3.4-2. Approximately the same number of desert tortoise carcasses were found within the Alternatives 1 and 2 configurations, with fewer found in the Alternative 3 configuration.

The actual number of desert tortoises on the project site cannot be determined from field survey data alone, due to the possibility that some tortoises may have been overlooked during surveys (e.g., they may have been in deep burrows where they could not be seen); and some may have been double-counted if they moved from one survey transect line to another during the field work. Further, the number of tortoises found on the site during field surveys may not reflect the actual number of tortoises that use the site or may need to be removed prior to construction, because tortoises may move onto or off of the project site prior to initiation of project construction.

Concurrent with and separate from this EIS, a formal Biological Assessment (BA) is being prepared, in accordance with Section 7(b) of the ESA of 1973, 16 USC §§ 1531 et seq., and the regulations contained in 50 CFR § 402.12, following formal Section 7 consultation procedures with the USFWS. The BA is addressing potential adverse effects of the Project on the desert tortoise and its designated critical habitat. At the conclusion of the formal Section 7 consultation process, a BO will be issued by the USFWS for the proposed Project.

Mojave fringe-toed lizard (*Uma scoparia*) is a BLM sensitive species, NECO Plan/EIS species, and California SSC restricted to dune*s or habitats providing scattered patches of fine windblown sand, stabilized sand flats, or (less commonly) sandy washes,* in the California and Arizona deserts. *Suitable sand systems occur in isolated locations across its geographic range. This fragmented pattern leaves the species vulnerable to local extirpations from habitat loss, local fragmentation, or stochastic events. Murphy et al. (2006) identified two maternal lineages; the northern lineage is associated with the Amargosa River drainage system, and the southern with the Mojave River drainage system, Bristol Trough, Clark's Pass (including Palen Lake and Pinto Wash), and the Colorado River sand transport systems. The northern lineage is under review for listing under the federal Endangered Species Act, but the southern lineage is not under review for listing (USFWS 2008).*

The Mojave fringe-toed lizard is found in arid, sandy, sparsely vegetated habitats, within the broader matrix of creosote bush scrub, throughout much of its range (Norris 1958). The most important factor in its habitat is the presence of fine sands, but it also uses surrounding desert habitat. It is restricted to habitats where fine, loose, aeolian (windblown) sand, typically with grain size no coarser than 0.375 mm in diameter and at least a few inches deep, is available (Stebbins 1944; Turner et al. 1984, CDFG 2010). It burrows in the sand to avoid predators and to thermoregulate (Stebbins 1944), though it will also seek shelter in rodent burrows. Sand dunes provide its primary habitat, although it can also be found in the margins of dry lakebeds, washes, and isolated sand habitat, such as scattered hummocks or wind-deposited "sand ramps" against hillsides (BLM et al. 2005).

The Mojave fringe-toed lizard occurs on unvegetated dunes, and also where vegetation is present, including creosote bush scrub (Murphy et al. 2006). A study by Cablk and Heaton (2002) at Marine Corps Air Ground Combat Center at Twentynine Palms documented Mojave fringe-toed lizard populations in a broader area than expected and concluded that more habitat than just aeolian sands must be identified for management. The same authors described occupied habitat near Lead Mountain as "medium-pack sand," further indicating that suitable habitat may exist as a matrix of sand hummocks or patches interspersed with hard packed surfaces. Aeolian sand originates from hydrological processes (i.e., fluvial transport and sorting from desert mountains onto valley floors) (Lancaster and Tchakerian 2003). Thus, desert washes where fine sand is available may also serve as Mojave fringe-toed lizard habitat.

Aeolian sand habitat is vulnerable to both direct and indirect disturbances (Weaver 1981; Beatley 1994; Barrows 1996). Environmental changes that stabilize sand, affect upwind sand sources, or block sand movement corridors will also affect Mojave fringe-toed lizards and other species requiring this specialized habitat (Turner et al. 1984; Jennings and Hayes 1994). Threats to Mojave fringe-toed lizard and its habitat include land use conversion, off-highway vehicles and other direct and indirect impacts of regional development. Aside from the direct loss of land, development can also affect Mojave fringe-toed lizards by blocking upwind sand transport or by increasing access by predators, such as the common raven and small raptors. For example, predation by kestrels or loggerhead shrikes may increase due to availability of new perch sites (e.g., fence posts, sign posts, structures) which allow them to hunt for lizards in areas where no perches were previously available. Indirect habitat degradation results from the disruption of the dune ecosystem source sand, wind transport, and sand transport corridors. Thus, Mojave fringe-toed lizard conservation requires the conservation of blowsand ecosystems processes, including the sand source, fluvial sand transport areas, aeolian sand transport areas, wind corridors, and the occupied habitat (Bureau of Land Management 2005).

To evaluate potential for direct or indirect impacts to Mojave fringe-toed lizard habitat, a windblown geomorphology study[1] was undertaken, as discussed in Section 3.3, Vegetation, to assess any potential impacts from windblown sand within the proposed *and alternative* footprints of the Solar Farm *and to determine specifically whether any of the Solar Farm sites are within a sand transport corridor* (Kenney 2010). *The aeolian geomorphology evaluation covered the Solar Farm alternative sites (layouts B and C); these are the only project component sites with potential to affect active or partially stabilized dune habitat.* According to this study, a portion of the Project Study Area, east of Pinto Wash (which is east of the Solar Farm), supports dunes that intergrade with stabilized and partially stabilized desert dunes and sand fields; however, no active dune fields were identified within the Project locations. The study also determined that the Solar Farm was not within a sand transport corridor and that the Project would not have any effects on aeolian sand migration.

[1] The terms "windblown geomorphology study" and "aeolian geomorphology evaluation" refer to the same study.

The Solar Farm site is primarily characterized by coarse-textured alluvial fans characterized by unsorted rocky and gravelly alluvial deposits and, in some areas, desert pavement. Relict windblown sand deposits, coppice dunes, and sandy washes are described in Section 3.3, Vegetation*. These small, isolated patches of sand are generally too shallow, hardened on their surfaces, unsuitable for burrowing or egg laying by Mojave fringe-toed lizard, and well-separated from suitable habitat to the east. Based on poorly suitable habitat conditions and distance from known suitable habitat, presence of the Mojave fringe-toed lizard on the Solar Farm site is unlikely.*

Mojave fringe-toed lizard occurs near Bristol Dry Lake, Cadiz Dry Lake, Dale Dry Lake, Rice Valley, Pinto Basin, Palen Dry Lake, and Ford Dry Lake. It has also been observed approximately five miles east of the Project, at the Palen and Genesis solar project sites located southeast of the Solar Farm site area, and suitable habitat is located one mile east of the Solar Farm Alternative sites, at the toe slopes of the Coxcomb Mountains. However, the Project site would not serve as a movement corridor for MFTL connecting the aforementioned areas because it provides no aeolian or alluvial sand habitat linkage between them.

Rosy boa (*Lichanura trivirgata*) is a BLM sensitive species and NECO Plan/EIS species and has no other special status. *The rosy boa is widely but sparsely distributed in desert and chaparral habitats throughout southern California (CDFG 2010). In the desert, it is typically found in areas with moderate to dense vegetation and rock cover (CDFG 2010). Suitable habitat for this species occurs in the rocky washes (e.g., Big Wash) east of the Solar Farm alternatives and in the rocky foothills of the surrounding mountains. Rosy boas were not observed during the surveys conducted by Ironwood; however, this species may occur along GT-B-1 within Big Wash, near Victory Pass, and within the rock outcroppings within the Red Bluff Substation A Study Area. Habitat throughout the Solar Farm alternative layouts is also marginally suitable. Therefore, this species has the potential to occur in the footprints of Alternatives 1 and 3.*

Chuckwalla (*Sauromalus obesus*), a large lizard, is a NECO Plan/EIS species. Habitat for this species includes areas that have large rocks and boulders*, and bedrock outcrops. Chuckwallas occur throughout the Mojave and Sonoran Deserts in California, Nevada, Utah, Arizona, and Mexico. They are found in appropriate habitat throughout the NECO planning area (BLM 2002). Within the Project Study Area, observations of this species* are limited to a small area within the Red Bluff Substation A *site*. This species was observed during surveys within Red Bluff Substation A, including immediately south of Access Road 1 (Figure 3.4-4).

Birds

Golden eagle (*Aquila chrysaetos*) is a state fully protected raptor, a California SSC, is protected under the Bald and Golden Eagle Protection Act, is a BLM sensitive species, and is covered under the NECO Plan/EIS. *Threats include nesting habitat and foraging habitat loss or damage due to land use changes and increased development on open lands, illegal shooting and nest disturbance, pesticides, and power line electrocution.* Golden eagles and their primary prey species, jackrabbits, have declined in the California desert regions due to prolonged drought conditions that have persisted since 1998 (WRI 2010). *Golden eagles generally nest in rugged, open habitats with canyons and escarpments, with overhanging ledges, cliffs or large trees as cover. Nesting golden eagles may be susceptible to disturbance from noise and other human activities, and may abandon nests if disturbed.* Breeding in southern California starts in January, nest building and egg laying *occurs from* February to March, and hatching and raising the young eagles from April through June. Once the young eagles are flying on their own, the adults will continue to feed them and teach them to hunt until late November. Golden eagles have nesting territories, most of which have up to six nests (Pagel et al. 2010). A nesting territory is defined as an area that contains, or historically contained, one or more nests within the home range of a mated pair; it is a confined locality where nests are

found, usually in successive years, and where no more than one pair is known to have bred at one time (Pagel et al. 2010). Golden eagles require large areas for foraging and an abundance of prey. It is estimated that golden eagles within the Mojave Desert have home ranges from 100 to 120 square miles (260 to 311 square kilometers) that they use for foraging (Fesnock 2010); assuming a circular territory, this equates to a 6.2–mile (10-kilimeter) radius around the nests of a territory. *The USFWS recommends that inventories for golden eagles should be conducted if suitable nesting, roosting, and foraging habitat are present on a proposed project site or within a 10-mile radius of the site (Pagel et al. 2010). The Project site provides suitable golden eagle foraging habitat but no suitable nesting habitat.*

During golden eagle surveys performed for the proposed Project, no golden eagle nests were found on or next to the Project locations. According to the BLM's golden eagle database and the golden eagle surveys performed for the proposed Project, there are or were eight *golden eagle* territories, within a 10-mile (16-kilometer) radius of the proposed Project *including alternative solar field layouts and other components* (*WRI* 2010). Of the eight territories, six are considered active *or potentially active*, and two are historic. *Within the six active or potentially active territories, two active nesting sites and four potentially active nesting sites were identified within a 10-mile (16 kilometer) radius of the proposed Project.* The closest active *nesting site* is in the southwest portion of the Coxcomb Mountains within the Joshua Tree National Park (referred to as the Coxcomb Mountain Southwest Territory), approximately *four* miles (*2.5* kilometers) from the proposed Solar Farm *layouts B or C* site boundaries. While there is no suitable nesting habitat for the golden eagle within the Project locations, the species may forage there during nesting, wintering, or migration. Given the proximity of the Coxcomb Mountains Southwest Territory, it is highly likely that the Project site overlaps the territorial foraging area of this pair of eagles. One observation of a golden eagle flyover of the Chuckwalla Valley was also recorded during surveys conducted for the proposed Project (WRI 2010).

Golden eagle territories may be inactive in some years, but they may be used later by the same or different individuals as the habitat and prey species cycle through to more productive years. Therefore, unoccupied territories are considered potentially active in future years. Other active or inactive nest sites are reported about ten miles northwest of the Solar Farm layouts (B or C), about four miles north of Red Bluff Substation alternative site B, and about two to three miles south of proposed SCE access road 1. As described above for the Coxcomb Mountains Southwest Territory, golden eagles occupying any of these local territories would be likely to forage over the Project site. In addition, golden eagles (and other raptors) forage more widely outside of the nesting season, since they have no need to return daily to eggs or young at their nests. Golden eagles could forage over the Project area at any time of year. Foraging birds could include mated pairs using the surrounding nesting territories; or, if the territories are inactive, unmated golden eagles or adult birds whose nests may have failed, could forage over the site during breeding season. Foraging would be somewhat more common during winter and migration seasons due to larger numbers of golden eagles in the region and their larger winter foraging ranges. Nesting individuals of the short-eared owl (*Asio flammeus*) and long-eared owl (*A. otus*) are NECO Plan/EIS species and California SSC that inhabit open areas and nest on the ground or in low trees or shrubs. Nine individuals of either the short-eared owl or long-eared owl were observed during surveys west of the locations of SF-B and SF-C (Figure 3.4-4), but not within the Project component locations. Because it is difficult to distinguish between the two species in the field, either species could have been observed during surveys. The Project Study Area is outside of the breeding range of the short-eared owl but within the breeding range of the long-eared owl, so either species could occur in the Project locations. However, only the long-eared owl is expected to nest in the area.

Burrowing owl (*Athene cunicularia*) is a BLM sensitive species, NECO Plan/EIS species, and California SSC that inhabits open dry grasslands and desert scrub and nests underground typically in mammal burrows, although they may use man-made structures including culverts and debris piles. They exhibit strong nest site fidelity. Burrowing owls eat insects, small mammals and reptiles. Burrowing owls can be found from California to Texas and into Mexico. In some case, owls migrate into southern deserts during the winter. Three individuals of this species and nine records of sign for this species were observed within the Project Study Area during surveys (Figure 3.4-4). Individual owls were observed throughout different times of the year during surveys within the Project Study Area, with no pairs or young observed. Four records of sign and one individual were found within the Alternative 1 area, two records of sign were recorded in Alternative 2, and three records of sign were recorded in Alternative 3.

Nesting individuals of the ferruginous hawk (*Buteo regalis*) and prairie falcon (*Falco mexicanus*) are BLM sensitive species, NECO Plan/EIS species, and California SSC. Their nests are generally found on cliffs, in high rocky areas, or in tall trees. Migrant ferruginous hawks are regular but uncommon during spring and fall in the California southern desert region. Ferruginous hawks may forage within the Project Study Area during wintering or migration season, while prairie falcons may forage over the site year-round.

Prairie falcons are found in areas of the dry interior where cliffs provide secure nesting sites. In the desert they are found in all vegetation types, although sparse vegetation provides the best foraging habitat. Although these species were observed in flight over the Project Study Area during surveys, no nesting habitat for them was found there. Therefore, the potential for these species to nest within the Project locations is low.

Swainson's hawk (*Buteo swainsonii*) nesting sites are listed as threatened under the CESA and are generally found on cliffs, in high rocky areas, or in tall trees. Although this species is likely to forage within the Project Study Area during wintering or migration season and was observed in flight over the Project Study Area during surveys, no nesting habitat for them was found within the Project Study Area. Therefore, the potential for this species to nest within the Project locations is low.

Nesting sites of Vaux's swift (*Chaetura vauxi*) and purple martin (*Progne subis*) are NECO Plan/EIS species and California SSC. Both of these species are unlikely to nest within the Project Study Area but may be found as occasional migratory season visitors in the area. Neither species was observed during field surveys. These species have a low potential to occur within the Project locations.

Northern harrier (*Circus cyaneus*) is a NECO Plan/EIS species and California SSC that has been observed in the region of the Project Study Area (Solar Millennium 2009; Genesis Solar 2009), and flying over the locations of Alternatives 1, 2, and 3 (Figure 3.4-4). This species nests on the ground in marshes, meadows, grasslands, and cultivated fields. As such, it is unlikely to nest within the Project locations but may forage in this area during winter or migratory seasons.

Loggerhead shrike (*Lanius ludovicianus*), Bendire's thrasher (*Toxostoma bendirei*) and LeConte's thrasher (*T. lecontei*) are NECO Plan/EIS species and California SSC; Bendire's thrasher and LeConte's thrasher are also BLM sensitive species. These species inhabit various desert scrub and wash habitats. Shrikes typically build nests one to three meters above the ground depending on the height of the vegetation. The Project Study Area is out of the Bendire's thrasher's known geographical range, making this species unlikely to occur. During surveys, loggerhead shrike and LeConte's

thrasher were both observed in the Project Study Area within and near the Project component locations (Figure 3.4-4); 29 loggerhead shrikes were observed within the footprint of Alternative 1, 31 were observed within Alternative 2, and 25 were observed in Alternative 3. Two LeConte's thrashers each were observed within Alternatives 1, 2, and 3.

Mammals

Palm Springs round-tailed ground squirrel (*Spermophilus tereticaudus chlorus*) *is a California SSC and* is covered under the NECO Plan/EIS. *It was formerly a candidate for listing under the federal ESA, but is no longer a candidate due to habitat conservation efforts in the Coachella Valley and new information indicating that its geographic range is much larger than previously understood (USFWS 2010).*

The Palm Springs round-tailed squirrel is typically associated with partially stabilized dunes supporting hummocks of mesquite (Prosopis glandulosa), but may also be found in dunes or partially stabilized aeolian sands supporting creosote bush scrub or other vegetation (USFWS 2010). This small ground squirrel seems to prefer areas where hummocks of sand accumulate at the base of large shrubs that provide burrow sites and adequate cover. They may also be found in areas where sandy substrates (those appropriate for burrow construction) occur in desert saltbush or desert sink scrub that supports herbaceous growth. In addition to wind blown sand habitats, the squirrel may occur in areas of coarser sands associated with desert dry washes. Their home ranges vary throughout a season and depend on the availability of food and water. When food and water are scarce, squirrels can move 200 to 400 meters per day. In years when food and water are more plentiful the size of their home range shrinks between their burrows and foraging areas. They are active for six months (February-July) and inactive for six months (August-January).

Threats to the Palm Springs ground squirrel include loss of habitat, including mesquite hummocks; their persistence is threatened by its relatively small range. As ground dwelling small mammals, they are susceptible to impacts from surface disturbances that could crush their burrows. As they seem to prefer open areas with adequate visibility, invasive exotic plants may reduce habitat suitability. Development of roads creates barriers to movement, kills individuals and results in the permanent loss of habitat. Loss of habitat can degrade the functional value of the habitat by degrading or destroying intervening habitat as well as prevent recolonization of temporarily unoccupied habitats. Fragmented habitats result in severed gene flow between populations and an overall reduction in the resiliency of the population or species as a whole.

Habitat loss is the primary risk for the decline of this squirrel, which has been observed within the north end of the GT-A-1 and GT-B-2 corridors within Alternatives 1 and 2 (Figure 3.4-4). It was not found in or near any of the other Project locations, *and* habitat appears to be *poorly suitable* throughout most of the Project Study Area.

Five bat species, pallid bat (*Antrozous pallidus*), western mastiff bat (*Eumops perotis californicus*), pocketed free-tailed bat (*Nyctinomops femorosaccus*), Townsend's big-eared bat (*Corynorhinus townsendii*), and California leaf-nosed bat (*Macrotus californicus*) are NECO Plan species and California SSC that inhabit desert scrub and woodland habitats with rocky areas, caves and mines, and tall trees and buildings for roosting. All of these species are also BLM sensitive species, with the exception of the pocketed free-tailed bat.

Townsend's big-eared bat forages relatively close to its mine and cave roosts, although no mines or caves are close to any of the Project component locations (Brown 2010). As a result, this species is unlikely to occur within the Project locations.

Pallid bat and California leaf-nosed bat forage within desert washes. Pallid bats roost in *crevices in boulder outcroppings*, while California leaf-nosed bats have been known to roost in ironwood trees in the warmer months. Pocketed free-tailed bats occur in creosote bush habitats. Western mastiff bat occurs in the area and forages high off the ground (Brown 2010). Pallid bat roosting habitat occurs throughout the Project Study Area. Marginal roosting and foraging habitat for the other species is found within the layouts of SF-B and SF-C in the sparse dry wash woodland area in the southernmost part of the Solar Farm layouts (Figure 3.3-1), and roosting habitat is found in the dry desert wash woodland within each of the Gen-Tie Line and Red Bluff Substation locations (Figure 3.3-2). The nearest records of these species are all approximately five miles from the Project Study Area, and no observations of bats were made during surveys. The potential for these species to inhabit the Project locations is low, except in areas of denser dry wash woodland where the potential is high. In addition, all three of these species may forage within the Project locations.

Mountain lion (a.k.a., Yuma puma [*Puma concolor browni*]) is a NECO Plan/EIS species that is known to inhabit the low mountains and to use the desert dry wash woodlands following the trails of burro deer in areas next to the Project Study Area (Pinto Wash next to the Solar Farm site; Figure 3.3-1). No records of this species are found in the Project Study Area, and the species is most likely to use Pinto Wash next to the Project location. However, potential foraging habitat exists for the species in the Project location.

Colorado Valley woodrat (*Neotoma albigula venusta*) is a NECO Plan/EIS species that inhabits low-lying desert areas and is closely associated with beavertail cactus (*Opuntia* sp.) and mesquite (*Prosopis* sp.). A different species of woodrat, desert woodrat (*Neotoma lepida*) was incidentally detected during baseline small mammal trapping surveys within the Solar Farm Study Area, suggesting that the Colorado Valley woodrat is not present within this area. Nevertheless, because the Project locations support appropriate habitat for this species, and records of the species are found approximately ten miles from the Solar Farm site, this species is considered to have a moderate potential to occur within the Project locations, although it was not observed during biological surveys.

Nelson's bighorn sheep (*Ovis canadensis nelsoni*) is a BLM sensitive species and a NECO Plan/EIS species that inhabits open rocky steep areas with available water sources. *The bighorn sheep in local mountain ranges are* not the Peninsular bighorn sheep *"distinct population segment"* that is *state and* federally listed and state fully protected. *Nelson's bighorn sheep in local mountain ranges prefer open areas of low-growing vegetation for feeding, with proximity to steep, rugged terrain for escape, lambing, and bedding, an adequate source of water, and travel routes that link these areas. They graze and browse on a wide variety of plant species with green, succulent grasses and forbs preferred. They usually feed in open habitats, such as rocky barrens, meadows, and low, sparse brushlands. They generally remain near rugged terrain while they feed but use open habitat for escape and bedding. Water is critical to their survival. In the California desert, bighorn sheep must remain within daily access of drinking water during summer. In less arid regions, and during mild seasons, they can go for longer periods of time without water. Water sources they commonly use include springs, water in depressions, and human-made sources.*

Bighorn sheep movement can be categorized into two general types, daily movements and seasonal movements. Daily movement includes movement between watering areas, foraging areas, and resting areas, which normally do not exceed more than a few miles in a day. Seasonal movements include movement to other parts of a range or to other mountain ranges in response to changes in vegetation quality, water availability or weather which can include several thousand feet

in elevation and a 20- or 30-mile movement to another range. Impeding either of these movement patterns can be devastating to a bighorn sheep population.

Radio telemetry studies of bighorn sheep in various southwestern deserts, including the Mojave Desert of California, have found considerable movement of these sheep between mountain ranges (Bleich et al. 1990b). Intermountain movements provide a genetic connection with a larger metapopulation and are the source of colonization of vacant habitat. Intermountain areas of the desert floor that bighorn traverse between mountain ranges are as important to the long-term viability of populations as are the mountain ranges themselves (Schwartz et al. 1986; Bleich et al. 1990b, 1996). Actions that impair the ability of bighorn sheep to move between mountain ranges include fencing along highways or other boundaries, canals, and high densities of human habitation. These barriers will limit the potential for natural colonization and gene exchange, both of which are key to metapopulation viability.

This species is known to live in the mountainous rocky areas of Joshua Tree National Park west and northwest of the Solar Farm alternatives, and in the Chuckwalla Mountains south of I-10. The bighorn sheep population in the Chuckwalla area is estimated at between 25 and 50 individuals (Epps et. al 2004) and the population in Joshua Tree National Park is estimated at 200 individuals throughout the park (NPS 2010). *This population is known to cross the northern extreme of the Chuckwalla Valley between Joshua Tree National Park and the Coxcomb Mountains.*

Although it is likely that this species would use the edges of the valley floor that are close to mountainous terrain, they could also use open areas of the valley floor serving as a linkage between neighboring mountainous regions and allowing gene flow to occur between subpopulations (USFWS 2000). This species migrates between winter and summer ranges, moving down slope into canyons in winter. Although there have not been any sightings or observed tracks of this species over several years of pedestrian surveys conducted in the Project Study Area, potential exists for them to occur in the Project Study Area.

Burro deer (*Odocoileus hemionus eremicus*) is a NECO Plan/EIS species that is known to occur in desert dry wash woodlands in the vicinity of the Project Study Area. Three individuals and numerous tracks were observed in Red Bluff Substation A, with individuals also observed along Access Roads 1 and 2.

American badger (*Taxidea taxus*) is a NECO Plan/EIS species and California SSC that inhabits open shrub areas of the desert that support good soils for burrowing *in areas with sparse overstory cover. This species is uncommon but found throughout most of the state and is most abundant in drier open stages of most shrub forest, and herbaceous habitats, with friable soils.* This species was not observed during biological surveys but has a high potential to occur within the Project component locations. This is because badgers have been observed during recent surveys of the Palen Solar Power Project site about 10 miles southeast of the Solar Farm sites (Solar Millennium 2009), and good habitat for this species is found throughout the Project Study Area.

Desert Kit Fox (Vulpes macrotis arsipus) is not listed as a special-status species by the State of California, BLM, or the USFWS, but it is protected under Title 14, California Code of Regulations (Title 14, Section 460) from trapping and hunting. These activities are not proposed under any of the Project alternatives. It can be found in much of the same habitats as the badger. Kit foxes are primarily nocturnal, and inhabit open level areas with patchy shrubs. Friable soils are necessary for the construction of dens, which are used throughout the year for cover, thermoregulation, water conservation, and rearing pups. Desert kit fox is present within the Project Study Area (Appendix H) and it may occur anywhere throughout the Project site. Estimates of kit fox home range size vary widely, and population densities fluctuate drastically depending on the prey availability, predation pressures, and other factors; and many kit

fox home ranges overlap considerably. Therefore, it is difficult to estimate the actual number of desert kit foxes that may occupy the Project site.

3.4.5 Wildlife Corridors

The extent, distribution, and accessibility of suitable habitat affect the long-term viability of regional wildlife populations. Fragmentation and isolation of natural habitat ultimately results in the loss of native species within those areas (Soulé et al. 1988). Wildlife movement among habitat areas is important to long-term genetic variation and demography. In the short term, it may also be important to individual animals' ability to occupy their home ranges, if their ranges extend across a potential movement barrier. These considerations are especially important for rare, threatened, or endangered species such as the desert tortoise, and wide-ranging species which exist in low population densities such as large mammals. Therefore, this discussion of wildlife movement focuses on conditions relevant to desert tortoise and Nelson's bighorn sheep movement. However, these conditions are also relevant for other species, including corridor "passage" and corridor "dweller" species (Beier and Loe 1992). Corridor passage species would traverse connectivity areas during ordinary diurnal or seasonal movement patterns, whereas corridor dweller species must persist as viable populations over multiple generations within a connectivity area in order to eventually migrate from one habitat block to another.

In landscapes where native habitats exist as partially isolated patches surrounded by other land uses, planning for wildlife movement generally focuses on "wildlife corridors" to provide animals with access routes among habitat patches. In largely undeveloped areas, including the Chuckwalla Valley, wildlife habitat is available in extensive open space areas throughout the region, but specific linear barriers may impede or prevent movement. In these landscapes, wildlife movement planning focuses on sites where animals can cross linear barriers, but generally does not emphasize linear corridors among habitat areas.

A recent state-wide evaluation of habitat connectivity (Spencer et al. 2010) includes the upper Chuckwalla Valley, including the Project Area, among areas identified as "Essential Connectivity Areas." The report describes these as follows: "Essential Connectivity Areas are placeholder polygons that can inform land-planning efforts, but that should eventually be replaced by more detailed Linkage Designs, developed at finer resolution based on the needs of particular species and ecological processes" (p. xiii). Spencer et al. (2010) recommend siting renewable energy projects in the Sonoran Desert region where they will not block potential wildlife movement corridors, and make several other recommendations related to roadway crossings and fencing (p. 69). In Chapters 4 and 5, Spencer et al. (2010) provide "frameworks" for regional and local scale connectivity analysis. The BLM is currently evaluating more localized connectivity priorities in the region. Preliminary results of that analysis, which is based on modeled connectivity requirements for desert tortoise, Nelson's bighorn sheep, American badger, and desert kit fox, do not indicate that the Solar Farm layouts analyzed here are within a priority linkage area (A. Fesnock, pers. comm).

In Chuckwalla Valley, the biologically important functions of biological connectivity are the long-term demographic and genetic effects of occasional animal movement among mountain ranges and other large habitat areas. Desert tortoises and other less-mobile animals may live out their entire lives within a "corridor" area between larger habitat blocks; for these species, movement among mountain ranges may take place over the course of several generations (Beier and Loe 1992). However, larger and more mobile animals such as Nelson's bighorn sheep may travel across the valley infrequently, as a part of dispersal among partially isolated subpopulations. It is unlikely that any individual animal would need to move across the valley to access different parts of its regular home range.

The proposed Project lies within the Chuckwalla Valley. *The proposed Project is bordered on the south by the Chuckwalla Mountains, south of the I-10. Opportunity for north to south wildlife movement between Joshua Tree National Park and the Chuckwalla Mountains is significantly impeded by the I-10 Freeway. A few other existing*

linear features (unpaved transmission line and pipeline access roads) are parallel to the freeway but have only minimal effects on wildlife movement. Some species, such as coyote, may learn to cross the freeway safely. But for most terrestrial species the freeway presents an impassable or high risk barrier to north-south movement. There are potential wildlife crossings beneath the freeway at scattered wash crossings and at the underpasses at Desert Center Road and Eagle Mountain Road. Wildlife use of these washes and undercrossings may be limited by the sizes of the wash structures and traffic at the undercrossings. But wildlife access to them is only minimally impeded by scattered unpaved roads to the north and south.

The Solar Field alternative layouts are about three miles east of the Eagle Mountains and Joshua Tree National Park, and *about two miles west of* the Coxcomb Mountains, *also in* Joshua Tree National Park (Figures 3.4-1 through 3.4-5 and Figure 7 in the BRTR contained in Appendix H). *Extensive protected open space within Joshua Tree National Park, north of the Project site, links the Eagle Mountains and Coxcomb Mountains, providing biological connectivity. In addition, BLM-managed public lands within the Project Study Area but north of the solar field alternative layouts addressed in this analysis, provide further biological connectivity between the two mountain ranges. Pinto Wash lies between the eastern project boundary and the Coxcomb Mountains.* Areas that correspond with Joshua Tree National Park are also within the occupied range of a Big Horn Sheep WHMA. *The primary existing linear impediments to east-west wildlife movement between the Eagle Mountains and Coxcomb Mountains are Kaiser Road and Eagle Mountain Road. Any terrestrial wildlife species could cross the roads. Wary or fast-moving animals such as medium- to large-sized mammals would probably cross safely in most crossing attempts, but some road mortality would also be expected. Slower-moving animals, particularly desert tortoise, would be at high risk of mortality during any road-crossing attempt. Other minor anthropogenic impediments to east-west wildlife movement include scattered unpaved roads, the Eagle Mountain quarry and surrounding structures and features (including railroad tracks), and some scattered agricultural lands. None of these land uses presents a significant barrier to east-west wildlife movement in the vicinity of the Solar Farm site. The aqueduct presents a more difficult barrier but wildlife is able to cross where drainages are directed under it.*

The two alternative substation sites and the SCE access routes are between the I-10 Freeway and steep bajada and toeslopes of the Chuckwalla Mountains. Gen-Tie lines linking the solar farm and substation sites would have minimal impact on terrestrial wildlife movement due to the relatively small footprints and wide spacing between tower structures. For some species, likely including desert tortoise, movement east and west along the base of the Chuckwalla Mountains is largely constrained by the Freeway on one side and steep topography on the other as well as numerous existing transmission lines, underground lines, roads, and associated structures. This leaves a relatively narrow corridor for east to west movement south of the Freeway. Both substation alternatives are located within this corridor.

3.4.6 Wildlife Management Areas

Chuckwalla Desert Wildlife Management Areas

Desert Wildlife Management Areas (DWMAs) were established in the NECO Plan and address the recovery of the desert tortoise. They are intended to be areas where viable desert tortoise populations can be maintained. These are stand-alone areas that cover much of the designated critical habitat for the desert tortoise. As such they may and do overlap with some existing protected areas, such as critical habitat. On BLM lands, DWMAs are also designated as ACECs. The BLM has developed a set of specific DWMA management prescriptions, outlined in the NECO plan; in general, emphasis is placed on minimizing disturbance and maximizing mitigation, compensation, and restoration from authorized allowable uses. Within these areas, the land is given a Multiple-Use Class L (Limited Use) designation.

The Chuckwalla DWMA was designated to protect desert tortoise as well as significant natural resources, including special status plant and animal species and natural communities. It encompasses 818,685 acres, 465,287 acres of which (57 percent) are on BLM land. *Conservative estimates based on the USGS habitat model indicate that approximately 70 percent of the Chuckwalla DWMA is suitable desert tortoise habitat with the remaining 30 percent unsuitable.* As defined in the NECO Plan, examples of management actions to protect resources within the Chuckwalla DWMA include designating lands as *Multiple Use Class (*MUC*)* L (Limited Use), limiting cumulative new surface disturbance on lands administered by the BLM within any DWMA to 1 percent of the BLM-administered portion of the DWMA, and implementing grazing, recreation, and travel restrictions.

This vast area contains a variety of desert habitats that are still relatively undisturbed in most places. The dominant plant community in the area is creosote bush scrub, with creosote bush, burro weed, ocotillo, and brittle bush as the most conspicuous species. In the alluvial washes, the typical wash woodland includes mesquite, desert ironwood, smoke tree, palo verde, and desert willow (*Chilopsis linearis*). There are stands of the California fan palm (*Washingtonia filifera*) in several of the oases. At least two rare plants, a cactus, *Escobaria vivipara* var. *alversonii* and *Ditaxis californica*, occur in the Chuckwalla DWMA. Within the area, there is a wide variety of lower Sonoran animal life, and over 20 species of reptiles likely occur in the area. The desert bighorn sheep (*Ovis canadensis*) is found in the mountains.

Figure 3.4-5 shows where the Chuckwalla DWMA intersects with the Project location, and Figure 3.9-2 shows the Multiple Use Classes within the Project component location. According to Appendix A of the NECO Plan/EIS, the proposed Solar Farm site, portions of the Gen-Tie lines north of I-10, and the proposed Telecommunications Site are outside of the DWMA. These areas are listed as Category III habitat for desert tortoise and as a BLM moderate use class. Category III habitat is defined as areas that are not essential to maintenance of viable populations, that contain low to medium densities, and that are not contiguous with medium- or high-density areas and in which the population is stable or decreasing (BLM 1992). Red Bluff Substation A and portions of the Gen-Tie Lines south of I-10 are within the DWMA and Category I habitat for desert tortoise and are given a Limited Use designation. Category I habitat is defined as areas that are essential to maintenance of large viable populations, that contain medium to high densities or are contiguous with medium- to high-density areas, and in which the population is increasing, is stable, or is decreasing (BLM 1992).

Chuckwalla Critical Habitat Unit

Figure 3.4-5 also shows where the Chuckwalla *Critical Habitat Unit* (CHU) intersects with the Project locations and where the Chuckwalla CHU overlaps with the Chuckwalla DWMA. CHUs are specific legally defined areas that are essential for the conservation of the desert tortoise that support physical and biological features essential for desert tortoise survival, and that require special management considerations or protection. Critical habitat for the desert tortoise was designated by the USFWS in 1994, largely based on the proposed DWMAs in the draft Recovery Plan (USFWS 2008).

The Chuckwalla CHU is located generally south of I-10 and west of Kaiser Road (but not adjacent to it). Portions of all three Gen-Tie Lines intersect the CHU. The Red Bluff Substation B is not within the Chuckwalla CHU as it is located on private land.

3.5 CLIMATE CHANGE

Climate represents a statistical description of weather patterns averaged over periods ranging from several months (for seasonal descriptions) to several decades (for long-term climate patterns). Climate descriptions typically emphasize average, maximum, and minimum conditions for temperature and precipitation patterns, but also include wind, cloud cover, humidity, and sunlight intensity patterns.

Changes in climate conditions occur over a wide range of time scales. Climate change over time scales of tens of thousands to hundreds of thousands of years or longer are produced by natural factors such as:

- Continental drift and associated changes in ocean circulation patterns, with resulting changes to atmospheric circulation patterns and weather conditions;
- Continental uplift and tectonic activity forming mountain ranges and plateaus that alter atmospheric circulation patterns and weather conditions over land areas; and
- Variations in the shape of Earth's orbit around the sun and variations in the tilt of the Earth's axis, affecting the intensity of sunlight received at different locations.

Climate change over shorter time scales are produced by natural factors such as:

- Variations in the sun's output of solar radiation;
- Volcanic eruptions releasing large quantities of carbon dioxide (CO_2), sulfur compounds, and aerosols;
- Periodic changes in ocean circulation patterns and sea surface temperatures, which influence global weather patterns;
- Changes in the extent of snow and ice cover; and
- Other changes in land surface properties affecting the absorption and reflection of solar radiation.

Over the last few centuries, human activity has become a factor producing climate change through activities such as:

- Activities that generate CO_2, methane (CH_4), nitrous oxide (N_2O), and other greenhouse gas (GHG) emissions;
- Activities generating photochemical air pollutants, resulting in increases in ozone levels in the lower atmosphere;
- Activities that release chlorofluorcarbon compounds that result in depletion of stratospheric ozone;
- Activities generating solid and liquid aerosol air pollutants; and
- Changes in land surface properties affecting the absorption and reflection of solar radiation.

Greenhouse Gases

Greenhouse gases are compounds in the atmosphere that absorb infrared radiation and re-radiate a portion of that back toward the earth's surface, thus trapping heat and warming the earth's atmosphere. The most important naturally occurring GHG compounds are CO_2, CH_4, N_2O, ozone (O_3), and water vapor. CO_2, CH_4, and N_2O are produced naturally by respiration and other physiological processes of plants, animals, and microorganisms; by decomposition of organic matter; by volcanic and geothermal activity; by naturally occurring wildfires; and by natural chemical reactions in soil and water. Some O_3 is formed naturally from chemical reactions that occur when lightning ionizes oxygen and other atmospheric gases, but most O_3 forms during complex chemical reactions in the atmosphere among organic compounds and nitrogen oxides in the presence of ultraviolet radiation. O_3 is a strong GHG, but is also chemically very reactive. Consequently, high O_3 concentrations do not persist for long periods of time in the lower atmosphere. The short atmospheric residence time reduces the overall climate effects of O_3 in the lower atmosphere. While water vapor is a strong GHG, its concentration in the atmosphere is primarily a result of, not a cause of, changes in surface and lower atmospheric temperature conditions.

Although naturally present in the atmosphere, concentrations of CO_2, CH_4, and N_2O also are affected by emissions from industrial processes, transportation technology, urban development, agricultural practices, and other human activity. The Intergovernmental Panel on Climate Change (IPCC) and the National Oceanic and Atmospheric Administration (NOAA) estimate the following changes in global atmospheric concentrations of the most important GHGs (IPCC 2001, 2007; NOAA 2010):

- Atmospheric concentrations of CO_2 have risen from a pre-industrial background of 280 parts per million by volume (ppm) to 379 ppm in 2005 and to 386 ppm in 2009;
- Atmospheric concentrations of CH_4 have risen from a pre-industrial background of about 0.70 ppm to 1.774 ppm in 2005 and to 1.79 ppm in 2009; and
- Atmospheric concentrations of N_2O have risen from a pre-industrial background of 0.270 ppm to 0.319 ppm in 2005 and to 0.322 ppm in 2009.

The IPCC has concluded that these changes in atmospheric composition are almost entirely the result of human activity, not the result of changes in natural processes that produce or remove these gases (IPCC 2007).

CO_2, CH_4, and N_2O have atmospheric residence times ranging from about a decade to more than a century. Several other important GHG compounds with long atmospheric residence times are produced almost entirely by various industrial processes; these include sulfur hexafluoride (SF_6) and a wide range of fluorinated hydrocarbons. These fluorinated compounds typically have atmospheric residence times ranging from a few decades to thousands of years.

The overall global warming potential of GHG emissions is typically presented in terms of carbon dioxide equivalents (CO_2e), using equivalency factors developed by the IPCC. The IPCC has published sets of CO_2e factors as part of its periodic climate change assessment reports issued in 1995, 2001, and 2007. The latest IPCC data assign global warming potential multipliers of 1 to CO_2, 25 to CH_4, and 298 to N_2O (IPCC 2007). The global warming potential multiplier for sulfur

hexafluoride is 22,800; global warming potential multipliers for fluorinated hydrocarbons vary widely according to the specific compound.

CARB (2007a) has estimated that the 1990 level of GHG emissions in California was 470.7 million tons CO_2e. The estimated 2006 level of GHG emissions in California was 533.4 million tons CO_2e (CARB 2009a), a 13.3 percent increase over 1990 levels. As a comparison, EPA estimates that national GHG emissions in 2006 were 7.882 billion tons CO_2e (EPA 2009a). California thus accounted for 6.8 percent of overall US GHG emissions in 2006. National GHG emissions in 2006 represented a 17.2 percent increase from estimated 1990 national GHG emissions (6.723 billion tons CO_2e). CARB estimates that without implementation of programs to reduce GHG emissions, statewide GHG emissions in 2020 would be about 657 million tons CO_2e, a 39.6 percent increase from 1990 levels (CARB 2008).

Based on the GHG inventory for 2006 (CARB 2009a), the major sources of GHG emissions in California are:

- Fuel combustion for motor vehicle, aircraft, rail, and commercial vessel transportation (38.4%);
- Industrial facility operations and fuel use (22.8%);
- Fuel combustion for electricity generation, both in-state and imported (22.1%);
- Fuel use in residential buildings (6.4%);
- Agricultural and forestry operations (6.3%);
- Fuel use in commercial buildings (2.7%); and
- Recycling and waste management (1.3%).

3.5.1 Regulatory Framework

State and Federal Climate Change Programs

The US Department of the Interior (DOI) has established general policies related to renewable energy development and climate change. In 2001, Secretary Order 3226 established a requirement that each bureau or office within the DOI should consider and analyze potential climate change impacts when undertaking long-range planning, developing multiyear management plans, making major decisions on using resources under the DOI's purview, or setting priorities for scientific research and investigation. In March 2009, Secretary Order 3285 set a policy that encouraging the production, development, and delivery of renewable energy would be one of the DOI's highest priorities. In September 2009, Secretary Order 3289 reaffirmed the provisions of Secretary Order 3226 and established a DOI Carbon Storage Project to develop methods for geological and biological carbon storage. In February 2010, Secretary Order 3289 was replaced with Secretary Order 3289, Amendment 1, which made minor editorial changes to the original order.

The EPA adopted a federal GHG mandatory reporting program in October 2009. The federal GHG mandatory reporting threshold is 27,558 tons (25,000 metric tons) per year CO_2e for 31 categories of stationary emission sources (EPA 2009b). GHG reporting for additional categories of stationary sources may be addressed by future regulations. Electrical power transmission and distribution systems is one of the source categories that remains under review for future federal GHG reporting

requirements. Electrical transformers, switchgear, circuit breakers, gas-insulated substations, and gas-insulated transmission lines are a source of sulfur hexafluoride and fluorinated hydrocarbon emissions (mostly from equipment and storage container leaks or from spills and leaks during recharging of insulating gases).

California began efforts to address GHG issues at a state level in 1988 when the California Energy Commission (CEC) was directed to develop a statewide inventory of GHG emission sources. The California Climate Action Registry was established in 2000 to allow companies and government agencies to voluntarily record their GHG emissions in a database, in anticipation of possible future regulations that might allow credit for early GHG emission reductions. In 2002, Assembly Bill (AB) 1493 directed CARB to develop regulations to reduce GHG emissions from vehicles sold in California. In 2005, Governor Schwarzenegger issued Executive Order S-3-05, which sets the following target dates for reducing statewide GHG emissions:

- Reduce GHG emissions to 2000 levels by 2010;
- Reduce GHG emissions to 1990 levels by 2020; and
- Reduce GHG emissions to 80 percent below 1990 levels by 2050.

In 2006, Senate Bill (SB) 1368 created GHG performance standards for new long-term financial investments in base-load electricity generation facilities serving California customers. Also in 2006, California passed AB 32 (the California Global Warming Solutions Act of 2006; California Health and Safety Code Division 25.5, Sections 38500, et seq.), which requires CARB to design and implement regulations, emission limits, and other measures to reduce statewide GHG emissions to 1990 levels by 2020.

The California Global Warming Solutions Act of 2006 (AB 32) established the following timetable for specific CARB actions:

- Publish a list of discrete early action GHG emission reduction measures by June 30, 2007.
- Establish a statewide GHG emissions cap for 2020 (equivalent to the 1990 emissions level) by January 1, 2008.
- Adopt mandatory reporting rules for significant sources of GHGs by January 1, 2008.
- Adopt a scoping plan by January 1, 2009, indicating how GHG emission reductions will be achieved from significant GHG sources via regulations, market-based compliance mechanisms and other actions, including identification of a de minimis threshold for GHG emissions, below which emission reduction requirements would not apply.
- Adopt regulations by January 1, 2011 to achieve the maximum technologically feasible and cost-effective reductions in GHGs, including provisions for using both market-based and alternative compliance mechanisms.
- Establish January 1, 2012 as the date by which all regulations adopted prior to January 1, 2010 are to become operative (enforceable).
- The goals of the California Global Warming Solutions Act of 2006 are to halt the growth in annual GHG emissions and to reduce GHG emissions to the 1990 level by 2020. Achieving

the 2020 goal would represent a 12 percent reduction in statewide GHG emissions from 2006 levels and a 28 percent reduction from projected 2020 "business as usual" emission levels.

In 2007, CARB adopted regulations requiring mandatory annual reporting of GHG emissions from the following categories of industrial emission sources:

- Cement manufacturing plants;
- Electric generating plants, retail providers, and power marketers;
- Cogeneration facilities;
- Petroleum refineries, hydrogen plants, and combustion from oil and gas production; and
- General stationary source fuel combustion.

The GHG reporting requirements (CARB 2008c) establish a reporting threshold of 27,558 tons (25,000 metric tons) per year of CO_2 emissions for industrial facilities other than power generation and cogeneration facilities. The emission reporting threshold for power generation and cogeneration facilities is 2,756 tons (2,500 metric tons) per year of CO_2. Power generation and cogeneration facilities with a capacity of less than 1 megawatt, backup and emergency generators, portable equipment, primary and secondary schools, and most hospitals are exempt from the reporting requirements. While the CARB mandatory GHG reporting regulation requires the reporting of all major GHG emissions, the thresholds for requiring the reports are based on CO_2 emissions only, not total CO_2e from all GHG emissions. GHG emissions from vehicle fleets also are excluded from the mandatory reporting requirements, but the regulation provides for voluntary reporting of those emissions. Non-exempt facilities with annual CO_2 emissions below the relevant de minimis thresholds are not required to report their annual GHG emissions. All facilities subject to the regulation must submit annual GHG emission reports. In addition, depending on type and size of facility, independent verification of annual GHG emission reports must be submitted either annually or every third year.

CARB adopted the climate change scoping plan mandated by AB 32 in December 2008 (CARB 2008b). Key elements of the plan include:

- Expanding and strengthening energy efficiency programs, building energy efficiency standards, and appliance energy efficiency standards;
- Achieving a renewables energy mix of 33 percent for statewide electrical power generation;
- Developing a California cap-and-trade program coordinated with other western states to limit industrial GHG emissions;
- Establishing targets for transportation-related GHG emissions by region throughout California and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures such as California's clean car standards, the low carbon fuel standards, and goods movement measures; and
- Creating targeted fees such as a public goods charge on water use, fees on the use of high global warming potential gases, and a fee to fund the administrative costs of implementing AB32 programs.

In 2008, SB 375 was adopted to provide a process for regional and local planning efforts to achieve GHG emission reductions through land use and transportation planning programs. SB375 requires coordination between the regional transportation planning process and the regional housing needs assessment process. SB375 also modifies the regional housing needs assessment process timelines to be consistent with timelines for regional transportation planning. Under SB375, CARB will establish transportation-related regional GHG emission reduction targets to be considered in regional transportation planning programs. The regional GHG emission reduction targets are planning goals, not mandatory requirements. Regional planning organizations will be responsible for working with local governments to identify a "sustainable communities strategy" that is based on current planning assumptions, is consistent with federal Clean Air Act requirements, and will help achieve regional GHG emission reduction targets.

Greenhouse Gas Reduction Strategies

Combustion of fossil fuels accounts for most GHG emissions, both in California and nationally. Additional GHG emissions are produced directly by industrial, agricultural, and waste management activities. The importance of fossil fuel combustion as a source of GHG emissions means that energy conservation and fuel economy measures have a major role in reducing GHG emissions. Most potential GHG reduction measures can be grouped into the following general categories:

- GHG emission standards for mobile sources;
- Improved fuel economy for mobile sources;
- Increased use of non-combustion sources for electrical power generation;
- Reduced electrical use in residential, commercial, and industrial buildings;
- Reduced fossil fuel use in residential, commercial, and industrial buildings;
- Land use and transportation programs to reduce vehicle trips and vehicle miles traveled (VMT);
- GHG emission reductions from stationary fuel combustion sources;
- GHG emission reductions from non-combustion sources in industrial operations;
- Development of substitutes for industrial uses of sulfur hexafluoride and fluorinated hydrocarbons;
- Reduced use of nitrogen fertilizers in agriculture and landscape maintenance;
- Improved CH_4 recovery at landfills and wastewater treatment plants; and
- CH_4 recovery at feedlots, dairies, and other livestock operations.

As noted previously, electrical power generation represents an important industrial source of GHG emissions (22 percent of California's GHG emissions). The CEC and the CPUC have implemented two programs focused specifically on generators and retailers of electrical power.

In 2002, SB 1078 established targets for renewable energy use by public and investor-owned utilities in California. The following types of power sources qualify as renewable energy sources under the Renewables Portfolio Standards (RPS) Program:

- Geothermal;
- Wind;
- Solar thermal;
- Photovoltaic solar;
- Small hydroelectric (under 30 megawatts);
- Efficiency improvements for large hydroelectric;
- Conduit hydroelectric;
- Ocean wave;
- Tidal currents;
- Ocean thermal;
- Biomass;
- Digester gas;
- Landfill gas;
- Municipal solid waste; and
- Biodiesel.

The California RPS Program sets fixed performance standards for investor-owned utilities in California and allows publicly owned utilities to set their own standards and target deadlines. The initial RPS target for investor-owned utilities was 20 percent renewable power generation by 2017. In 2006, SB 107 revised the target date for the 20 percent standard to 2010. As noted previously, the CARB climate change scoping plan adopted in 2008 calls for a statewide renewable energy mix of 33 percent by 2020.

In 2006, SB 1368 established an additional program to limit utility industry investments in power generation sources that have high emissions of GHGs. The SB 1368 program establishes emission performance standards (EPS) for utility investments in baseload power generation facilities. The current EPS is 1,100 pounds of CO_2 per megawatt-hour of energy generation. Utility investments subject to the EPS limitation include:

- Construction or purchase of new power plants designed and intended for baseload power generation;
- Purchase of existing power plants that are designed and intended for baseload power generation (combined-cycle natural gas power plants that were in operation or permitted before June 30, 2007, are exempt from this requirement);
- Ownership of shares in existing power plants that are designed and intended for baseload power generation (combined-cycle natural gas power plants that were in operation or permitted before June 30, 2007, are exempt from this requirement);
- Capital investment in existing utility-owned power plants that are designed and intended for baseload power generation if that investment would:

- Increase generation capacity by 50 megawatts or more at a combined-cycle natural gas power plant that was permitted before June 30, 2007;
- Extend the life of one or more units at other power plants by five years or more;
- Increase the rated capacity of other power plants; or
- Convert a non-baseload power plant into a baseload power plant.

Table 3.5-1 summarizes the current power generation mixes for SCE and PG&E.

Table 3.5-1
2009 Power Generation Mix for Southern California Edison and Pacific Gas and Electric

Type of Power Plant	Percent of SCE Power Generation Mix	Percent of PG&E Power Generation Mix
Coal	10.0%	2.0%
Large Hydroelectric	5.0%	15.8%
Natural Gas	50.7%	46.3%
Nuclear	17.9%	19.7%
Biomass/Waste	2.0%	3.9%
Geothermal	9.0%	3.9%
Small Hydroelectric	1.0%	3.9%
Solar	1.0%	0.5%
Wind	3.0%	3.0%
Other	0.5%	1.0%
Percent Renewable Power	**16.4%**	**16.3%**

Sources: SEC 2009; PG&E 2009

As of 2009, neither SCE nor PG&E had met the 2010 RPS target of 20 percent.

3.5.2 Existing Conditions

Climate

Climate conditions in the Desert Center area are characterized by moderate winter temperatures, hot summer temperatures, and low rainfall totals. Rainfall events are infrequent, averaging about 20 days with measurable precipitation each year. While rainfall events occur more often in winter than in other seasons, summer thunderstorms can produce the most significant rainfall events. April, May, and June are the months with the lowest average rainfall, and August is the month with the highest average rainfall. The Eagle Mountain weather station (located 2.75 miles west of the solar farm site near the Metropolitan Water District Eagle Mountain pump station) records temperature and precipitation data. Blythe Airport (42 miles east-southeast of the solar farm site) appears to be the next closest location with representative weather data. In addition to temperature and precipitation data, Blythe Airport provides limited wind data.

Table 3.5-2 summarizes monthly average temperature and precipitation data from the Eagle Mountain weather station. Table 3.5-3 summarizes monthly average temperature, precipitation, and wind speed data from Blythe Airport.

Table 3.5-2
Monthly Average Weather Conditions (1971-2000) for Eagle Mountain Weather Station

Month	Maximum Temp, degrees F	Minimum Temp, degrees F	Average Precipitation, inches	Days with Precipitation Equal to or Exceeding	
				0.01 Inches	0.10 Inches
January	64.8	45.4	0.58	3.2	1.4
February	69.4	49.1	0.53	2.7	1.4
March	74.9	53.5	0.50	2.6	1.4
April	82.4	60.1	0.08	1.0	0.2
May	90.3	68.0	0.08	0.7	0.2
June	100.2	77.1	0.06	0.3	0.1
July	104.1	82.6	0.44	1.1	0.5
August	102.8	81,1	0.82	2.5	1.4
September	97.2	75.2	0.47	1.5	0.8
October	86.1	64.2	0.24	1.3	0.6
November	73.3	52.6	0.18	0.9	0.6
December	65.1	45.5	0.43	1.8	1.1
Annual Average or Total	**84.2**	**62.9**	**4.41**	**19.6**	**9.7**

Source: National Climatic Data Center 2004b

Table 3.5-3
Monthly Average Weather Conditions (1971-2000) for Blythe Airport

Month	Maximum Temp, degrees F	Minimum Temp, degrees F	Average Precipitation, inches	Days with Measurable Precipitation	Average Wind Speed, mph
January	66.6	41.7	0.46	3/0	6.6
February	72.0	45.7	0.55	2.8	7.2
March	77.6	50.2	0.45	2.7	7.8
April	85.7	56.2	0.14	1.1	9.3
May	93.9	63.9	0.03	0.5	8.9
June	104.1	72.6	0.01	0.2	9.4
July	107.2	80.2	0.32	1.6	9.6
August	105.4	79.5	0.66	2.0	8.7
September	99.6	72.4	0.50	1.5	7.5
October	88.0	60.0	0.23	1.3	6.8
November	74.7	47.4	0.19	1.2	6.1
December	66.0	40.9	0.48	2.2	6.7
Annual Average or Total	**86.7**	**59.2**	**4.02**	**20.1**	**7.9**

Wind speed data are for 1996-2006.
Sources: National Climatic Data Center 2004a; Western Regional Climate Center 2007

Detailed wind direction data from Blythe Airport are not readily available, but seasonal time-of-day wind roses for Blythe Airport are available (Stewart 1999). Despite differences in the height and orientation of nearby topographic features, the wind rose data for Blythe Airport provide a reasonable indication of dominant wind directions for the proposed Project area. Overall, the predominant wind directions are from the north, south, and southwest. Northerly winds are more common in the fall and winter, and southerly winds are more common in the spring and summer. Table 3.5-4 summarizes seasonal wind direction data from Blythe Airport.

Table 3.5-4
Seasonal Wind Directions at Blythe Airport, 1997-2001

Season	Period of Day	Dominant Wind Directions	Directions for Winds 17 mph or Stronger
Winter	Morning	N, W, S	N, SW
	Afternoon	N, S	N, SW, S
	Evening	N, S, SW	N, W, SW
	Overnight	N, W	N, NW, SW
Spring	Morning	S, N	N, SW, S
	Afternoon	S	SW, N, S
	Evening	S, SW	SW, N, S
	Overnight	S, N	N, W, SW
Summer	Morning	S, N	S, N
	Afternoon	S	S, SW, SE
	Evening	S, SW	SE, SW, NW
	Overnight	S, SW	SE, S, N
Fall	Morning	N, SW, W	N, S, SW,
	Afternoon	N, S, SE,	SW, N, E, S
	Evening	S, SE, N	W, N, SW
	Overnight	N, W, SW	N, NW, S

Source: Stewart 1999

Existing Greenhouse Gas Emissions

Statewide emissions of GHG from relevant source categories in 1990 and later years are summarized in Table 3.5-5. Specific contributions from air basins such as MDAB are not currently specified as part of the state inventory. Emissions of CO_2 occur largely from combustion of fossil fuels. The major categories of fossil fuel combustion CO_2 sources can be broken into sectors for residential, commercial, industrial, transportation, and electricity generation. Other GHG emissions, such as CH_4 and N_2O, are also tracked by state inventories but occur in much smaller quantities.

Table 3.5-5
California Greenhouse Gas Emissions (MMTCO2e)

Emission Inventory Category	***1990***	***2000***	***2001***	***2002***	***2003***	***2004***	**2005**
Residential Fuel Combustion (CO_2)	*29.7*	*30.25*	*27.21*	*27.32*	*26.40*	*27.86*	--
Commercial Fuel Combustion (CO_2)	*14.4*	*15.63*	*12.04*	*17.84*	*15.06*	*12.1*	--
Industrial Fuel Combustion (CO_2)	*103.0*	*76.17*	*80.48*	*71.53*	*65.47*	*67.2*	--
Transportation Fuel Combustion (CO_2)	*150.7*	*181.68*	*182.49*	*190.19*	*180.64*	*187.95*	--
Electricity Generation, in-State (CO_2)	*49.0*	*55.87*	*61.35*	*47.78*	*45.92*	*55.10*	*49.0*
Methane (all CH_4 shown as CO_2e)	--	*26.32*	*26.62*	*27.07*	*27.49*	*27.80*	--
Nitrous Oxide (all N_2O shown as CO_2e)	--	*31.43*	*30.76*	*34.48*	*33.85*	*33.34*	--
Electricity Transmission and Distribution (SF_6 shown as CO_2e)	*2.6*	*1.14*	*1.10*	*1.04*	*1.01*	*1.02*	--
Total California GHG Emissions without Electricity Imports	***371.1***	***440.47***	***446.35***	***444.86***	***423.20***	***439.19***	**--**
Electricity Imports (CO_2e)	*61.6*	*40.48*	*47.37*	*51.73*	*56.44*	*60.81*	--
Total California GHG Emissions with Electricity Imports	***433.29***	***480.94***	***493.72***	***496.59***	***479.64***	***500.00***	**--**

Source: CPUC 2008

Potential Effects of Climate Change

In November 2004, the California Climate Action Team (CAT) was formed to assist CARB with the Climate Change Scoping Plan. The CAT consisted of 14 agencies and 11 subgroups According to the 2006 California CAT Report, the following climate change effects, based on the IPCC trends, can be expected in California over the next century:

1. *A diminishing Sierra snowpack, declining by 70 to 90 percent, threatening the State's water supply;*
2. *Increasing temperatures from 0.5 °F to 5.8 °F under the higher emission scenarios, leading to a 25 percent to 35 percent increase in the number of days ozone pollution levels are exceeded in most urban areas;*
3. *Increased vulnerability of forests as a result of pest infestation and increased temperatures; and*
4. *Increased electricity demand, particularly in the hot summer months.*

Ecosystem Carbon Storage

Several comments received during the scoping process for this EIS requested that the EIS address the impact of the Solar Farm on carbon storage in desert soils. The following discussion provides a background for such analyses.

Most of the carbon found in organic matter is ultimately derived from CO_2 removed from the atmosphere by growing plants. Thus living organisms and organic matter in the soil represent a GHG (CO_2) that has been temporarily removed from the atmosphere. In addition to carbon stored in organic matter, atmospheric CO_2 can be stored in soils as carbonate minerals formed by chemical or biochemical reactions between CO_2 and calcium or magnesium oxide. The carbon stored in organic matter can be released back into the atmosphere by combustion (wildfires or use of organic matter as fuel); decay of organic matter; and respiration by plants, animals, and microorganism. Carbon stored in carbonate minerals can also be released back into the atmosphere by various chemical reactions.

Long term storage of carbon in terrestrial ecosystems occurs through one of three mechanisms:

- Long term, ongoing increases in biomass (primarily in vegetation biomass);
- Long term, ongoing increases in soil organic matter content; or
- Long-term, ongoing increases in mineralized carbon compounds, primarily as carbonate minerals in the soil.

Desert areas have low vegetation and animal biomass (combined aboveground and below ground), limited quantities of organic litter on the soil surface, and low soil organic matter contents (Oak Ridge National Laboratory 1998a, 1998b; University of Edinburgh, no date). Consequently, desert ecosystems have a low capacity for organic matter carbon storage that could buffer climate change effects due to increasing GHG concentrations.

Some older literature references state that desert soils have an organic carbon storage level comparable to temperate forest soils, but such statements are clearly incorrect. These faulty evaluations of desert soil carbon storage are usually based on two soil carbon databases from the mid-1980s that incorrectly assigned non-desert soil samples to desert vegetation communities or that

selectively sampled only atypical areas where soils had high moisture levels and potential for agricultural development (Adams et. al., 1998). More recent evaluations of terrestrial carbon sinks recognize the low organic carbon storage potential of desert soils (Hurtt et. al., 2002). The US Climate Change Science Program (2007) identifies the major carbon sinks in North America as net forest growth, net accumulation of wood products, encroachment of trees and woody vegetation into grasslands, net changes in cropland management to increase soil organic matter, net accumulation of organic matter in wetlands, organic sediment accumulation in rivers and reservoirs, net international exports of wood and agricultural products, and river transport of organic sediments to the oceans. Desert ecosystems are not mentioned in this report on carbon sources and sinks in the US, Canada, and Mexico.

A few recent studies (such as Wohlfahrt, et. al., 2008) claim that desert ecosystems may rival temperate forests or grasslands as a potential source of carbon storage. These studies, however, have not made any direct measurements of net increases in carbon storage in desert ecosystems. Instead, they have used complex indirect calculation procedures to estimate time histories of CO_2 uptake and release derived from instrumented tower measurements of atmospheric CO_2 concentrations and meteorological data using procedures called eddy covariance techniques. These procedures are widely recognized as being technically difficult and subject to considerable uncertainty.

The Wohlfahrt, et al. (2008) study was conducted over a 2-year period (2005 and 2006) at a site north of Las Vegas, Nevada. The study area was dominated by creosote bush, burro bush, boxthorn, and perennial grasses, with a canopy coverage of about 18 percent. Based on that description, the vegetation at the Nevada study site appears to be generally similar to that found at the proposed Desert Sunlight Solar Farm site. The study estimated net annual uptake rates of 910 pounds of carbon per acre per year in 2005 and 981 pounds of carbon per acre per year in 2006. The study authors estimated the uncertainty of their measurements as plus or minus about 65 percent of the mean annual carbon uptake values. The carbon content of vegetation is typically 45 percent to 50 percent of dry biomass weight. Desert and semi-desert shrub ecosystems typically have an above ground plant biomass equivalent to about 2,944 pounds of carbon per acre (Oak Ridge National Laboratory 1998b). No measurements of above ground or below-ground biomass were undertaken during the Wohlfahrt et al. (2008) study. The study authors did not note any significant change in vegetation cover during the two-year study, and thus concluded that net increases in vegetation could account for no more than a small part of the estimated ecosystem carbon uptake. The study authors instead suggested that net increases in soil biological crust biomass was the likely source of the estimated annual net carbon uptake. The annual carbon uptake rates estimated by Wohlfahrt, et al. (2008) are equivalent to about 1,900 pounds per acre dry weight of biomass in 2005 and 2,050 pounds per acre dry weight of biomass in 2006. The implied biomass increases over the two years of the study would be about two-thirds of the baseline standing biomass of shrub vegetation at the site. *However, a reasonably plausible process in which net annual carbon uptake is incorporated into biological soil crusts was not included in the study.*

A news review (Stone 2008) noted suggestions from a similar study in China that the estimated carbon storage was occurring as mineralized carbon in the soil rather than as biomass increases. Other researchers interviewed for the news review were dubious about the results reported in both the China study and in Wohlfahrt, et al. (2008).

The recognized mechanisms for carbonate mineral accumulation in soils include chemical formation through the weathering of silicate and oxide minerals, wet deposition of calcium carbonate dissolved in precipitation, and dry deposition of atmospheric dust particles rich in calcium carbonate (McAuliffe 2000). Non-biological mechanisms for CO_2 transport from the atmosphere to soils are dominated by formation of carbonic acid as CO_2 dissolves in water. Precipitation amounts in desert ecosystems are far too low to provide an important mechanism for CO_2 removal from the atmosphere. While carbonic acid in precipitation plays a role in the chemical reactions that occur during weathering of silicate and oxide minerals in rocks, the process is extremely slow. In addition, carbonic acid dissolves calcium carbonate, leaching it to deeper layers in the soil or into groundwater systems. This process keeps calcium carbonate from accumulating in upper soil layers in regions that receive abundant precipitation. Relatively high levels of calcium carbonate are common in desert soils because there is insufficient precipitation to dissolve and leach carbonate minerals from surface soils.

If the carbon uptake estimates made by Wohlfahrt, et al. (2008) occurred as mineralization of atmospheric CO_2 to calcium carbonate, the estimated carbon uptake rates would have added 7,583 pounds of calcium carbonate per acre during 2005 and 8,178 pounds of calcium carbonate per acre during 2006. Such rapid accumulations of calcium carbonate in soils would quickly cement the soils and make them unsuitable for the growth of many, if not most, desert plant species.

Without corroboration from direct measurements of increased carbon storage in vegetation or soils, carbon flux estimates such as those reported by Wohlfahrt et al. (2008) are not considered reliable enough to use as the basis for identifying desert soils (including soils in the Project area) as a source for carbon storage. This issue is not discussed further.

3.6 CULTURAL RESOURCES

Cultural resources are locations of human activity, occupation, or use. They include expressions of human culture and history in the physical environment, such as archaeological sites, buildings, structures, objects, districts, or other places. Cultural resources also include places that are considered to be of traditional cultural or religious importance to social or cultural groups.

Prehistoric resources are recognized as those attributed to Native American groups who occupied the region before contact with Europeans; historic resources are those associated primarily with Europeans and Americans but also include resources of Native Americans following contact. These resources are more than 50 years old but date to after the time of contact between Native Americans and Europeans. Although a few explorers traversed the region earlier, in California the time of contact between Native Americans and Europeans is generally identified as the 1770s.

Ethnographic resources are those sites that were in use at the time of Spanish exploration and later settlement of the area, while ethnohistoric resources are those areas used by Native Americans following exploration and settlement by non-Native Americans. Sites or artifacts of particular significance to modern Native Americans are often kept secret by those groups to protect the sites from disturbance, looting, overuse, or other damage. Ceremonial sites or objects, burials and associated funerary objects, or places referred to in traditional oral histories are often considered sacred to these groups.

Sacred sites and other places of traditional cultural importance, sometimes called traditional cultural properties (TCPs), are associated with the cultural practices or beliefs of a living community. *Traditional cultural properties* are rooted in the community's history and are important in maintaining cultural identity. Such places may be eligible for the National Register of Historic Places (NRHP). Examples of TCPs for Native American communities include natural landscape features, trail systems, places used for ceremonies and worship, places where plants are gathered that are used in traditional medicines and ceremonies, places where artisan materials are found, and places and features of traditional subsistence systems, such as hunting areas.

Several cultural resource studies have been completed in support of this EIS. These include a Class I cultural resources inventory (ECORP 2009a), a cultural resource survey and monitoring effort associated with geotechnical testing (ECORP 2009b); a geoarchaeological survey of the preferred Solar Farm area (ECORP 2010a); and a Class III field survey of all Project components and alternative areas (ECORP 2010b). In addition, the BLM has initiated consultation with Indian tribes to identify traditional resources that may otherwise be left unidentified by these studies. These documents and consultation letters are included in Appendix K.

Based on the above studies and efforts, *a Region of Influence* (ROI) for this cultural resources analysis has been defined. *The ROI is equivalent to the Area of Potential Effects (APE) as defined in Title 36 CFR Part 800.16(d), the regulations implementing the National Historic Preservation Act of 1966.* The ROI includes the areas described in the categories below (ECORP 2010b). Specific cultural resources listed here are described in the Identified Cultural Resources subsection of Section 3.6.2.

1. All areas where physical Project activities would occur, including the full extent of all Project components and alternatives. These include:

a. Solar Farm Sites B and C;

b. Gen-Tie Lines GT-A-1, GT-A-2, and GT-B-2;

c. Red Bluff Substations A and B (including drainage features);

d. SCE Red Bluff Distribution Line (associated with Substation A);

e. Access Road 1 (via Kaiser Road and Aztec Road) and Access Road 2 (via Chuckwalla Valley Road and Corn Springs Road) alternatives (including drainage features) for Substation A;

f. Access Road for Substation B (via Eagle Mountain Road and including drainage features); and

g. Telecommunications Site and Associated Distribution Line.

2. The full boundary, in depth and horizontal extent, of any cultural resources identified within or partially within any of the areas described above under Part 1.

3. Individual cultural resources not within the areas described above under Part 1 that could sustain direct or indirect nonphysical effects, including visual, auditory, and atmospheric effects, as a result of the Project. These include:

    a. Cultural resources identified through the Class I inventory. Specific cultural resources that were identified are:

        i. The NRHP-listed North Chuckwalla Mountains Quarry Archaeological District (CA-RIV-1814),

        ii. The NRHP-eligible prehistoric site CA-RIV-330, and

        iii. The NRHP-listed North Chuckwalla Mountains Petroglyph District (CA-RIV-1383).

    b. Elements of the Built Environment whose viewsheds encompass the study area. Specific resources identified are:

        i. Colorado River Aqueduct,

        ii. Eagle Mountain Pumping Station, and

        iii. Eagle Mountain Mine.

4. Any cultural resource or location that has been included in the Native American Heritage Commission Sacred Lands Files or that may be identified by an Indian tribe, tribal organization, or individual through consultation as having religious or cultural significance. No specific resources or areas of concern have been identified to date.

5. Any cultural resource or location that may be identified by a consulting party, organization, governmental entity, or individual through consultation or the public commenting processes as having significance or being a resource of concern. No specific resources or areas of concern have been identified to date.

6. Historic Districts and Landscapes that include all or portions of any of the Project components listed under Part 1. These are:

a. The Desert Training Center California-Arizona Maneuver Area (DTC/C-AMA), which encompasses the entire Project Study Area,

b. The Colorado River Aqueduct,

c. The NRHP-listed North Chuckwalla Mountains Petroglyph District (CA-RIV-1383),

d. The NRHP-listed North Chuckwalla Mountains Quarry Archaeological District (CA-RIV-1814), and

e. The NRHP-eligible prehistoric site CA-RIV-330.

3.6.1 Applicable Plans, Policies, and Regulations

Federal

There are numerous federal regulations, executive orders, and policies that direct management of cultural resources on federal lands and by federal agencies. These include the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act, the Native American Graves Protection and Repatriation Act (NAGPRA), the American Indian Religious Freedom Act *(AIRFA), Executive Order 13007*, and the Antiquities Act. The following is a discussion of the most pertinent laws affecting the proposed Project and the impact analysis included in the EIS.

The material expressions of past human activities and the types of areas used by people vary across the region, where cultural resources are managed in accordance with laws, regulations, and guidelines. The principal federal law addressing cultural resources is the NHPA of 1966, as amended (16 United States Code [USC], Section 470), and its implementing regulations (36 Code of Federal Regulations [CFR], Part 800), that primarily address compliance with Section 106 of the act. The regulations describe the process for identifying and evaluating historic properties, for assessing the effects of federal actions on historic properties, and for consulting with interested parties, including the State Historic Preservation Office (SHPO) and Indian tribes, to develop measures that would avoid, reduce, or minimize adverse effects. The term "historic properties" refers to cultural resources that *are listed on, or meet specific criteria of eligibility for listing on, the NRHP*.

In order to be eligible for the NRHP, cultural resources must be at least 50 years old (generally), have integrity, and meet at least one of the four criteria listed below. Integrity is the property's ability to convey its demonstrated historical significance through location, design, setting, materials, workmanship, feeling, and association. There are also considerations for resources that may have achieved national significance but are fewer than 50 years old. Criteria for listing on the NRHP (36 CFR, 60.4) are as follows:

A. Association with events that have made a significant contribution to the broad patterns of our history;

B. Association with the lives of persons significant to our past;

C. Resources that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. Resources that have yielded or may be likely to yield information important in prehistory or history.

Section 106 of the NHPA describes the procedures for identifying and evaluating eligible properties, for assessing the effects of federal actions on eligible properties, and for consulting to avoid, reduce, or minimize adverse effects. Eligible properties need not be formally listed on the NRHP. As part of the Section 106 process, agencies are required to consult with the SHPO. Section 106 does not require the preservation of historic properties, but it ensures that the decisions of federal agencies concerning the treatment of these places result from meaningful considerations of cultural and historic values and of the options available to protect the properties. The proposed action is an undertaking, as defined by 36 CFR 800.3, and is subject to Section 106 and consideration under other federal requirements.

Directives for land use planning in the BLM Land Use Planning Manual H-1601-1 and BLM Manual Sections 8110.4 and 8130 require categorizing known and suspected cultural resources according to their nature and relative preservation value. Resource types are allocated to appropriate use categories that include scientific use, conservation for future use, traditional use, public use, and experimental use or those resources discharged from management. These directives also require identifying priority geographic areas for new field inventory or protective measures. These decisions would be based on a probability for unrecorded significant resources, imminent threats from natural or human-caused deterioration, or potential conflict with other resource uses.

The BLM also complies with the NHPA through a National Programmatic Agreement (NPA) and, in California, a 2007 State Protocol Agreement. The protocol supplements the NPA with unique requirements for managing cultural resources on public lands in California and is used as the primary management guidance by BLM offices in the state for complying with the NHPA. This protocol allows BLM's cultural resource staff to act on the SHPO's behalf under limited circumstances. The BLM may define APEs and the required level of inventory efforts and may determine NRHP eligibility and the effects of undertakings without consulting with the SHPO. However, when undertakings are found to affect historic properties under Section 106 of the NHPA, consultation with SHPO under 36 CFR 800, and the BLM Manual 8100 series is required.

A Memorandum of Agreement is being developed for this Project for the purpose of NHPA compliance. The Memorandum of Agreement would be among the BLM, SHPO, CPUC, SCE, Desert Sunlight Holdings, LLC, and interested Indian tribes the BLM is consulting. The Advisory Council on Historic Preservation would be invited to participate in the Memorandum of Agreement. (A draft of the Memorandum of Agreement is included in Appendix K.) The Memorandum of Agreement will include a list of historic properties located within the APE, require that a Historic Property Treatment Plan be developed and implemented prior to the issuance of a Notice to Proceed, provide for review by interested parties of draft documents resulting from implementation of the Historic Property Treatment Plan, provide for the management of unanticipated discoveries of cultural resources, address treatment of Native American human remains, and include reporting requirements. NRHP eligibility evaluations and treatment of historic properties would be carried out before Project construction. Once the *Memorandum of Agreement* is signed, which will be before the Record of Decision (ROD) for this EIS is signed, compliance with Section 106 of the NHPA will be considered complete.

AIRFA establishes a policy of federal protection for traditional American Indian religious freedoms. It seeks to correct federal policies and practices that could (a) deny access to sacred sites required in traditional religions, (b) prohibit use

and possession of sacred objects necessary for religious ceremonies, and (c) intrude upon or interfere with religious ceremonies. The BLM complies with AIRFA by obtaining and considering the views of traditional religious practitioners as part of the NEPA compliance process.

Executive Order 13007 directs federal agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners. It requires federal agencies to avoid adversely affecting the physical integrity of sacred sites to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions. EO 13007 reinforces the purposes expressed in AIRFA. The BLM complies with EO 13007 by consulting with tribal governments and Indian religious practitioners as part of the NEPA compliance process.

Requirements for responding to discoveries of Native American human remains and associated funerary objects on federal land are addressed under the NAGPRA (Public Law 101-601) and its implementing regulations found at Title 43 CFR Part 10. On public lands within the Project area, the BLM will comply with the law and regulations by determining lineal descendants and culturally affiliated Indian tribes and by carrying out appropriate treatment and disposition of the discovered remains, including transfer of custody.

The BLM is also required to consider impacts on Indian trust assets, which are lands, natural resources, money, or other assets held by the federal government in trust or that are restricted against alienation for Indian tribes and individual Indians. Trust responsibilities for the BLM are found in Department of the Interior Secretarial Order No. 3215 (Principles for the Discharge of the Secretary's Trust Responsibility), Departmental Manual Part 512, Chapter 2 (Departmental Responsibilities for Indian Trust Resources), and BLM Manual H-8120-1. However, because no Indian trust assets are within or near the Project area, this resource is not analyzed here.

State

There are numerous state regulations and policies that direct management of cultural resources on state lands and by state agencies. The following is a discussion of the most pertinent laws affecting the proposed Project and impact analysis from a state perspective.

Under CEQA, cultural resources listed in, or determined to be eligible for listing in, the California Register of Historical Resources (CRHR) or a local register meet the CEQA definition of "historical resources" and must be given consideration in the CEQA process. For this EIS, effects on historical resources may be considered impacts of the Project. Under CCR, Title 14, Chapter 11.5, properties listed on or formally determined to be eligible for listing in the NRHP are automatically eligible for listing in the CRHR. A resource is generally considered to be historically significant under CEQA if it meets the criteria for listing in the CRHR.

A resource is considered eligible for inclusion in the CRHR, and therefore a historical resource under CEQA, if it is at least 50 years old and meets at least one of the CRHR eligibility criteria, or it can be demonstrated that sufficient time has passed to understand its historical importance. Similar to the NRHP, the criteria for CRHR eligibility are as follows:

1. An association with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.
2. An association with the lives of persons important to local, California, or national history.

3. An embodiment of the distinctive characteristics of a type, period, region, or method of construction, or a representation of the work of a master, or possesses high artistic values.
4. A resource that has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

Impacts on Native American burials on non-federal land are considered under CCR, Title 14, Chapter 3, Section 15064.5(d)(1), Public Resource Code Section 5097.98, and Health and Safety Code Section 7050.5. When an agency identifies the existence of, or the probable likelihood of, Native American human remains on non-federal land within a project, the lead agency is required to work with the appropriate descendants, as identified by the Native American Heritage Commission. In the event of an accidental discovery, the procedures outlined in CCR, Title 14, Chapter 3, Section 15064.5(e) will be followed.

3.6.2 Existing Conditions

Cultural Context

Understanding the historic and environmental context in which cultural resources exist is imperative to evaluating impacts of projects on those resources. *The earliest explorations of the Mojave and Colorado Deserts took place in the 1930s and 1940s (Campbell 1931, 1936; Campbell and Campbell 1935; Campbell et al. 1937; Rogers 1939, 1945). During this time a basic cultural-historical outline was established, which has formed the foundation for subsequent efforts (Arnold et al. 2002; Love and Dahdul 2002; Schaefer 1994; Warren 1984).*

Numerous cultural resource management projects have increased our understanding of the prehistory of the region. Two of the most notable synthetic works include the BLM's large-scale cultural resources inventory of the Central Mojave and Colorado Desert Regions (Gallegos et al. 1980) and Crabtree's (1980) overview. Jones and Klar's (2007) recent review of California archaeology builds on the efforts of these earlier authors, including the results of recent data recovery projects (Schaefer and Laylander 2007; Sutton et al. 2007). The following discussions of cultural contexts for the Project are taken directly from ECORP (2009b), which documents cultural resource survey and monitoring efforts associated with geotechnical studies completed for the proposed Project.

Prehistoric Context

It is generally believed that human occupation of southern California began at least 13,000 years before present (BP). The archaeological record indicates that between approximately 13,000 and 6,000 years BP, a predominantly hunting economy existed, characterized by archaeological sites containing numerous projectile points and butchered large animal bones. Animals that were hunted probably consisted mostly of large species still alive today. Bones of extinct species have been found, but cannot definitely be associated with human artifacts. Although small animal bones and plant grinding tools are rarely found within archaeological sites of this period, small game and plant foods were probably exploited on a limited basis. A lack of deep cultural deposits from this period suggests that groups included only small numbers of individuals who did not often stay in one place for extended periods (Wallace 1978).

Around 6,000 years BP, there was a shift in focus from hunting toward a greater reliance on floral resources. Archaeological evidence of this trend consists of a much greater number of milling tools (e.g., metates and manos) for processing seeds and other vegetable matter. This period, which lasted until around 3,000 years BP, is sometimes referred to as the "Millingstone Horizon" (Wallace 1978).

Projectile points are found in archaeological sites from this period, but they are far fewer in number than from sites dating to before 6,000 years BP. An increase in the size of groups and the stability of settlements is indicated by deep, extensive middens at some sites from this period (Wallace 1978).

In sites dating to after about 3,000 years BP, archaeological evidence indicates that reliance on both plant gathering and hunting continued as in the previous period, with more specialized adaptation to particular environments. Mortars and pestles were added to metates and manos for grinding seeds and other vegetable material. Chipped-stone tools became more refined and specialized, and bone tools were more common. During this period, new peoples from the Great Basin began entering southern California. These immigrants, who spoke a language of the Uto-Aztecan linguistic stock, seem to have displaced or absorbed the earlier population of Hokan-speaking peoples. The exact time of their entry into the region is not known; however, they were present in southern California during the final phase of prehistory. During this period, known as the "Late Horizon," population densities were higher than before and settlement became concentrated in villages and communities along the coast and interior valleys (Erlandson 1994; McCawley 1996). Regional subcultures also started to develop, each with its own geographical territory and language or dialect (Kroeber 1925, McCawley 1996; Moratto 1984). These were most likely the basis for the groups encountered by the first Europeans during the eighteenth century (Wallace 1978). Despite the regional differences, many material culture traits were shared among groups, indicating a great deal of interaction (Erlandson 1994). The presence of small projectile points indicates the introduction of the bow and arrow into the region sometime around 1,500 to 1,000 years BP (Moratto 1984).

Regional Prehistory

The prehistory of the Chuckwalla Valley region is associated with the wider geographic context of Arizona, California and Baja California. *This environmental zone is transitional between the Colorado Desert to the south and west, the Mojave Desert to the north, and the Sonoran Desert to the east.* The prehistory of this region can be divided into three broad cultural periods: the San Dieguito Complex, Desert Archaic Period, and the Patayan (or Yuman) Period. The San Dieguito Complex (a group of artifacts and subsistence remains that are characteristic of a specific period of time and geographic area) was originally thought to represent Early Holocene (12,000 to 8,000 BP) big game hunters who lived around the pluvial lakes in the Great Basin and Colorado Desert (Warren 1967). More recent research indicates these people were likely highly mobile hunter-gatherers who exploited a wider range of animal and plant foods. The San Dieguito Complex is represented in the archaeological record entirely by lithic technology (stone tools), which consists of well-made projectile points, bifacial blades and knives, scrapers, scraper planes, and choppers. San Dieguito sites consist of lithic scatters, rock features, cleared circles, and trails and are usually found on terraces overlooking drainages and along the shorelines of the former pluvial lakes such as Lake Cahuilla and Palen Lake (CE Obsidian Energy 2002).

Only a small amount of archaeological material is known from the Chuckwalla Valley region for the long period of time known as the Desert Archaic or Pinto-Amargosa period between about 8,000 BP and about 1,500 BP (IID 2002). Large bifacial dart points continue in use, but there is also an increasing variety of expedient and formed flaked lithic tools. Milling equipment, indicating use of plant seed resources, also appears during this period. Some food storage is indicated by the presence of stone-lined cache pits at Indian Hill Rockshelter and Tahquitz Canyon. The sparse occupation during the middle Holocene may be related to extremely arid climatic conditions and fluctuations in

the level of Lake Cahuilla (IID 2002), an ancient lake that formed whenever the Colorado River would drain into the Salton Basin. The freshwaters of Lake Cahuilla would eventually evaporate.

The Late Prehistoric Period in the Colorado Desert has been termed the Yuman period and is now more often referred to as the Patayan Pattern (IID 2002). The Patayan Pattern first developed on the Colorado River around AD (Anno Domini) 500 and is defined by mobile groups living in dispersed seasonal settlements. Rocklined jacal structures (thatched-roof huts), semi-subterranean earth houses, simple ramadas, and rock lined brush huts were constructed depending on the season and function of the settlement (Schaefer 1994). Patayan I dates from AD 500 to AD 1050 and is marked by the introduction of the bow and arrow, indicated archaeologically by the presence of small arrow points. Ceramics appear during the end of Patayan I and are the indicator for Patayan II (AD 1050 to AD 1500). Bands of people used a series of temporary camps in a seasonal round as they moved between the valleys of the Peninsular Ranges to the west and the shores of Lake Cahuilla. Fish and migratory waterfowl were important lake resources. Desert resources included mesquite and saltbush (IID 2002). Patayan III after AD 1500 is associated with the recession of Lake Cahuilla. Fish was an important resource, as indicated by large amounts of fish bone found in sites along the receding shorelines of Lake Cahuilla. Stone fish traps were used on the west side of Lake Cahuilla during both Patayan II and Patayan III (IID 2002). Early theories argued that the inhabitants around Lake Cahuilla underwent a mass migration from the area after the final recession of the lake. However, more recent studies, including several investigations of the large settlements at San Sebastian established on the dry bed of Lake Cahuilla, suggest that a period of readjustment occurred in the region instead of a mass exodus (Schaefer 1994).

Local Prehistory

The known archaeology of the Chuckwalla Valley vicinity has revealed the presence of widely separated oases sites which all contain similar cultural features. Trail segments preserved in the desert pavements radiate out in several directions from these sites and once linked them together. Washes and drifting sands have disconnected most of these trails leaving only these segments. These sites also typically feature cleared circles and/or rock rings, and numerous petroglyphs. One of these sites, the North Chuckwalla Mountains Petroglyph District, CA-RIV-1383, is located near proposed Substation A. Other such sites are located at Corn Springs, McCoy Springs, Hayfield Dry Lake, and Mule Tank.

Ethnohistoric Context

Ethnographic accounts of Native Americans indicate that the Project Study Area lies near a territorial junction of *six* groups of Native Americans: the Quechan, *Halchidhoma, Serrano,* Chemehuevi, Cahuilla, and Mojave.

Quechan

The Quechan territory was centered between the confluence of the Gila and Colorado Rivers near Yuma, Arizona, and ranged northward to the vicinity of Blythe, California. The Quechan are popularly referred to as Yuma (Stewart 1983a). The language of the Quechan is, together with the Mohave and Maricopa, from the River-Yuman branch of the Hokan language family. The linguistic territory included southeastern California and southwestern Arizona (Bean 1978). Although the settlements and rancherias were scattered along the rivers, the people considered themselves one tribal group. Forbes estimates the Quechan population at 4,000 at the time of European contact. Several hundred people would live in each Rancheria, with approximately 800 reported in 1774 by

the Spanish at Xucsil (Bee 1983, Forde 1931). European disease and warfare reduced the total population to nearly 2,800 in 1852, and 834 in 1910 (Forbes 1965).

In the early 1800s the Quechan were closely allied with the Mojave, while both groups were hostile toward their Cocopa neighbors to the south (Stewart 1983a). The Quechan practiced horticulture in the rich silts deposited by the winter and spring flood periods of the rivers. Plant gathering in addition to cultivated plants provided a balance to the Quechan diet. Planted fields produced maize, teparies, melons, watermelons, black-eyed beans, pumpkins, and muskmelons. Winter wheat was harvested before the spring floods. *Agriculture was supplemented with hunting of game* (Bee 1983).

The Quechan tradition tells of a southward migration by their ancestors from the sacred mountain, Avikwame (Newberry Mountain, near Needles, California) by way of the river. They had been created there, along with the Mohave, eastern Tipai, Maricopa and Cocopa, by Kukumat, the creator. A mourning ceremony was performed in the memory of a family member or an important tribal leader. This ceremony was also a reenactment of the original mourning ceremony upon the death of Kukumat. A microcosm of the Quechan way of life was represented during this ceremony *(Bee 1983)*.

The Spanish, Mexicans, and Anglos found the confluence of the Colorado and Gila Rivers of great importance for early migration. The two rivers accommodated vast migrations of soldiers and settlers to California and to the south and east before 1776. Salvador Palma, a Quechan leader, and three other tribesmen accompanied de Anza on his return to Mexico City. Shortly after 1776, the Spanish established two major settlements near the rivers. A period of unrest followed as the settlers turned to the Quechan fields for food and Spanish authority persisted over the native people. In 1781, the Quechan destroyed the two settlements, killing several dozen of the Spanish and ending Spanish regional authority. Resistance continued until the United States Army built a small garrison in 1852 that protected against Native American attacks on Anglos traversing the region. The growth of an Anglo town just south of the fort, and increased rail and steamship industry created employment for the Quechan as laborers or domestic help.

In 1884, a reservation was established for the Quechan on the west side of the Colorado River north of Yuma (Bee 1983). *In 1959, the Indian Claims Commission affirmed the Quechan Tribe's title to certain lands it claimed in California, title to which was extinguished by the United States in 1853. In compensation for the taking of that land outside their reservation, the Quechan Tribe was awarded a settlement which the Tribe approved in 1965.* In 1978, 25,000 acres of the original reservation *that had been appropriated* were returned to the tribe, the conclusion of a dispute over the legality of the signing away of tribal lands in 1893. A dam built upstream from the reservation by 1912 changed the flooding and siltation patterns. Many Quechan migrated from the outlying areas to the reservation by this time.

Halchidhoma

The Halchidhoma are a Yuman-speaking group of the Western Hokan language stock. Traditionally the Halchidhoma occupied territory south of the confluence of the Gila and Colorado Rivers and south of the Quechan. Population densities prior to tribal conflicts and Spanish contact are uncertain but may have been high. In 1605, Spanish explorer Don Juan de Onate encountered an estimated 2,000 people living in the northernmost of the Halchidoma's eight camps (Kroeber 1925). The Halchidhoma and the Yumas were rivals, and the Halchidhoma sustained severe population losses from warfare with the Yumas. Francisco Garcés, who encountered the Halchidhoma

in 1776, estimated approximately 2,500 people in the entire group. By the eighteenth century, they had moved north to occupy an area along the Colorado River between present day Parker and Blythe/Ehrenberg.

The Halchidhoma were horticulturalists who supplemented their diet with hunting and gathering. Seasonal settlement patterns reflect a changing floodplain environment and consisted of camps located on the river terraces during the winter and spring, and dispersed extended family camps located on the river floodplain near their horticultural plots during the summer and fall (Cleland and Apple 2003). Planted crops included maize, squash, and beans. Wild plants such as Mesquite pods and Screwbean pods remained an important staple.

By the mid-nineteenth century, the Halchidhoma were driven from their territory in the Parker-Blythe area by the Quechan-Mojave alliance. They took refuge with the Maricopa, with whom they had developed close relations (Kroeber 1925; Cleland and Apple 2003). Due to the merging and assimilation into Maricopa culture, detailed ethnographic studies of the Halchidhoma in their native territory along the Colorado River are scarce (Cleland and Apple 2003; Schaefer 2003).

Serrano

Territory traditionally claimed by the Serrano included the San Bernardino Mountains east of Cajon Pass, lands at the base and north of the San Bernardinos in the desert near Victorville, and territory extending east in the desert to Twentynine Palms and south to, and including, the Yucaipa Valley. The Serrano spoke a language belonging to the Serean Group of the Takic subfamily of the Uto-Aztecan family (Golla 2007; Moratto 1984; Shipley 1978).

The Serrano occupied small village-hamlets located mainly in the foothills near water sources. Others were at higher elevations in coniferous forest, or in the desert. The availability of water was a critical determinant of the nature, duration, and distribution of Serrano settlements.

Women gathered, and men hunted and occasionally fished. Topography, elevations, and biota present within the Serrano territory varied greatly. Primary plant foods varied with locality. In the foothills, they included acorns and pinyon nuts. In the desert, honey mesquite, pinyon, yucca roots, and cactus fruits were staples. In both areas they were supplemented by a variety of roots, bulbs, shoots, and seeds, especially chia. Among primary game animals were deer, mountain sheep, pronghorn, rabbits, rodents, and quail. Large game was hunted with bows and arrows. Small game was taken with throwing sticks, traps, snares, and deadfalls. Meat was cooked in earth ovens. Meat and plant foods were parched or boiled in baskets. Plant foods were ground, pounded, or pulverized in mortars and pestles or with manos and metates. Processed meat and plant foods were dried and stored. Occasional communal deer and rabbit hunts were held. Communal acorn, pine nut, and mesquite gathering expeditions took place. These communal activities involved several lineages under a lineage leader's authority.

Serrano houses were circular, domed, individual family dwellings, with willow frames and tule thatching. They were occupied by a husband and wife along with their children, and often other kin. Houses were mainly used for sleeping and storage. Most daily activities occurred outside, often in the shade of a ramada (a flat-roofed, open-sided shade structure) or other sun cover.

Settlements usually had a large ceremonial house where the lineage leader and his family lived. It was the social and religious center for each lineage/lineage set. The latter was two or more lineages linked by marriage, economic reciprocity, and ritual participation. Other structures included semi-subterranean, earth-covered sweathouses located near water, and granaries.

Serrano material culture was very similar to that of the Cahuilla. Stone, wood, bone, plant fibers, and shell were used to make a variety of artifacts. These included highly decorated baskets, pottery, rabbit skin blankets, bone awls, bows

and arrows, arrow straighteners, fire drills, stone pipes, musical instruments, feathered costumes, mats, bags, storage pouches, cordage, and nets.

The clan was the largest autonomous landholding and political unit. No pan-tribal union between clans existed. Clans were aligned through economic, marital, and ceremonial reciprocity. Serrano clans often were allied with Cahuilla clans and Chemehuevi groups. The core of a clan was the linage. A lineage included all men recognizing descent from a common ancestor, their wives, and their descendants. Serrano lineages were autonomous and localized, each occupying and using defined, favored territories. A lineage rarely claimed territory at a distance from its home base.

The head of a clan was a ceremonial and religious leader. He also determined where and when people could hunt and gather. Clan leadership was passed down from father to son. The clan leader was assisted by a hereditary ceremonial official, from a different clan. This official held ceremonial paraphernalia (the sacred bundle), notified people about ceremonies, and handled ceremonial logistics.

Sources for the Serrano include Bean and Smith (1978), Benedict (1924,1929), Drucker (1937), Gifford (1918), Johnson (1965), Kroeber (1925), and Strong (1929). The Serrano shared many traits and artifacts with the Cahuilla, discussed below.

Chemehuevi

The Chemehuevi are one of 16 identified Southern Paiute *ethnolinguistic* groups, and likely originated from the Great Basin. The main territory occupied by the Southern Paiute-Chemehuevi group was west of the Colorado River, extending approximately from present-day Blythe to just north of Needles and into California halfway to Twenty-Nine Palms (Kelly and Fowler 1986; Earle 1997). The name Chemehuevi is a Mohave word describing them. They call themselves Nuwuwu, or "the people" (Elzinga 2007). The Chemehuevi language is a nearly extinct dialect of the Ute language of the Numic branch of the Uto-Aztecan stock that extends from the Great Basin of North America through Mexico (Bean 1978). Although large game was hunted, small game was the chief source of protein. Plant foods included pinyon nuts, roots, agave, seeds, and berries. Some horticulture was practiced at the time of Spanish contact in the 1770s (Earle 1997). Settlement was mobile and scattered, with recurrent residence in specific locations. Structures varied according to the season. During the winter, the Chemehuevi lived in earth-covered dwellings or caves (Kelly and Fowler 1986).

Some Southern Paiute-Chemehuevi raided travelers along the Old Spanish trail from the 1850s to the early 1870s. During that time, efforts were made to settle the Chemehuevi on the Colorado River Reservation, but many did not agree to move there until the twentieth century. In 1980, there were approximately 124 Southern Paiute-Chemehuevi (Kelly and Fowler 1986).

Cahuilla

The Takic language of the Cahuilla is a family of the Uto-Aztecan stock, which extends from the Great Basin of North America through Mexico (Bean 1978). The Cahuilla ancestors probably originated in the Great Basin. The Cahuilla occupied a territory ranging from the San Bernardino Mountains in the north to the Chocolate Mountains and Borrego Springs in the south, and from the Colorado Desert in the east to Palomar Mountain in the west.

The Cahuilla were organized into more than a dozen political groups or clans. Each clan was an independent, politically autonomous land-holding unit. The territories ranged from the desert or

valley floor to mountain areas encompassing several biotic zones. Clans included several lineages, each of which owned an independent community area within the larger clan area (Schaefer 2001).

In addition to residence areas of each lineage, and locations within a clan territory owned in common with other clan members, each lineage had ownership rights to various food collecting, hunting, and other areas. Individuals also owned specific areas or resources such as plant foods, hunting areas, fishing areas, mineral collecting places, and sacred spots used only by shamans, healers, and ritual practitioners (Schaefer 2001).

These clans' population was up to several thousand people. They were arranged so that each lineage or community was placed in an area near significant water and food resources, most commonly in canyons or near drainages on alluvial fans. Within each community, generally several miles from each other, houses and structures were spaced at some distance from each other. Often a community would spread over a mile or two with each nuclear and extended family having houses and associated structures for storage of food, and shaded work places for tool manufacture and food processing. Each community contained a house of the lineage or clan leader (Schaefer 2001).

The Cahuilla are known to have engaged in trade, marriage, shared rituals, and war with other groups of Native Americans whose territories they overlapped—primarily the Serrano to the north and the Gabrielino/Tongva to the northeast (Kroeber 1925; Bean 1972, 1978).

Cahuilla subsistence consisted of hunting, gathering, and fishing. Major villages were fully occupied during the winter, but during other seasons task groups made periodic forays to collect various plant foods, with larger groupings from several villages organizing for the annual acorn harvest (Bean and Saubel 1972). Bean and Saubel (1972) recorded the use of several hundred species of plants used for food, building/artifact materials, and medicines. The major plant foods included acorns, pinyon nuts, and various seed-producing legumes. These were complemented by agave, wild fruits and berries, tubers, cactus bulbs, roots and greens, and seeds. European explorers and settlers (including Captain Don Jose Romero in 1823) reported the Cahuilla as agriculturally active, growing pumpkin, melon, watermelon, barley and wheat at the village of Toro near Thermal (Bean and Saubel 1972; Schaefer and Laylander 2007).

Hunting focused on small- to medium-sized mammals, such as rodents and rabbits, and large mammals, such as pronghorn, mountain sheep, and mule deer. Hunting was done using the throwing stick or the bow and arrow, though nets and traps were also used for small animals (Bean 1972).

Cahuilla buildings consisted of dome-shaped or rectangular houses, constructed of poles covered with brush, and above-ground granaries (Strong 1929; Bean 1978). Wells of various types, including walk-in wells and hand-dug wells, were also constructed using mesquite wood shovels and baskets to remove earth (Heizer and Whipple 1971; Schaefer 2001). Other material culture included pottery; grinding implements; stone tools, arrow shaft straighteners and bows; clothing (loincloths, blankets, rope, sandals, skirts, and diapers); and various ceremonial objects made from mineral, plant, and animal substances (Bean 1972).

While most daily secular and religious activities took place within the community, there were places at some distance from the community where people stayed for extended periods of time (e.g. acorn or pinyon groves). Throughout the area there were sacred places used primarily for rituals,

intergroup or inter-clan meetings, caches for sacred materials, and locations for use by shamans. Generally hilly, rocky areas, cave sites, or walled cave sites were used for temporary camping, food storage, fasting by shamans, and as hunting blinds (Schaefer 2001).

There may have been as many as 6,000 to 10,000 Cahuilla at the first European contact in 1797. During the first encounters, Spanish explorers passing through the desert valley found that the Cahuilla and the neighboring Quechan to the east were hostile. Because of this, and the difficulty with traversing the harsh desert environment, Europeans mostly used sea routes during the early settlement of California. Starting in the 1770s, western relatives of the Torres Martinez often were baptized at the missions in San Gabriel, San Luis Rey, and San Diego and worked among the Spanish. In 1816 to 1819, several asistencias were established near Cahuilla territory in Redlands, Santa Ysabel, and Pala. Through these asistencias, Cahuilla had greater interaction with Spaniards and adopted some forms of Spanish lifestyles and culture including agriculture, cattle and horse raising, clothing, language, and religion (Bean 1972, 1978).

At least ten Cahuilla villages were recorded in the southwest end of Coachella Valley in the 1850s (Wilke et al. 1975) according to US government survey maps and other data from that time. These villages include Cabazones, Martinez, Toro, La Mesa, and Agua Dulce. At least 10 walk-in and hand-dug wells were also noted (Schaefer 2001). The arrival of Americans, after about 1850, brought competition for land, and the Cahuilla started to lose some of their land to American cattle grazing interests. In 1851, the Toro leader, Chungil, joined other Cahuilla and Luiseño leaders in signing a treaty with the United States Government, which Congress never ratified (Schaefer 2001). A smallpox epidemic in 1863 had the largest post-contact impact on the Cahuilla, killing hundreds. The surviving Cahuilla continued a fairly independent lifestyle, occupying their own land and combining traditional subsistence practices with wage labor. This soon changed with the federal government establishing reservation lands and forcing tribal groups to reside within those boundaries. The federal government began to closely supervise the native population. Government schools were opened to train young Cahuilla in menial tasks. Traditional cultural practices were strongly discouraged and government officials controlled political organization. Organized protests over the next several decades eventually led to greater political autonomy after World War II, but also led to decreased government services and funding for health, education, welfare, and economic development programs. In the 1960s, however, greater federal funding became available for these types of programs, improving conditions for the Cahuilla. In 1974 there were about 900 people claiming to be Cahuilla (Bean 1978). Census data from the year 2000 indicates over 1,500 people of Cahuilla descent resided on eight separate reservations in southern California (US Census Bureau 2008).

Mohave

The Mohave comprised the northernmost and largest of the Yuman-speaking tribes along the lower Colorado River in prehistoric times. Their territory was approximately 150 miles long and on both sides of the Colorado River, on what are now the California, Nevada, and Arizona state borders. The Mohave lived in sprawling settlements in rural neighborhoods that were scattered throughout the valleys. Extended families formed settlements that might stretch for one to two miles, with four to five miles between settlements. Most of the year, open-sided shades (armadas) provided shelter, while more substantial sand-covered houses were used in the winter.

The Mohave primarily depended on floodplain farming in the lowlands along the river for subsistence, supplementing their diet with fishing and gathering wild plants. The principal crop was maize. Several varieties of beans, pumpkins, and melons were also grown. In times of drought, the Mohave relied more heavily on hunting, fishing, and gathering. Wild seeds, cactus fruits, and mesquite were commonly collected. Deer and rabbit were occasionally hunted. Despite division into local groups, the Mohave considered themselves one nation with a well-defined territory, enabling them to present a united front in warfare against all enemies. The Mohave had a system of patrilineal clans with names of totemic origin. Clans played no part in religious or secular life. However, the Mohave did have a war chief that would lead others into battle. At death, the body was cremated with personal possessions (Stewart 1983b).

The first Spaniard to reach the Mohave Valley, Father Francisco Garces in 1776, estimated the Mohave population at 3,000. No missions or Spanish settlements were established in Mohave territory and few changes occurred to the Mohave way of life until Anglo-American trappers began to travel through the region in the 1820s. Apprehensive of the increasing numbers of Whites entering their territory, the Mohave attacked a wagon train in 1858. As a result, the Americans established Fort Mohave and soon the Mohave were defeated by the US Army. Disease and poverty followed the Mohave's defeat. These conditions did not change until around the turn of the century. *By the mid- to late-1900s*, many of the Mohave people lived on the Colorado River Reservation, with income from irrigated farms and leases of reservation land to non-Indians (Stewart 1983b).

Historic Context

The history of the Chuckwalla Valley/Desert Center region since the time of European contact (1774) is characterized by several themes, including exploration, transportation, creation of the Colorado River Aqueduct, mining, and military training. Each of these contributed to the growth and development of the region.

Exploration

In 1774 and 1776, two different Spanish expeditions, led by Juan Bautista de Anza, crossed Yuman territory in search of a travel route across the desert; and recorded some of the flora and fauna that they found. On de Anza's return to Mexico City from his second expedition, Chief Palma and three companions accompanied him to petition for the establishment of a mission.

During this period, several asistencias associated with the Spanish missions were established in Redlands, Santa Ysabel, and Pala. Given the distance from Desert Center, they had little impact on the settlement of the Project area but did have an impact on the lives of the native inhabitants of the region.

By the Mexican Period (beginning in 1821), Maricopa Indian messengers carried mail between Sonora and the California coast, through the northern Colorado Desert and the San Gorgonio Pass. About the same time, from 1815 to the 1830s, Indians from San Gabriel Mission made annual trips into the Salton Sink to collect salt (Hoyt 1948; Fitch 1961; Johnston 1977; Pourade 1971; Bannon 1974; Nordland 1977).

In 1825, Captain Jose Maria Romero led a small party from the Los Angeles area through the San Gorgonio Pass and across the Coachella Valley east to Blythe in search of a transportation route from the Los Angeles and San Diego area to Arizona. Once reaching the Colorado River, they

turned south toward Yuma. After the journey, a southern route that ran directly from Yuma to San Diego through the present-day site of Brawley, was deemed preferable to the San Gorgonio-Blythe route, and the "Southern Route" became the official road from Sonora to Alta California (Hoyt 1948; Johnston 1977; Nordland 1977; Pourade 1971). Ranchos, predominant in other portions of California, were not established in the Coachella Valley during this period.

Transportation

During the gold rush of the late 1840s and early 1850s, thousands of prospectors and other immigrants came to California by the Southern Route. Semi-weekly stage service by the Butterfield Overland Mail Company, crossing Imperial Valley from Yuma to San Diego and Los Angeles, was begun along this route in 1858 (Dowd 1960; Fitch 1961).

In 1862, gold was discovered near Blythe, creating the need for a direct route eastward from California to Arizona. In response to this need, William D. Bradshaw used existing roads to travel from Los Angeles to Dos Palmas Oasis near the current northeastern shore of the Salton Sea. From there, Bradshaw's party crossed the Orocopia and Chuckwalla Mountains, five miles south of Desert Center, and followed ancient Indian trails east using a map drawn for them by Cabazon, a Cahuilla chief, reaching the Colorado River just northeast of Blythe (Johnson 1977; Ross 1992).

The Bradshaw trail was the main means of communication between southern California and the eastern part of the United States until the 1877 completion of the Southern Pacific Railroad from Los Angeles to Santa Fe, New Mexico through Indio and Dos Palmas. By the 1880s, however, passenger coaches were discontinued in favor of the railroad, and express and mail contracts were subsequently primarily carried by mule trains and freight wagons. The Bradshaw trail was used as a freight route until the twentieth century, and even accommodated automobile travel until the highway that eventually became Interstate 10 was built, farther to the north, in the early part of the twentieth century (Johnston 1977; Ross 1992).

Automobiles began replacing buckboards (four-wheeled wagons drawn by a horses or mules) about 1910. Because of bad roads, the high-centered Model-T became the vehicle of choice. At that time, no maps, road signs, or service stations existed. Venturesome motorists in Southern California, faced with these circumstances, banded together in 1900 to form a touring club and began publishing a monthly magazine with tips on travel and directions to popular destinations (Von Till Warren 1980). As desert driving could be perilous, motorists began advocating for better information and road assistance. In 1917, the U.S. Geological Survey erected signs directing travelers to water at 167 localities in California's desert (Thompson 1921). The California Department of Engineering, after paving its first auto road in 1912, began issuing maps in 1918 (Von Till Warren 1980).

In 1915, the Chuckwalla Valley Road was essentially 90 miles of blow sand and cross washes with a couple of ruts. It was not until 1936 that U.S. Highway 60/70 between Indio and Blythe was paved (Norris and Carrico 1978). In 1968, this highway became Interstate 10 (I-10), a major transportation corridor through the Chuckwalla Valley today, connecting Los Angeles and Phoenix. Most other roads in the area remained unpaved.

Creation of the Colorado River Aqueduct and Mining Operations

In 1931, in an effort to bring much needed water to the area's booming population, 13 Southern California cities joined together to form the Metropolitan Water District of Southern California (Metropolitan). Metropolitan's primary mission was to supply its member cities with water for domestic and industrial uses (Hinds 1936). To accomplish this mission, the Metropolitan's first

priority was to construct the Colorado River Aqueduct. Construction of the aqueduct began in March 1933 and the initial phase was completed, more than eight years later, in June 1941 (Gruen 1998). When finished, the Colorado River Aqueduct was one of the longest water conveyance facilities in the world: a 242-mile-long aqueduct over mountains and desert that included power lines, tunnels, siphons, covered conduits, open canals, dams, reservoirs, and five pumping plants (Gruen 1998). The aqueduct begins at Parker Dam on the Colorado River and ends at Lake Mathews south of the city of Riverside.

The project provided jobs to as many as 10,500 people at certain times during the eight-year construction period, and 35,648 people in all (Gruen 1998). During the 1930s, a period of severe unemployment, it was the largest construction employment project carried out in Southern California. In 1995, the American Society of Civil Engineers named the Colorado River Aqueduct a National Historic Civil Engineering Landmark. Today, it is still the major water supply for urban and suburban Southern California (Gruen 1998).

In the early 1930s, geologists working for Henry Kaiser during aqueduct construction discovered a rich deposit of iron ore at Eagle Mountain, about 13 miles north of Desert Center. One of the world's largest open-pit mines operated there from World War II until it closed in the late 1980s. The mine was instrumental in support of both the aqueduct and the war effort. The communities of Eagle Mountain and Lake Tamarisk were founded to provide housing, along with Desert Center, for workers.

In the mid 1930s, Dr. Sidney Garfield built a four-bed clinic near the construction headquarters for the Colorado River Aqueduct, just southeast of Desert Center. Hearing that Garfield's practice was foundering and that he was ready to leave, Henry J. Kaiser, whose division of The Seven Companies was building the stretch of aqueduct through the Desert Center vicinity, suggested a plan for Kaiser to take five cents per week out of each worker's paycheck to prepay for that worker's future medical treatments, should an injury occur while he was working. If the worker wanted to cover his wife or children, he would pay an additional 5 cents. Garfield stayed and upon completion of the project he joined Kaiser to manage the healthcare for future construction projects. Garfield's operation was the basis of Kaiser Permanente, the largest managed health care system in California today.

Upon the mine's closure in the 1980s, a for-profit prison was built on mining land leased from Kaiser by Utah's Management and Training Corporation. The prison closed at the end of 2003.

General Patton's Desert Training Center

The Colorado and Mojave Deserts became the scene of the US Army's Desert Training Center (DTC) in April 1942, established in preparation for the allied landing in North Africa, under the command of Major General George S. Patton, Jr., who later became an American military legend in World War II. Camp Desert Center, one of the 11 divisional camps, was located in the Chuckwalla Valley east of Eagle Mountain, covering portions of the Project area. The Desert Center Army Airfield, as part of the DTC operations at Camp Desert Center, was created and operational sometime in the winter of 1942–1943 (Bischoff 2000). The DTC transformed 19,000 square miles of the desert into a simulated theater of operations, to teach trainees to live and fight in desert conditions, with a training regimen that stressed realism. After several months, in the summer of 1942, Patton and his newly trained personnel were ordered to depart the DTC for North Africa.

They were replaced by a second group of trainees in August 1942, commanded by Major General Alvan Gillem.

By early 1943, the campaign in North Africa was coming to a close, but the DTC was still considered valuable as a training program, so the concept of the DTC was changed to serve the purpose of large-scale training and maneuvering. This resulted in the expansion of the DTC into Arizona and Nevada, covering 31,500 square miles (Bischoff 2000). Accordingly, the name of the training center was changed to the California-Arizona Maneuver Area (C-AMA) to reflect its expansion in size and purpose. More than a million men participated in the intense training held at the DTC/C-AMA before it was closed in April 1944, after the direction of World War II had shifted to the Allies' favor (Bischoff 2000).

According to Bischoff (2000), little is known about Camp Desert Center, and it is unclear what types of activities occurred there. Use permits obtained from the War Department include land located within Sections 26, 28, 30, 32, and 34, T5S R14E, and Sections 1 to 15, 17, 18, 22, and 30 to 34 T4S R15E. The majority of this land was likely used for maneuvers, but an encampment with temporary housing structures, an evacuation hospital, observer's camp, ordnance camp, and quartermaster truck site were also reported to have been at Camp Desert Center, although their exact location is unknown (Bischoff 2000). Rock-lined, oil-paved, and asphalt roads, walkways, tent areas, rock insignias, and refuse, similar to what is found at the other divisional camps, are reported to be found on the desert landscape east of Eagle Mountain Road and spread across the valley north of the town of Desert Center.

The Desert Center Army Airfield, located approximately one mile east of Route 177 and five miles northeast of Desert Center, contained two 5,000-foot-long paved runways and more than 40 buildings associated with the operational activities. The airstrip remains, but most, if not all, of the original buildings have been dismantled and removed (Bischoff 2000).

Community of Desert Center

Desert Center is an unincorporated town located at the junction of I-10 and SR-177. Current population estimates are unclear, as the 2000 Census does not include Desert Center in its listing (US Census Bureau 2008). Stephen Ragsdale founded the town in 1921 as a rest stop on the new US Route 60 (now I-10). The town has been sparsely populated, remaining a key rest stop on the desert crossing. A number of mobile home parks and agricultural operations, such as jojoba farms planted in the 1980s, add to the current local economy. The community of Lake Tamarisk, created by Kaiser Steel, is two miles north of Desert Center. The former Army Air Field remained as a local, seldom-used airport (Freeman 2006). This airport has been redeveloped as a private racetrack and airstrip.

Geoarchaeological Context and Potential for Subsurface Archaeological Resources

Understanding the geoarchaeological context of the Project area helps in determining the potential for subsurface archaeological deposits for which there may not be any surface indications. ECORP's geoarchaeological study (ECORP 2010) has identified and mapped six primary surface deposit types within the Solar Farm area; no additional Project component areas were examined. The following is based on ECORP (2010).

The surface deposits observed are comprised of alluvial sediments consisting of stream channel, sheet wash, and alluvial fan deposits. Six map units were identified within the Solar Farm area (see Appendix A in ECORP 2010a). Map units Qya, Qaly, Qal, and Qfy all represent younger alluvium that appear to be late Holocene to recent in age. These deposits have the potential to contain or overlie archaeological materials. An intermediate age alluvium represented by map unit Qfm represents early to late Holocene deposits. The Qfm may contain or bury prehistoric cultural materials. Conversely, cultural materials may be limited to the surface of the oldest Qfm landforms. Pre-Holocene age alluvium is also present within the Project area, forming older alluvial fans in the northwestern and southwestern parts of the Solar Farm area. The older alluvial fan deposits (Qfo and Qfvo map units) are believed to be late Pleistocene in age, predating human occupation of the region, and thus archaeological materials should be limited to the surfaces of these landforms.

Young Alluvial Stream Deposits (Qya)

Recent alluvial stream deposits are present along a drainage course in the eastern part of the Solar Farm area. These deposits exhibit recently active depositional features and display no post-depositional weathering or soil formation. Given their geomorphologic setting and characteristics, the Qya deposits appear to be years to several decades in age. The Qya materials are derived from the surrounding previously deposited sediments and thus may have potential for containing cultural materials. Given the surface position of these deposits and their youthful age, Qya deposits may also bury other Holocene (pre-12,000 BP) deposits (i.e. Qal, Qaly, Qal2, Qfy). Stream deposits such as Qya are typically created by high energy events, and the integrity of archaeological materials in such depositional settings is likely low.

Young Alluvial Sheet Wash Deposits (Qaly)

Young alluvial sheet wash deposits cover much of the southeastern portion of the Solar Farm area. These deposits generally exhibit negligible surface weathering (i.e. no desert varnish formation) and thus are inferred to be less than approximately 500 years in age. However, a very weak reddening of the incipient basal varnish on clasts in the southernmost portion of the site suggests they may be slightly older in this area. Based on the surface characteristics, position, and the relationship to the surrounding deposits, the Qaly materials appear to be relatively thin and likely bury other Holocene alluvium. Given the inferred age for these deposits, the Qaly deposits have the potential for containing and/or burying deposits with cultural materials.

Young Alluvial Deposits (Qal)

The central part of the Solar Farm area is covered by younger sandy alluvium. Subsurface test pit profiles indicate very weak soil profile development within the Qal deposits. Comparisons with other regional soils suggest they may be Late Holocene (post-1,000 BP) in age or younger. The Qal alluvium originates from the west and northwest. In the northwestern part of the site in the vicinity of the older and topographically higher alluvial fan surfaces, the Qal deposits form relatively thin channels between and incised into the older alluvial fan surfaces. In the central portion of the site, the Qal deposits are approximately 4 to 8 feet (130 to 225 cm) thick and bury a previously eroded surface of older Pleistocene alluvial deposits (Qfo and/or Qfvo). Small-scale recently active stream channels are present locally within the modern surface of the Qal alluvium and indicate ongoing transport and redistribution of these materials. Based on the inferred age for these deposits, the Qal deposits have the potential for containing and/or burying cultural materials.

Young Alluvial Fan Deposits (Qfy)

Younger (Late Holocene to recent) alluvial fan deposits were observed along the outermost margins of the older and topographically higher alluvial fans in the northwestern and southwestern portions of the solar farm area. Given their mapped distribution, the younger fan deposits most likely rest upon older alluvium and/or the Qal deposits where they emerge from the fan drainages in this area. The Qfy fan surfaces display very weak desert pavement development and little to no varnish formation on clasts. Based on their geologic/geomorphic position and the absence of post depositional weathering, they appear to represent recent deposits that are several decades to several hundred years in age (50 to 500 BP) and thus may contain and/or bury deposits containing cultural materials.

Intermediate Alluvial Fan Deposits (Qfm)

Alluvial fan deposits of intermediate age (Early to Late Holocene) were identified in several locations in the western parts of the Solar Farm area. The geomorphic position and materials forming the Qfm deposits are similar to those of the younger Qfy fan alluvium. However, the Qfm deposits exhibit noticeably stronger desert pavement development on their surfaces with weak to moderate varnish formation. Based on the degree of pavement and varnish development present, these deposits likely date to the Early to Late Holocene (1,000 to ca. 12,000 BP). Some Qfm surfaces may be slightly older. Given the broad age range of these deposits, the Qfm deposits may contain and/or bury prehistoric cultural materials. However, cultural materials may be limited to the surface of the oldest Qfm landforms.

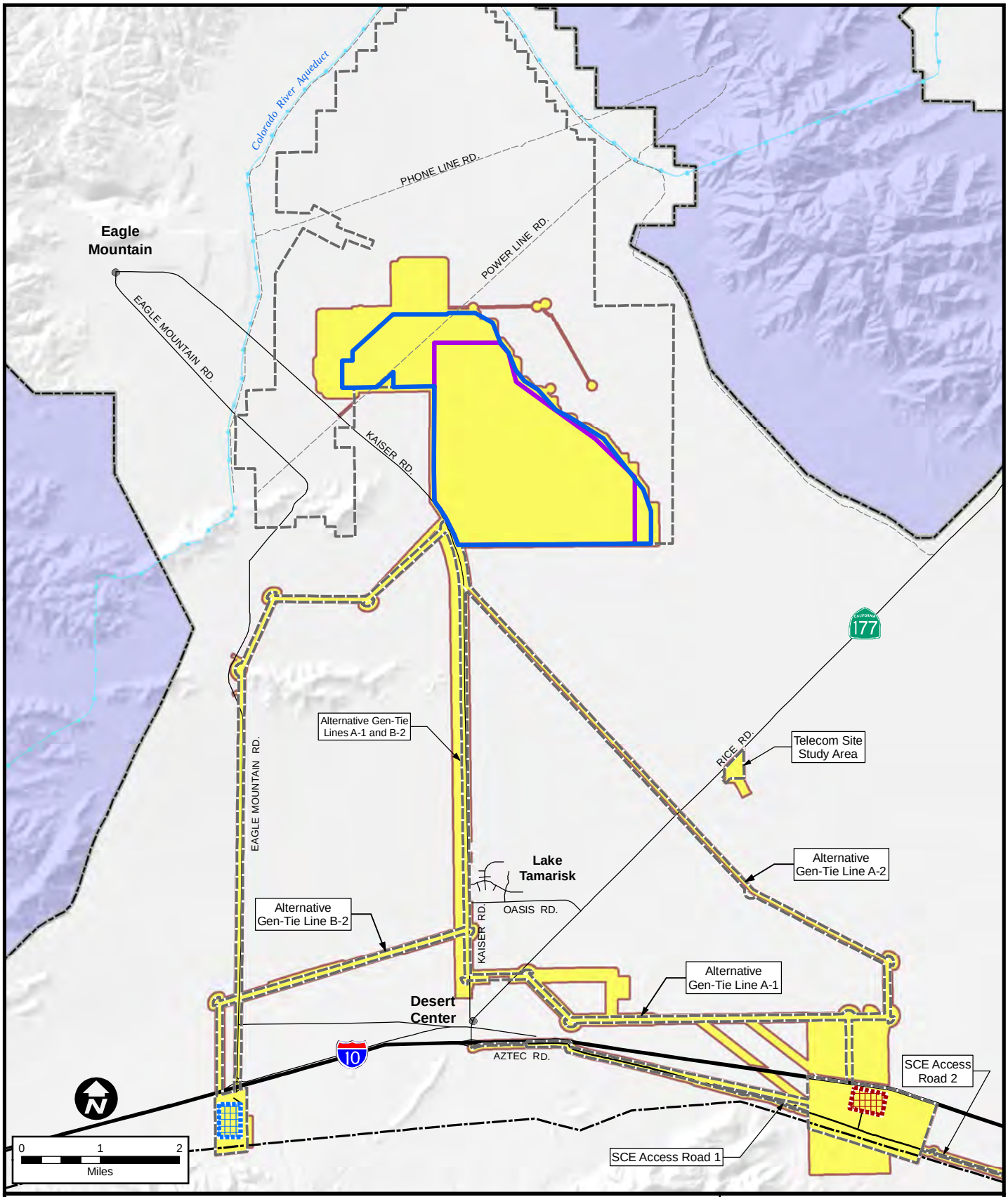
Older Alluvial Fan Deposits (Qfo and Qfvo)

Older alluvial fan deposits are present in the northwestern and southwestern portions of the Solar Farm area. These deposits are different in composition and appearance from the younger fan deposits and alluvium. The Qfo and Qfvo deposits have strong pavement development and varnish formation. In addition to the strong surface weathering characteristics, the older fan alluvium exhibits a very well developed soil profile. Given the geomorphic setting, strong pavement and varnish formation, and the strength of post-depositional soil profile development, these deposits are most likely late Pleistocene in age. Based on comparison to other dated alluvial fan deposits in the region, the Qfo landforms may be 14 to approximately 30 thousand years in age and the Qfvo fans appear to be approximately 40,000-80,000 years in age. The inferred Pleistocene age (pre-12,000 BP) for the Qfo and Qfvo alluvial fan deposits suggests that, if present, cultural materials would be limited to only the surfaces of these landforms.

Identified Cultural Resources

In conjunction with the EIS, Sunlight contracted with ECORP Consulting, Inc., to complete a Class I overview (ECORP 2009a) and a Class III pedestrian survey (ECORP 2010b). The Class I overview is a summary of literature, records, and other documents providing an informed basis for understanding the nature of the cultural resources of the study area. The review covered the Project Study Area plus a one-mile buffer. The Class III survey covered the Project Study Area (see Figure 3.6-1), identifying any cultural resources within those areas.

X:\GIS\Desert_Sunlight\MXD_Files\Cultural_Survey.mxd



LEGEND

- Class III Survey Area
- Desert Sunlight Study Area Boundary
- Solar Farm Boundary (Alternative B)
- Solar Farm Boundary (Alternative C)
- Red Bluff Substation (Alternative A)
- Red Bluff Substation (Alternative B)
- Joshua Tree National Park Boundary
- Devers-Palo Verde Transmission Line (DPV1)

Source: ECORP (IP).

DESERT SUNLIGHT SOLAR FARM

Figure 3.6-1

Class III Survey Area

Native American Consultations

ECORP contacted the Native American Heritage Commission to request a list of tribal contacts for the Project and to determine whether the Native American Heritage Commission's Sacred Lands File included any cultural resources within or near the Project area. Three separate searches of the Sacred Lands File were conducted: in April 2009, January 2010 and March 2010. These searches revealed no sensitive or sacred Native American resources in the vicinity of the Project areas that could be affected by the proposed Project. In addition to ECORP's work, the BLM Palm Springs-South Coast Field Office initiated consultation with federally recognized Indian tribes associated with the Project area through letters dated April 15, 2010 (Kline 2010). These consultations seek to identify issues of concern for the tribes, as well as sacred sites, traditional use areas, or TCPs that may be affected by the Project. At this time, the BLM has not received replies to consultation requests, and no traditional resources or sacred sites have been identified within or near the Project area. The BLM will continue Indian tribal consultations, the results of which will be incorporated into the *Memorandum of Agreement* for the Project, as discussed above. The fourteen tribes being consulted are Agua Caliente Band of Cahuilla Indians, Augustine Band of Cahuilla Mission Indians, Cabazon Band of Mission Indians, Chemehuevi Indian Tribe, Colorado River Indian Tribes, Cocopah Tribe, Fort Mojave Indian Tribe, Fort Yuma Quechan Indian Tribe, Morongo Band of Mission Indians, Pauma Band of Luiseño Indians, Ramona Band of Mission Indians, San Manuel Band of Mission Indians, Torres-Martinez Desert Cahuilla Indians, and the Twenty-Nine Palms Band of Mission Indians.

Class I Inventory

The Class I inventory included a records search through the Eastern Information Center at the University of California, Riverside, and a review of the BLM's records for the study area. The records search indicated that less than five percent (about 850 acres) of the 19,516-acre Project Study Area had been previously surveyed for cultural resources, and less than one percent (about 120 acres) had been surveyed in the last 10 years. The previous surveys that overlapped the Project Study Area and were less than 10 years old were primarily linear surveys along or parallel to I-10 and only crossed the Gen-Tie Line corridor alternatives. No previous surveys that are less than 10 years old were located within the area considered for the Solar Farm site.

The records search results indicated a variety of cultural resources had been previously recorded within the record search radius. These include prehistoric archaeological sites, prehistoric isolated finds, one prehistoric trail segment, historic archaeological sites, historic road segments, historic rock cairns and rock alignments, a historic highway marker, a historic mine claim marker, a historic water conveyance system, a multi-component archaeological site containing prehistoric and historic-age materials, and a "recent use area" site. The historic-era Eagle Mountain Mine and Townsite, a well-known historical feature of the area that was in operation between the mid-1940s and 1983 by Kaiser Steel, is approximately two miles northwest of the Solar Farm area. Eagle Mountain Railroad, which serviced the mine between 1948 and 1986, crosses the southwest corner of the Solar Farm study area but is not within any of the proposed Project components (ECORP 2010b; USGLO 1954a, 1954b, 1963a, 1963b, 1963c, 1963d, 1963e).

Four historic properties (i.e., resources listed on or eligible for listing on the NRHP) were identified as within one mile of the Project Study Area but not within any of the Project component areas. However, the historic landscapes of these resources do include the Project area, and they are therefore considered part of the ROI/APE. The Colorado River Aqueduct (P33-11265) has been

recommended as eligible for listing on the NRHP. Two nearby prehistoric resources are listed on the NRHP: the North Chuckwalla Mountains Petroglyph District and the North Chuckwalla Mountains Quarry Archaeological District. One prehistoric site, a rock art site with a sparse artifact scatter, has also been determined to be eligible for NRHP listing.

The *Class I survey identified 10* previously recorded resources within the boundaries of Project components. These are a prehistoric lithic scatter (P33-15093), a complex prehistoric site that includes petroglyphs, cairns, and lithic scatters (CA-RIV-1383), a historic telegraph*/telephone* line (P33-13987), a historic quartz reduction and refuse site (P33-14201), *a 46-acre historic period dump (P33-15095), a hospital site associated with the DTC (P33-15971), two historic roads (Kaiser Road and Eagle Mountain Road), the Blythe-Eagle Mountain transmission line, and US 60/70 with associated diversion dikes (P33-17766).*

Historic maps of the Project area consulted as part of the records search included the US Army Corps of Engineers (USACE) 15-minute Coxcomb Mountains and Chuckwalla Mountains, California topographic quadrangle maps from 1943 through 1945; US General Land Office (USGLO) plat maps from surveys conducted in 1855, 1856, and 1954 through 1957; and the US Geological Survey (USGS) 15-minute Coxcomb Mountains and Chuckwalla Mountains, California topographic quadrangle maps from 1963. Several historic-era resources identified as within the boundaries of at least one Project component are discussed below.

Brown's Wagon Road

The USGLO plat maps surveyed during the 1850s indicate no man-made features within or near the Solar Farm study area, with one exception. A segment of Brown's Wagon Road is shown crossing from west to east across all of the alternative Gen-Tie Line corridors (USGLO 1907a, 1907b, 1907c, 1907d, 1907e). This roughly east-west road appears on historic maps of the area from 1907 following a route roughly parallel to but about 0.5 mile north of the current I-10, in the area of Eagle Mountain Road. The route may have been used as early as 1825 during the expedition led by Captain Jose Maria Romero from Los Angeles to Arizona. The expedition reportedly traveled northeast between the Orocopia and Chuckwalla Mountains and then turned east. Surveys for potential railroad routes followed a similar path in the 1850s, with a trail established that became known as Frink's Route or Brown's Wagon Road. The Bradshaw Trail, established in 1862 and located approximately five miles to the south, became a more popular route through the area (BLM 2008d; Hoyt 1948; Johnson 1977; Ross 1992). Maps of the region from the early 1950s no longer show the road, and no indication of the road was noted during the Class III survey (ECORP 2010b).

Eagle Mountain Road

The USACE 15-minute Coxcomb Mountains and Chuckwalla Mountains, California topographic quadrangle maps of the early to mid 1940s (US Army Corps of Engineers 1943, 1944, 1945a, 1945b) show Eagle Mountain Road. This paved road first appears on historic maps of the area in 1943 and was most likely constructed at the same time as the Colorado River Aqueduct. It runs generally north from I-10 to the Eagle Mountain Pumping Station and then continues north and follows the Colorado River Aqueduct. GT-B-2 crosses Eagle Mountain Road about 1.1 miles north of I-10 as it heads west from Kaiser Road. It continues west past Eagle Mountain Road for about 0.2 mile, then turns south and runs parallel to Eagle Mountain Road, 0.2 mile away, until it reaches Red Bluff Substation B. The portion of the road that falls within and near the Project components was

examined during the Class III survey. It is in good condition with some signs of wear and aging, but no prominent ruts or cracks. Five archaeological sites and seven isolated finds were recorded within 150 feet of the road during the field survey. The sites include *the 36th Evacuation Hospital associated with the DTC (P33-15971), one historic-age road (CA-RIV-9396), one historic-age refuse deposit (P33-18376), and one historic-period telegraph/telephone line (P33-13987). The isolated finds include two prehistoric flakes (P33-18534 and P33-18537), four historic-age cans (P33-18533, P33-18539, P33-18540, and P33-18541), and one historic-age saddle (P33-18542)* (ECORP 2010b).

State Highway 60/70 and Diversion Dikes

State Highway 60/70 (replaced by today's I-10) is shown on the USACE 15-minute Coxcomb Mountains and Chuckwalla Mountains quadrangles as crossing all of the Gen-Tie Line corridor alternatives (US Army Corps of Engineers 1943, 1944, 1945a, 1945b). Mid-twentieth century USGLO plat maps (1954 through 1957) also show State Highway 60/70 (I-10) crossing all of the Gen-Tie Line corridor alternatives, Eagle Mountain Road, and several dirt roads. US Route 60 was established in 1932, from Arizona to Los Angeles, along the route of the former Legislative Route 64, which had been defined as an unimproved road in 1919. In 1936, US Route 70 was designated along the same route as Route 60 from Arizona to Los Angeles. The route was added to the Interstate Highway System in 1947 and designated as Interstate 10 in 1957. In 1964, the old Route 60 and Route 70 numbers were removed, leaving only the designation I-10 (California Highways 2010). The alignment of most of this original route remains relatively unchanged and has merely been redesignated as I-10. However, the physical characteristics of the route have been modified by several repavings and highway widening, so most of the original roadway is no longer extant. However, one segment of Route 60/70 still remains just south of where I-10 and Route 60/70 diverge. From just before Corn Springs Road and continuing eastward, Chuckwalla Valley Road is the remnant of the original Route 60/70 (ECORP 2010b).

Historic maps of the region from 1952 show several diversion dikes constructed along the southern edge of US Route 60/70 east of Desert Center. Many of these original dikes remain, although they have been modified over time. By 1963, this network of dikes had been expanded. These dikes are located south of I-10 and north of the proposed access roads from Corn Springs Road and Highway 177 to Substation A. Where Corn Springs Road meets the proposed access road (Access Road 2), these dikes come within several feet of the proposed access road and continue in this proximity for about one mile to the west. At this point, the dikes turn to the north and remain at least 850 feet from this proposed access road until the road reaches Red Bluff Substation A. Along the proposed access road from Highway 177 to Red Bluff Substation A, one dike crosses the access road at a point about 1.5 miles east of Highway 177. Although more recent dikes also bisect this access road, this is the only one that appears on historic maps and, therefore, is of historic age. Examination of the dikes during the Class III survey revealed that extensive modifications have been made to the system of dikes since what is shown on the 1963 historic map of the area. Numerous small holding ponds and additional dikes have been added, greatly modifying the original feature (ECORP 2010b).

Kaiser Road

On the USGS 15-minute Coxcomb Mountains and Chuckwalla Mountains 1963 topographic maps, paved Kaiser Road has been added, connecting Eagle Mountain with Desert Center, and crossing the southwest corner of the Solar Farm study area (USGS 1963a, 1963b). Kaiser Road was

constructed by Kaiser Steel Corporation between 1957 and 1963 to provide access to Eagle Mountain Mine and the town of Eagle Mountain. The paved road heads almost due north from I-10 for about six miles, where it bends gradually to the northwest and leads to Eagle Mountain. Seven Project components lie next to or cross Kaiser Road, including both Solar Farm site alternatives SF-B and -C, and all three of the Gen-Tie Line alternatives (GT-A-1, GT-A-2, and GT-B-2). SF-B and SF-C border Kaiser Road on the northeast side, where the road starts to bend to the northwest. All three of the Gen-Tie Lines cross the road at least once. The portion of the road that falls within and near the Project components was examined during the Class III survey. It is in good condition, with some signs of wear and aging but no prominent ruts or cracks. Six archaeological sites and four isolated finds were recorded within 150 feet of the road during the field survey. The sites include two survey markers *(P33-18240 and CA-RIV-9381), three historic-age refuse deposits (P33-18244, CA-RIV-9382, and P33-18253), and one historic-period mining prospect pit (P33-18246). The isolated finds are P33-18459, P33-18460, P33-18465, and P33-18467*, all of which are historic-age cans (ECORP 2010b).

MWD 230-kV Transmission Line and Power Line

The Metropolitan Water District of Southern California (MWD) Transmission Line and Power Line Road are also noted on maps as crossing the Solar Farm area. This transmission line and its associated dirt road were constructed by MWD in the late 1930s or early 1940s to bring power to the various pumping stations along the Colorado River Aqueduct. The line is constructed of single H-frame steel towers with cross supports. The line bisects the SF-B and SF-C. The portions of the transmission line and road that fall within and near the Project components were examined during the field survey. The line and road both appear to be in good condition. The road has been graded numerous times, as evidenced by the approximately two-foot high berms on either side of the road. One archaeological site *(P33-18333*, a historic-age refuse deposit) and one isolated find (*P33-18588*, a historic-age can) were recorded within 150 feet of the transmission line and road (ECORP 2010b).

Class III Survey

A Class III survey of 10,390.5 acres encompassing the Project components and alternatives was conducted to identify cultural resources that might be directly affected by Project construction, operation and maintenance, and decommissioning. Additional areas were examined within a five-mile buffer around the Project components to identify significant built environment resources that might be indirectly affected by visual or audible Project impacts. The field surveys were conducted in several phases between October 2009 and June 2010. Two small portions of Gen-Tie Line Alternatives A-1 and B-2 could not be surveyed as a result of access issues.

The Class III survey identified 67 previously unrecorded archaeological sites within the various alternative Project components being considered in addition to the 10 previously recorded sites identified in the Class I survey (the Class I and Class III surveys identified numerous additional resources within the larger Project Study Area). In addition to the sites identified, a number of isolated artifacts were found alone and not associated with archaeological sites. Historic-era resources dominate the inventory of archaeological sites while prehistoric-era resources dominate isolates. One multicomponent site (prehistoric and historic-era artifacts are represented) and two sites of indeterminate age were also recorded. Identified resources included prehistoric lithic scatters; rock rings; habitation sites; and isolated artifacts such as flakes, cores, and tools. Identified historic-era resources included refuse deposits; section and survey markers; mining-related sites (such as cairns, claim markers, prospect pits, and camp sites; World War II-era military features associated with the DTC; roads and road alignments; rock or fire rings; and isolated objects such as cans, utensils, bottles, auto parts, appliances and parts, and munitions and casings.

Resources Identified within Project Components

The following discussions and tables indicate sites identified within the various Project component alternatives as well as preliminary CRHR eligibility recommendations based on the Class I inventory and Class III survey results and observations. Several resources are included in multiple Project components due to the overlapping nature of those components. In addition to the resources listed below, the DTC-C-AMA and the less tangible historic landscapes of the surrounding extant resources identified by the Class I inventory extend into each of the Project components discussed below. These landscapes include:

- The Colorado River Aqueduct;
- The NRHP-listed North Chuckwalla Mountains Petroglyph District (CA-RIV-1383);
- The NRHP-listed North Chuckwalla Mountains Quarry Archaeological District (CA-RIV-1814); and
- The NRHP-eligible prehistoric site CA-RIV-330.

CRHR eligibility arguments and justification can be found in ECORP (2010b). The preliminary CRHR eligibility recommendations have not yet been concurred with by CPUC. NRHP eligibility determinations have not yet been made and will be *identified in the Memorandum of Agreement*, which is under development. For this analysis, all identified resources are presumed NRHP eligible unless previously determined or recommended to be ineligible. Although not listed below, all isolates (isolated artifacts in insufficient numbers to be considered an archaeological site) identified during the Class III survey are considered ineligible for both the CRHR and NRHP.

Solar Farm Site

No previously recorded cultural resources were documented within either of the considered Solar Farm site alternatives. However, numerous sites were identified by the Class III survey.

Solar Farm B. SF-B includes *21* sites (*16* historic, 3 prehistoric, 2 unknown-era). The sites are listed in Table 3.6-1.

Table 3.6-1
Cultural Resources Identified within Solar Farm Layout B

Site No.	Prehistoric / Historic	Description	NRHP Eligibility*	CRHR Eligibility Recommendation
Blythe-Eagle Mountain Transmission Line and Power Line Road	Historic	Transmission line and road	TBD	Potentially eligible
Kaiser Road	Historic	Road	TBD	Potentially eligible
P33-18228	Unknown	Two rock ring features	TBD	Potentially eligible
P33-18229	Unknown	Rock ring feature	TBD	Potentially eligible
P33-18231	Historic	Survey marker with rock cairn	TBD	Likely ineligible
CA-RIV-9373	Prehistoric	Lithic deposit	TBD	Potentially eligible

Table 3.6-1 (continued)
Cultural Resources Identified within Solar Farm Layout B

Site No.	Prehistoric / Historic	Description	NRHP Eligibility*	CRHR Eligibility Recommendation
CA-RIV-9374	Historic	Tank tracks	TBD	Potentially eligible as contributor to potential DTC historic district
CA-RIV-9375	Prehistoric	Lithic deposit	TBD	Potentially eligible
CA-RIV-9376	Historic	Tank tracks	TBD	Potentially eligible as contributor to potential DTC historic district
CA-RIV-9377	Historic	Tank tracks	TBD	Potentially eligible as contributor to potential DTC historic district
CA-RIV-9378	Prehistoric	Lithic deposit	TBD	Potentially eligible
CA-RIV-9379	Historic	Tank tracks	TBD	Potentially eligible as contributor to potential DTC historic district
P33-18239	Historic	Tank tread refuse deposit	TBD	Potentially eligible as contributor to potential DTC historic district
P33-18240	Historic	Road easement marker	TBD	Likely ineligible
CA-RIV-9380	Historic	Tank tracks	TBD	Potentially eligible as contributor to potential DTC historic district
P33-18333	Historic	Refuse deposit of cans	TBD	Likely ineligible
P33-18334	Historic	Berm-lined pit	TBD	Potentially eligible as contributor to potential DTC historic district
P33-18336	Historic	Prospect pit and spoils pile	TBD	Likely ineligible
CA-RIV-9474	Historic	WWII era ammunition deposit	TBD	Potentially eligible as contributor to potential DTC historic district
P33-18339	Historic	Los Angeles Department of Water and Power benchmark	TBD	Likely ineligible
CA-RIV-9475	Historic	Military campsite	TBD	Potentially eligible as contributor to potential DTC historic district

*NRHP *eligibility determinations will be identified in the Memorandum of Agreement*.
Source: ECORP (2009) and preliminary data from ECORP (IP)
TBD = To be determined.

Solar Farm C. SF-C includes *15* sites (*11* historic, 3 prehistoric, and 1 unknown-era). The sites are listed in Table 3.6-2.

Table 3.6-2
Cultural Resources Identified within Solar Farm Layout C

Site No.	Prehistoric / Historic	Description	NRHP Eligibility*	CRHR Eligibility Recommendation
Blythe-Eagle Mountain Transmission Line and Power Line Road	Historic	Transmission line and road	TBD	Potentially eligible
Kaiser Road	Historic	Road	TBD	Potentially eligible
P33-18229	Unknown	Rock ring feature	TBD	Potentially eligible
P33-18231	Historic	Survey marker with rock cairn	TBD	Likely ineligible
CA-RIV-9373	Prehistoric	Lithic deposit	TBD	Potentially eligible
CA-RIV-9374	Historic	Tank tracks	TBD	Potentially eligible as contributor to potential DTC historic district
CA-RIV-9375	Prehistoric	Lithic deposit	TBD	Potentially eligible
CA-RIV-9376	Historic	Tank tracks	TBD	Potentially eligible as contributor to potential DTC historic district
CA-RIV-9377	Historic	Tank tracks	TBD	Potentially eligible as contributor to potential DTC historic district
CA-RIV-9378	Prehistoric	Lithic deposit	TBD	Potentially eligible
CA-RIV-9379	Historic	Tank tracks	TBD	Potentially eligible as contributor to potential DTC historic district
P33-18239	Historic	Tank tread refuse deposit	TBD	Potentially eligible as contributor to potential DTC historic district
P33-18240	Historic	Road easement marker	TBD	Likely ineligible
CA-RIV-9380	Historic	Tank tracks	TBD	Potentially eligible as contributor to potential DTC historic district
P33-18334	Historic	Berm-lined pit	TBD	Potentially eligible as contributor to potential DTC historic district

*NRHP *eligibility determinations will be identified in the Memorandum of Agreement*.
Source: ECORP (2009) and preliminary data from ECORP (IP)
TBD = To be determined.

Transmission Line Corridors

Gen-Tie Line A-1. The GT-A-1 corridor includes *14* sites (*12* historic, 2 prehistoric), four of which were previously recorded. The sites are listed in Table 3.6-3.

Gen-Tie Line A-2. The GTA-2 corridor includes four sites (all historic). The sites are listed in Table 3.6-4.

Gen-Tie Line B-2. The GT-B-2 corridor includes *17* sites (all historic). The sites are listed in Table 3.6-5.

Table 3.6-3
Cultural Resources Identified within Gen-Tie Line A-1

Site No.	Prehistoric / Historic	Description	NRHP Eligibility*	CRHR Eligibility Recommendation
Kaiser Road	Historic	Road	TBD	Potentially eligible
P33-15093	Prehistoric	Lithic reduction concentration	TBD	Potentially eligible
P33-15095	Historic	Refuse deposit of cans	TBD	Potentially eligible
P33-17766	*Historic*	*U.S. Routes 60/70 and Associated Diversion Dikes*	*TBD*	*Potentially eligible*
P33-81244	Historic	Refuse deposit of cans	TBD	Likely ineligible
CA-RIV-9382	Historic	Refuse deposit of cans and glass	TBD	Likely ineligible
P33-18246	Historic	Circular excavated area	TBD	Likely ineligible
P33-18253	Historic	46-acre refuse deposit	TBD	*Likely ineligible*
CA-RIV-9390	Historic	Refuse deposit of cans and glass	TBD	Likely ineligible
P33-18271	Historic	Refuse deposit of cans and glass	TBD	*Likely ineligible*
P33-18291	Historic	Refuse deposit of cans	TBD	Likely ineligible
CA-RIV-9407	Prehistoric	Habitation site	TBD	Potentially eligible
P33-18299	Historic	Refuse deposit of cans, glass, ceramics	TBD	Likely ineligible
P33-18405	Historic	Rock cairn	TBD	Likely ineligible

*NRHP *eligibility determinations will be identified in the Memorandum of Agreement.*
Source: ECORP (2009) and preliminary data from ECORP (IP)
TBD = To be determined.

Table 3.6-4
Cultural Resources Identified within Gen-Tie Line A-2[1]

Site No.	Prehistoric / Historic	Description	NRHP Eligibility*	CRHR Eligibility Recommendation
Kaiser Road	Historic	Road	TBD	Potentially eligible
P33-17766	*Historic*	*U.S. Routes 60/70 and Associated Diversion Dikes*	*TBD*	*Potentially eligible*
P33-18299	Historic	Refuse deposit of cans, glass, ceramics	TBD	Likely ineligible
P33-18392	Historic	Refuse deposit of military artifacts	TBD	Potentially eligible as contributor to potential DTC historic district

[1]Survey crews could not access approximately five miles of this route, but it is likely that additional resources exist within this alternative route.
*NRHP *eligibility determinations will be identified in the Memorandum of Agreement*.
Source: ECORP (2009) and preliminary data from ECORP (IP)
TBD = To be determined.

Table 3.6-5
Cultural Resources Identified within Gen-Tie Line Route – Alternative B-2

Site No.	Prehistoric / Historic	Description	NRHP Eligibility*	CRHR Eligibility Recommendation
Kaiser Road	Historic	Road	TBD	Potentially eligible
Eagle Mountain Road	Historic	Road	TBD	Potentially eligible
P33-13987	Historic	Telegraph/telephone line	TBD	Likely ineligible
P33-15971	Historic	36th Evac. Hospital complex	TBD	Potentially eligible as contributor to potential DTC historic district
P33-17766	*Historic*	*U.S. Routes 60/70 and Associated Diversion Dikes*	*TBD*	*Potentially eligible*
P33-18244	Historic	Refuse deposit of cans	TBD	Likely ineligible
CA-RIV-9382	Historic	Refuse deposit of cans and glass	TBD	Likely ineligible
P33-18246	Historic	Circular excavated area	TBD	Likely ineligible
P3318376	Historic	Refuse deposit of cans	TBD	Likely ineligible
P33-18379	Historic	Refuse deposit of cans and milled lumber	TBD	Likely ineligible
P33-18380	Historic	Refuse deposit of cans	TBD	Likely ineligible
P33-18381	Historic	Refuse deposit of cans	TBD	Likely ineligible
P33-18382	Historic	Refuse deposit of cans	TBD	Likely ineligible
P33-18383	Historic	Refuse deposit of cans	TBD	Likely ineligible
P33-18384	Historic	Refuse deposit of cans	TBD	Potentially eligible as contributor to potential DTC historic district
P33-18385	Historic	Refuse deposit of cans and glass	TBD	*Likely ineligible*
P33-18386	Historic	Refuse deposit of cans and glass	TBD	Potentially eligible as contributor to potential DTC historic district

*NRHP *eligibility determinations will be identified in the Memorandum of Agreement*.
Source: ECORP (2009) and preliminary data from ECORP (IP)
TBD=To be determined.

Red Bluff Substation Sites

Red Bluff Substation A. The Red Bluff Substation A area includes *six* sites, all historic-era (Table 3.6-6). These totals include sites that would be affected by drainage features associated with the substation location. This does not include additional Project components associated with the Substation, such as access roads and a distribution line. These are discussed separately below (see Tables 3.6-7, 3.6-8, and 3.6-9). Several additional sites were recorded adjacent to the Substation boundary, and the area to the south is particularly sensitive for cultural resources. The Alligator Rock *Area of Critical Environmental Concern (ACEC),* designated for cultural resource value, does extend into Substation A. The status of the ACEC and impact on it are addressed in Sections 3.14 and 4.14 (Special Designations).

Table 3.6-6
Cultural Resources Identified within Red Bluff Substation A

Site No.	Prehistoric / Historic	Description	NRHP Eligibility*	CRHR Eligibility Recommendation
P33-17766	*Historic*	*U.S. Routes 60/70 and Associated Diversion Dikes*	*TBD*	*Potentially eligible*
CA-RIV-9414	Historic	Rock ring and rock cairn	TBD	Likely ineligible
CA-RIV-9416	Historic	Two rock cairns	TBD	Likely ineligible
CA-RIV-9418	*Historic*	*Two rock cairns*	*TBD*	*Likely ineligible*
P33-018394	*Historic*	*Rock cairn and four quartz reduction concentrations*	*TBD*	*Likely ineligible*
CA-RIV-9486	*Historic*	*Quartz reduction concentrations*	*TBD*	*Likely ineligible*

*NRHP *eligibility determinations will be identified in the Memorandum of Agreement*.
Source: ECORP (2009) and preliminary data from ECORP (IP)
TBD = To be determined

Table 3.6-7
Cultural Resources Identified within the Transmission Loop-In Line for the Red Bluff Substation A

Site No.	Prehistoric / Historic	Description	NRHP Eligibility*	CRHR Eligibility Recommendation
P33-018394	*Historic*	*Rock cairn and four quartz reduction concentrations*	*TBD*	*Likely ineligible*
P33-018413	*Historic*	*Quartz reduction concentrations*	*TBD*	*Likely ineligible*

*NRHP *eligibility determinations will be identified in the Memorandum of Agreement*.
Source: ECORP (2009) and preliminary data from ECORP (IP)
TBD = To be determined

Table 3.6-8
Cultural Resources Identified within Access Road Alternative 1 via Kaiser and Aztec Roads to Red Bluff Substation A

Site No.	Prehistoric / Historic	Description	NRHP Eligibility*	CRHR Eligibility Recommendation
P33-14201	Historic	Quartz reduction concentration and a refuse deposit of glass and cans	TBD	Likely ineligible
P33-17766	Historic	Original US 60/70 alignment and associated dikes	TBD	Potentially eligible
CA-RIV-9478	Historic	Four rock cairns and a refuse deposit of cans and glass	TBD	Likely ineligible
P33-18345	Historic	Six quartz reduction concentrations	TBD	Likely ineligible
P33-18349	Historic	Ten quartz reduction concentrations, two associated reduction pits, and a refuse deposit of cans and glass	TBD	Likely ineligible
P33-18351	Historic	Refuse deposit of cans	TBD	Likely ineligible
P33-18353	Historic	Four quartz reduction concentrations and a refuse deposit of cans	TBD	Likely ineligible

*NRHP *eligibility determinations will be identified in the Memorandum of Agreement.*
Source: ECORP (2009) and preliminary data from ECORP (IP)
TBD = To be determined.

Table 3.6-9
Cultural Resources Identified within Access Road Alternative 2 via Corn Springs Road and Chuckwalla Valley Road to Red Bluff Substation A

Site No.	Prehistoric / Historic	Site / Isolate	Description	NRHP Eligibility*	CRHR Eligibility Recommendation
P33-17766	Historic	Site	Original US 60/70 alignment and associated dikes	TBD	Potentially eligible

*NRHP *eligibility determinations will be identified in the Memorandum of Agreement*.
Source: ECORP (2009) and preliminary data from ECORP (IP)
TBD = To be determined.

Project components associated with the Red Bluff Substation A are the telecom site, a transmission loop-in line, two access roads, and a distribution line. These were also surveyed during the Class III survey. No resources were identified within the boundaries of the telecom site. *Two* historic site*s were* identified within the transmission loop-in line corridor (Table 3.6-7). The western access road corridor, via Kaiser Road and Aztec Road (Access Road Alternative 1), includes seven sites, all historic, including one previously recorded *likely* NRHP-ineligible site (Table 3.6-8). The access road corridor to the east of the substation via Corn Springs Road and Chuckwalla Valley Road (Access Road Alternative 2) includes one historic site (Table 3.6-9). The corridor for the distribution line includes 20 sites (18 historic, 1 prehistoric, and 1 multicomponent) (Table 3.6-10).

Table 3.6-10
Cultural Resources Identified within Distribution Line for Red Bluff Substation A

Site No.	Prehistoric / Historic	Description	NRHP Eligibility*	CRHR Eligibility Recommendation
CA-RIV-1383 (P33-01383)	Prehistoric	North Chuckwalla Mountains Petroglyph District (thirty-six cultural loci, including petroglyph concentrations, rock rings, cleared circles, trail fragments, flaked stone lithic deposits, bedrock milling features, deposited ceramics, and a rock cairn with an associated wooden cross.)	*Listed on* NRHP	*Listed on CRHR*
P33-14201	*Historic*	*Quartz reduction concentration and a refuse deposit of glass and cans*	*TBD*	*Likely ineligible*
P33-17766	Historic	Original US 60/70 alignment and associated dikes	TBD	Potentially eligible
CA-RIV-9415	Multicomponent	Prehistoric lithic deposit; historic mine shaft, two adits, two prospect pits, and one spoils pile	TBD	Potentially eligible
CA-RIV-9417	Historic	Two prospect pits, one fire hearth, two rock-lined depressions, three cleared areas, and a refuse deposit of cans	TBD	*Likely ineligible*
CA-RIV-9478	*Historic*	*Four rock cairns and a refuse deposit of cans and glass*	*TBD*	*Likely ineligible*
P33-18326	Historic	Rock ring	TBD	Likely ineligible
P33-18343	Historic	Four rock cairns and a refuse deposit of cans and glass	TBD	Likely ineligible
P33-18345	Historic	Six quartz reduction concentrations	TBD	Likely ineligible
P33-18349	Historic	Ten quartz reduction concentrations, two associated reduction pits, and a refuse deposit of cans and glass	TBD	Likely ineligible

Table 3.6-10 (continued)
Cultural Resources Identified within Distribution Line for Red Bluff Substation A

Site No.	Prehistoric / Historic	Description	NRHP Eligibility*	CRHR Eligibility Recommendation
P33-18350	Historic	Three quartz reduction concentrations, one extraction pit, and a refuse deposit of cans and glass	TBD	Likely ineligible
P33-18351	Historic	Refuse deposit of cans	TBD	Likely ineligible
P33-18352	Historic	Refuse deposit of cans and glass	TBD	Likely ineligible
P33-18353	Historic	Four quartz reduction concentrations and a refuse deposit of cans	TBD	Likely ineligible
P33-18356	Historic	Refuse deposit of cans and glass	TBD	Likely ineligible
P33-18360	Historic	USGS section marker and wooden post, both surrounded by rock cairns	TBD	Likely ineligible
P33-18394	Historic	Rock cairn and four quartz reduction concentrations	TBD	Likely ineligible
P33-18395	Historic	Rock hearth and a refuse deposit of cans and glass	TBD	Likely ineligible
CA-RIV-9482	Historic	Two quartz reduction concentrations	TBD	Likely ineligible
P33-18398	Historic	Four prospector's collection piles	TBD	Likely ineligible

*NRHP *eligibility determinations will be identified in the Memorandum of Agreement*.
Source: ECORP (2009) and preliminary data from ECORP (IP)
TBD = To be determined.

Red Bluff Substation B. The Red Bluff Substation B includes *six* sites (*four* historic and two prehistoric), as shown in Table 3.6-11. No sites were identified immediately next to this substation area. These totals include sites that would be affected by drainage features associated with the substation location. This does not include additional Project components associated with the substation, including one access road alternative and a distribution line. These are discussed separately below (see Tables 3.6-12 and 3.6-13).

Project components associated with the Red Bluff Substation B include one access road and a distribution line. These were also surveyed during the Class III survey. The distribution line and access road include the same two sites, both historic (Tables 3.6-12 and 3.6-13).

Table 3.6-11
Cultural Resources Identified within Red Bluff Substation B

Site No.	Prehistoric / Historic	Description	NRHP Eligibility*	CRHR Eligibility Recommendation
P33-17766	*Historic*	*Original US 60/70 alignment and associated dikes*	*TBD*	*Potentially eligible*
P33-18284	Historic	Rock hearth	TBD	Likely ineligible
CA-RIV-9404	Prehistoric	Lithic deposit	TBD	Potentially eligible
P33-18286	Prehistoric	Lithic deposit	TBD	Potentially eligible
P33-18389	Historic	Five quartz reduction concentrations	TBD	Likely ineligible
P33-18390	Historic	Quartz reduction concentration	TBD	Likely ineligible

*NRHP *eligibility determinations will be identified in the Memorandum of Agreement.*
Source: ECORP (2009) and preliminary data from ECORP (IP)
TBD = To be determined.

Table 3.6-12
Cultural Resources Identified within Distribution Line for Red Bluff Substation B

Site No.	Prehistoric/ Historic	Description	NRHP Eligibility*	CRHR Eligibility Recommendation
P33-13987	Historic	Telegraph/telephone line	TBD	Likely ineligible
P33-17766	*Historic*	*Original US 60/70 alignment and associated dikes*	*TBD*	*Potentially eligible*

*NRHP *eligibility determinations will be identified in the Memorandum of Agreement.*
Source: ECORP (2009) and preliminary data from ECORP (IP)
TBD = To be determined.

Table 3.6-13
Cultural Resources Identified within Access Road via Eagle Mountain Road to Red Bluff Substation B

Site No.	Prehistoric/ Historic	Description	NRHP Eligibility*	CRHR Eligibility Recommendation
P33-13987	Historic	Telegraph/telephone line	TBD	Likely ineligible
P33-17766	*Historic*	*Original US 60/70 alignment and associated dikes*	*TBD*	*Potentially eligible*

*NRHP *eligibility determinations will be identified in the Memorandum of Agreement.*
Source: ECORP (2009) and preliminary data from ECORP (IP)
TBD = To be determined.

3.7 PALEONTOLOGICAL RESOURCES

Paleontological resources constitute a fragile and nonrenewable scientific record of the history of life on earth. The BLM policy is to manage paleontological resources for scientific, educational, and recreational values and to protect these resources from adverse impacts. To accomplish this goal, the BLM ensures that proposed land uses that it initiates or authorizes do not inadvertently damage or destroy important paleontological resources on public lands.

To ensure the protection of paleontological resources, the BLM considers paleontological data as early as possible in the decision-making process for any project. As part of this ongoing consideration, the BLM collates existing information on paleontological resources and uses this information to classify the geologic formations present for their potential to contain vertebrate fossils or invertebrate or plant fossils that are scientifically important.

3.7.1 Applicable Plans, Policies, and Regulations

The major laws protecting paleontological resources on federal lands include the Paleontological Resources Preservation Act (PRPA) which was signed into law as part of the Omnibus Public Lands Management Act (OPLA) of 2009. The PRPA requires the Secretary of the Interior to manage and protect paleontological resources on federal land using scientific principles and expertise, and requires the BLM to develop appropriate plans for inventorying, monitoring, and the scientific and educational use of paleontological resources, in accordance with applicable agency laws, regulations, and policies. Where possible, these plans should emphasize interagency coordination and collaborative efforts with non-federal partners, the scientific community, and the general public.

Other major authorities protecting paleontological resources on federal lands are the Federal Land Policy and Management Act (FLPMA), NEPA, and various sections of BLM's regulations.

While paleontological resources are often discussed in parallel to or linked with historical and cultural resources in planning and environmental impact analyses, the identification and classification of paleontological resources is based on geologic units. On October 15, 2007, the BLM formalized the use of a new classification system for identifying fossil potential on public lands with the release of instruction memorandum IM 2008-009. The Potential Fossil Yield Classification (PFYC) system is based on the potential for the occurrence of significant paleontological resources in a geologic unit, and the associated risk for impacts to the resource based on federal management actions. Occurrences of paleontological resources are closely tied to the geologic units (i.e., formations, members, or beds) that contain them.

Using the PFYC system, geologic units are classified (Class 1 – Very Low through Class 5 – Very High) based on the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts, with a higher class number indicating a higher potential. It is used to set management policies and not intended to be applied to specific paleontological localities or small areas within units.

While they are being updated to reflect the requirements of the PRPA and the PFYC system, the BLM Manual 8270 and BLM Handbook H-8270-1 contain the agency's guidance for managing paleontological resources on public land. The manual has more information on the authorities and regulations related to paleontological resources. The handbook gives procedures for permit issuance,

requirements for qualified applicants, information on paleontology and planning, and a classification system for potential fossil-bearing geologic formations on public lands.

3.7.2 Existing Conditions

A region of several miles surrounding the proposed Project area was evaluated for the recorded presence of paleontological resources and the potential for the geologic units in the region to contain significant paleontological resources.

A Paleontology Literature and Records Review was conducted by the Division of Geological Sciences at the San Bernardino County Museum (SBCM) on November 1, 2009 (Division of Geological Sciences at the SBCM 2009). The review indicated that no fossils have been recorded within a several-mile radius of the Project Study Area.

Geologic Units

As discussed in Section 3.8, Geology and Soil Resources, the geologic units within the region include dunes sand (Qs), Holocene alluvium (Qal), Quaternary older alluvium (Qoa), Tertiary volcanic rock (Tv), Mezozoic granite rock (gr), and Mezozoic basic intrusive rock (bi). The Tertiary and Mesozoic rock have no potential for paleontological resources (Figure 3.8-1).

Only the Quaternary older alluvium has any potential to yield paleontological resources. Elsewhere in southern inland California, such older Pleistocene sediments have yielded fossil resources. The potential for this unit to contain paleontological resources is dependent on its depositional context and lithology. The Pleistocene alluvium (Quaternary older alluvium) in the Project area is composed of alluvium and fanglomerate with sediments possibly derived from the Brawley Formation or Ocotillo Conglomerate/Palm Springs Formations, which could themselves contain fossils (Division of Geological Sciences at the SBCM 2009).

The Brawley Formation and Ocotillo Conglomerate/Palm Springs Formations themselves do not occur within 10 miles of the proposed Project area. To be present in the region of the project, any fossil resources would have to have been eroded from these formations (i.e., separated from any depositional information and value), transported, and deposited with the sediments of the Quaternary older alluvium. This transport and deposition would result in fragmentation and reduction of any fossil resources of significant scientific value. Therefore, the recent Holocene alluvium (Qs and Qal) and the Pleistocene older alluvium (Qoa) at the surface in the region of the proposed Project have a low potential to contain significant fossil resources (Eberhart/United Consultants 2007). However, if there are any cohesive beds of fine-grained sediments with characteristics of lake or low-energy fluvial deposition lying unexposed beneath the surface, these beds could have a higher potential for paleontological resources.

3.8 GEOLOGY AND SOIL RESOURCES

This section describes the environmental and regulatory settings associated with the construction and operation of the proposed Project or its alternatives with respect to geology and soil resources within the Project Study Area.

3.8.1 Applicable Plans, Policies, and Regulations

Federal

International Building Code

The 2006 International Building Code (IBC) is a model building code developed by the International Code Council (ICC) that sets rules specifying the minimum acceptable level of safety for constructed objects such as buildings in the United States. As a model building code, the IBC has no legal status until it is adopted or adapted by government regulation. California has adopted the IBC. The IBC was developed to consolidate existing building codes into one uniform code that provides minimum standards to ensure the public safety, health and welfare insofar as they are affected by building construction, and to secure safety of life and property from all hazards incident to the occupancy of buildings, structures and premises. With some exceptions, the California Building Code (CBC) discussed below is based on the IBC.

Federal Land Policy and Management Act of 1976 as Amended

The Federal Land Policy and Management Act (FLPMA) establishes policy and goals to be followed in the administration of public lands by the BLM. The intent of FLPMA is to protect and administer public lands within the framework of a program of multi-use and sustained yield, and the maintenance of environmental quality. Particular emphasis is placed on the protection of the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resources and archaeological values. FLPMA is also charged with the protection of life and safety from natural hazards.

California Desert Conservation Area Plan

The CDCA Plan defines multiple use classes for BLM-managed lands in the CDCA, which includes land encompassing the proposed Project and alternatives. With respect to geological resources, the CDCA Plan aims to maintain the availability of mineral resources on public lands for exploration and development.

State of California

California Building Code

The California Building Code (2007) includes a series of standards that are used in project investigation, design, and construction (including grading and erosion control). The CBC 2007 Edition is based on the 2006 IBC as published by the ICC, with the addition of more extensive structural seismic provisions. Chapter 16 of the CBC contains definitions of seismic sources and the procedure used to calculate seismic forces on structures.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 regulates development and construction of buildings intended for human occupancy to avoid the hazard of surface fault rupture. This act provides mitigation against surface fault rupture of known active faults beneath occupied structures, and requires disclosure of the presence of any seismic faults to potential real estate buyers and a 50-foot setback for new occupied buildings. The Alquist-Priolo Earthquake Fault Zoning Act helps define where fault rupture is most likely to occur. This act groups faults into categories of active, potentially active, and inactive.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 directs the California Geological Survey to delineate seismic hazard zones. The purpose of this act is to reduce the threat to public health and safety, and to minimize the loss of life and property by identifying and mitigating seismic hazards. These seismic hazards include areas that are subject to the effects of strong ground shaking such as liquefaction, landslides, tsunamis and seiches. Cities, counties, and state agencies are directed to use seismic hazard zone maps developed by the California Geological Survey in their land use planning and permitting processes. This act requires that site-specific geotechnical investigations be performed prior to permitting most urban development projects within seismic hazard zones.

California Land Conservation Act of 1965

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, was enacted to preserve California's prime agricultural lands from urbanization. Since it was enacted, the act has been amended several times to allow its use not only to protect prime agricultural lands.

Riverside County

Riverside County General Plan

The Safety Element of the Riverside County General Plan provides for the mitigation of geologic hazards through a combination of engineering, construction, land use and development standards. The Safety Element addresses the geologic hazards present within the county, including fault rupture, ground shaking, liquefaction, seismically generated subsidence, seiche and dam inundation, landslides/mudslides, non-seismic subsidence, and erosion. Riverside County has prepared graphics that identify geologic hazards, including fault rupture, liquefaction hazards and landslide hazards (Riverside County 2003). Special consideration, including possible engineering/geologic evaluation, is required for developing sites designated on these maps. The Desert Center Area Plan also provides an overview of mitigations for geologic hazards in the Desert Center area.

Riverside County General Plan policies relating to fault rupture, seismicity, and seismic risk are as follows:

> S 2.1 Minimize fault rupture hazards through enforcement of Alquist-Priolo Earthquake Fault Zoning Act provisions and the following policy, among others: Require geologic studies or analyses for critical structures, and lifeline, high occupancy, schools, and high-risk structures within 0.5 miles of all Quaternary to historic faults shown on the Earthquake Fault Studies Zone map.

Riverside County General Plan policies related to liquefaction are as follows:

S 2.2 Require geological and geotechnical investigations in areas with potential for earthquake-induced liquefaction, landsliding or settlement as part of the environmental and development review process, for any structure proposed for human occupancy, and any structure whose damage would cause harm.

S 2.3 Require that a State-licensed professional investigate the potential for liquefaction in areas designated as underlain by "Susceptible Sediments" and "Shallow Groundwater" for all general construction projects.

S 2.7 Require a 100 percent maximum variation of fill depths beneath structures to mitigate the potential of seismically-induced differential settlement.

Riverside County General Plan policies related to ground subsidence are as follows:

S 3.8 Require geotechnical studies within documented subsidence zones as well as zones that may be susceptible to subsidence prior to the issuance of development permits.

S 3.10 Encourage and support efforts for long-term, permanent monitoring of topographic subsidence in all producing groundwater basins, irrespective of past subsidence.

Riverside County General Plan policies related to slope stability are as follows:

S 3.5 During permit review, identify and encourage mitigation of onsite and offsite slope instability, debris flows, and erosion hazards on lots undergoing substantial improvements.

S 3.6 Require grading plans, environmental assessments, engineering and geologic technical reports, irrigation, and landscaping plans, including ecological restoration and revegetation plans, as appropriate, in order to assure the adequate demonstration of a project's ability to mitigate the potential impacts of slope and erosion hazards and loss of native vegetation.

3.8.2 Existing Conditions

Topography

The Project site is located in a largely undeveloped, vacant, and relatively flat area in the Chuckwalla Valley of the Sonoran Desert in eastern Riverside County. The Desert Center region is surrounded by the Eagle, Coxcomb, and Chuckwalla Mountains. Sand dunes with native desert habitats compose most of the Desert Center planning area (Riverside County General Plan, Desert Center Area Plan 2003). *However, the Project area overlaps only a small portion of the Desert Center planning area, and no sand dunes are located within the Project area.* The Project area is underlain by alluvial sediments. Relict, old, or inactive dune deposits are scattered throughout the Project area (Kenney 2010).

Geology

Regional Geology

The proposed Project lies within the Mojave Desert geomorphic province (Norris and Web 1990), which is located in the westernmost part of the Basin and Range geomorphic province. The Mojave Desert geomorphic province is a broad interior region of isolated mountain ranges separated by expanses of desert plains. It as an interior enclosed drainage, with playas (or dry lake basins) being common. Fault trends largely control Mojave Desert topography. Mountain ranges in the Mojave Desert geomorphic province are composed of complexly faulted and folded basement rocks that range in age from pre-Cambrian (more than 570 million years before present [mybp]) to Mesozoic (66 to 240 mybp). Volcanic and sedimentary rocks deposited in the Cenozoic (less than 66 mybp to present) are common as well. Younger faulting in the eastern half of the Mojave Desert geomorphic province, where the Project is located, is characterized by generally north- to northwest-trending normal faults associated with regional extension in the Basin and Range province.

The Project components lie within the Chuckwalla Valley, which is bounded on the west by the Eagle Mountains, on the east by the Palen Mountains, and to the north by the Coxcomb Mountains. The Chuckwalla Mountains are to the south. The Chuckwalla Valley contains a thick sequence of Quaternary sedimentary deposits including Pleistocene fan deposits, Holocene alluvium, and dune sand. The bordering mountains expose primarily Precambrian metamorphic and Mesozoic granitic rocks. The Blue Cut and Pinto Mountain Fault Zones, north-northwest and approximately 5 and 28 miles, respectively, from the Project area, are the nearest significant faults. The San Andreas Fault is approximately 37 miles southwest of the Project location (Earth Systems Southwest 2010b).

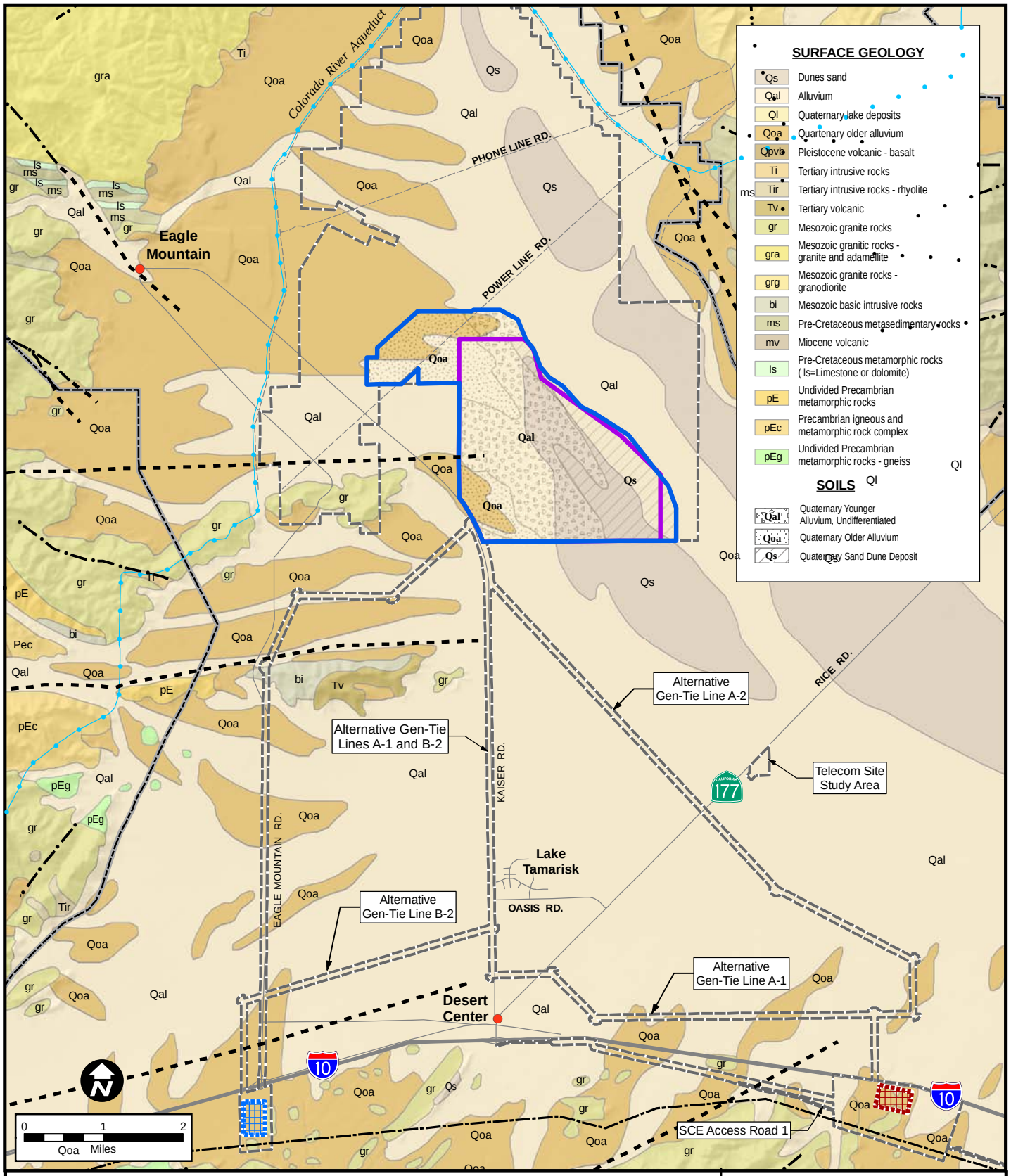
Local Geology

The predominant geologic units in the Project area are Pleistocene older alluvium, Holocene alluvium, and dune deposits. Older alluvium (Qoa), characterized as uplifted Pleistocene fan surfaces with well–developed desert pavement and incised drainage courses, is located primarily in the western portion of the Project (Figure 3.8-1). Holocene alluvium (Qal) is represented by the more recent braided stream channel deposits within the multitude of intermittent drainage channels that occur in the southern portion of the proposed Solar Farm and alternatives. Holocene dune sands (Qs) are located in the east and southeastern portions of the proposed Solar Farm and alternatives.

No active faults are mapped in the current footprint of the proposed and alternative Solar Farm, proposed or alternative Gen-Tie Lines, or proposed or alternative substations (Figure 3.8-1). Three concealed inactive faults, or faults whose position is inferred, are within the Project area (Figure 3.8-1). No active faults are known to exist within the Chuckwalla Valley area (Jennings 1994). The Blue Cut Fault Zone is the closest active fault zone and is approximately 7.2 miles north of the Project. Quaternary older alluvium and Holocene alluvium deposits are within the areas of the proposed transmission corridors (Figure 3.8-1). Both Red Bluff Substation alternatives are within Quaternary older alluvium, with minor amounts of Mesozoic granite rock outcrops (Figure 3.8-1).

Geologic Hazards

Geologic hazards that may affect the region include seismic hazards (ground shaking, surface fault rupture, soil liquefaction, and other secondary earthquake-related hazards), slope instability, ground subsidence, and erosion. Based on the geotechnical study for the Project (see Appendix F), a discussion follows on the specific hazards to the Project locations (Earth Systems Southwest 2010b).


X:\GIS\Desert_Sunlight\MXD_Files\geology.mxd
SURFACE GEOLOGY
Qs Dunes sand
Qal Alluvium
Ql Quaternary lake deposits
Qoa Quartenary older alluvium
Qpvb Pleistocene volcanic - basalt
Ti Tertiary intrusive rocks
Tir Tertiary intrusive rocks - rhyolite
Tv Tertiary volcanic
gr Mesozoic granite rocks
gra Mesozoic granitic rocks - granite and adamellite
grg Mesozoic granite rocks - granodiorite
bi Mesozoic basic intrusive rocks
ms Pre-Cretaceous metasedimentary rocks
mv Miocene volcanic
ls Pre-Cretaceous metamorphic rocks (ls=Limestone or dolomite)
pE Undivided Precambrian metamorphic rocks
pEc Precambrian igneous and metamorphic rock complex
pEg Undivided Precambrian metamorphic rocks - gneiss
SOILS
Qal Quaternary Younger Alluvium, Undifferentiated
Qoa Quaternary Older Alluvium
Qs Quaternary Sand Dune Deposit
Colorado River Aqueduct
PHONE LINE RD.
POWER LINE RD.
Eagle Mountain
Alternative Gen-Tie Line A-2
Alternative Gen-Tie Lines A-1 and B-2
Alternative Gen-Tie Line B-2
Alternative Gen-Tie Line A-1
KAISER RD.
EAGLE MOUNTAIN RD.
RICE RD.
OASIS RD.
Telecom Site Study Area
Lake Tamarisk
Desert Center
SCE Access Road 1
177
10
0 1 2
Qoa Miles
LEGEND
Fault-Approximate
Fault-Concealed-Inferred Location
Devers-Palo Verde Transmission Line (DPV1)
Desert Sunlight Study Area Boundary
Joshua Tree National Park Boundary
Solar Farm Boundary (Alternative B)
Solar Farm Boundary (Alternative C)
Red Bluff Substation (Alternative A)
Red Bluff Substation (Alternative B)
Notes: Adapted from Geologic Map of California, Salton Sea Sheet, 1997
2010 Earth Systems Southwest
DESERT SUNLIGHT SOLAR FARM
Figure 3.8-1
Regional Geology and Soils

Primary Seismic Hazards

Seismic Sources. Several active faults or seismic zones lie within 62 miles (100 kilometers) of the Project Study Area which includes the proposed Solar Farm, Gen-Tie Line, Substation, and their alternatives (Table 3.8-1). The primary seismic hazard to the site is strong ground shaking from earthquakes along the Pinto Mountain Fault north of the Project Study Area, the San Andreas Fault southwest of the Project Study Area, and the multitude of faults within the Eastern California Shear Zone.

Table 3.8-1
Regional Earthquake Faults

Fault Section Name	Distance		Avg. Dip Angle	Avg. Dip Direction	Avg. Rake[1]	Trace Length	Fault Type [2]	Mean Mag [3]	Mean Return Interval	Slip Rate
	(miles)	(km)	(deg.)	(deg.)	(deg.)	(km)			(years)	(mm/yr)
Blue Cut	7.2	11.6	90	177	NA	79	B'	7.1	--	--
Pinto Mtn.	35.9	57.8	90	175	0	74	B	7.2	--	2.5
Brawley, western edge of seismic zone	36.8	59.2	90	250	NA	60	B'	7.0	--	--
San Andreas (Coachella)	36.8	59.2	90	224	180	69	A	7.2	69	20
Brawley, eastern edge of seismic zone	38.0	61.2	90	250	NA	61	B'	7.0	--	--
Pisgah-Bullion Mtn.-Mesquite Lake	40.0	64.4	90	60	180	88	B	7.3	--	0.8
Elmore Ranch	44.2	71.1	90	310	0	29	B	6.6	--	1
San Andreas (San Gorgonio Pass-Garnet Hill)	48.2	77.6	58	20	180	56	A	7.6	219	10
San Andreas (North Branch, Mill Creek)	48.2	77.6	76	204	180	106	A	7.5	110	17
Calico-Hidalgo	48.2	78.2	90	52	180	117	B	7.4	--	1.8
So. Emerson-Copper Mtn.	49.5	79.6	90	51	180	54	B	7.0	--	0.6
Ludlow	49.6	79.8	90	239	NA	70	B'	7.0	--	--
Joshua Tree (Seismicity	51.6	83.1	90	271	NA	17	B'	6.5	--	--
Eureka Peak	54.3	87.3	90	75	180	19	B	6.6	--	0.6
San Jacinto (Clark)	56.5	90.9	90	214	180	47	A	7.6	211	14
Burnt Mtn.	56.8	91.4	67	265	180	21	B	6.7	--	0.6
Superstition Hills	61.6	99.1	90	220	180	36	A	7.4	199	4
Landers	62.4	100.4	90	60	180	95	B	7.4	--	0.6
San Jacinto (Borrego)	62.8	101.0	90	223	180	34	A	7.0	146	4
San Jacinto (Coyote Creek)	63.2	101.8	90	223	180	43	A	7.3	259	4
Imperial	63.5	102.1	82	55	180	46	A	6.8	89	20
Superstition Mountain	65.9	106.1	37	37	37	37	B	7.0	--	0.1
San Jacinto (Superstition Mountain)	66.0	106.3	90	210	180	26	B'	6.6	--	--

Table 3.8-1 (continued)
Regional Earthquake Faults

Fault Section Name	Distance		Avg. Dip Angle	Avg. Dip Direction	Avg. Rake[1]	Trace Length	Fault Type [2]	Mean Mag [3]	Mean Return Interval	Slip Rate
Hector Mine	66.3	106.8	90	246	NA	28	B'	6.7	--	--
Mission Creek	67.7	109.0	65	5	180	31	B'	6.9	--	--
San Jacinto (Anza)	67.9	109.3	90	216	180	46	A	7.6	151	18
Johnson Valley North	68.5	110.3	90	51	180	35	B	6.8	--	0.6
North Frontal (East)	71.8	115.6	41	187	90	27	B	6.9	--	0.5
Earthquake Valley (Southern Extension)	76.2	122.7	90	204	180	9	B'	6.3	--	--
Earthquake Valley	78.4	126.1	90	217	180	20	B	6.7	--	2
San Gorgonio Pass	79.0	127.1	60	11	NA	29	B'	6.9	--	--
Lenwood-Lockhart-Old Woman Springs	79.1	127.2	90	43	180	145	B	7.5	--	0.9
Elsinore (Coyote Mountain)	79.7	128.3	82	35	180	39	A	7.1	322	3
Laguna Salada	81.4	131.0	90	41	180	99	A	6.8	89	3.5
San Andreas (San Bernardino South)	81.4	131.0	90	210	180	43	A	7.6	150	16
Earthquake Valley (North Extension)	81.6	131.3	90	221	180	33	B'	6.9	--	--
Elisnore (Julian)	82.1	132.1	84	36	180	75	A	7.6	725	3
Cerro Prieto	82.7	133.1	90	221	NA	84	B'	7.2	--	--
San Jacinto (San Jacinto Valley, step over)	86.0	138.4	90	224	180	24	A	7.4	199	9
San Jacinto (Anza, step over)	86.8	139.6	90	224	180	25	A	7.6	151	9

[1]Rake: The angle between the horizontal and any linear feature, e.g., an ore shot or lineation, measured in the plane containing the linear feature
[2]Type-A faults have known slip rates and paleo-seismic estimates of recurrence interval. Type-B faults have observed slip rates.
[3]USGS 2008
Source: Working Group on California Earthquake Probabilities, Special Report 203, Appendix A, Earth Systems Southwest 2010b.

Three unnamed faults have been mapped by the California Geologic Survey trending in an east-west direction through the Project area. These faults are shown as buried, are poorly defined, and are not considered active or a significant source of seismic activity (Figure 3.8-1).

Surface Fault Rupture. The Project is not within a currently delineated Alquist-Priolo Earthquake Fault Zone (Hart 1997). Well delineated active fault lines cross through the region, as shown on California Geological Survey maps (Jennings 1994); however, no active faults are mapped in the immediate vicinity of the Project locations. Therefore, active fault rupture is unlikely to occur at the Project site. While fault rupture would most likely occur along previously established fault traces, future fault rupture also could occur at other locations.

Historic Seismicity and Seismic Risk. Approximately 32 earthquakes of magnitude 5.5 or greater have occurred within 70 miles of the Project area since 1800 (Earth Systems Southwest 2010). These include the 1948 Desert Hot Springs earthquake (Magnitude [M] 6.0), the 1949 Pinto Mountains earthquake (M5.0), and the 1992 Joshua Tree earthquake (M6.1) that was an aftershock of the Landers earthquake. All three earthquakes occurred within the San Andreas Fault system, which is closest to the Project Study Area.

While accurate earthquake predictions are not possible, various agencies have conducted statistical risk analyses. In 2008, the California Geological Survey and the US Geological Survey (USGS) completed probabilistic seismic hazard maps. Earth Systems Southwest (2010b) completed an evaluation of the seismic risk at the Project locations. The recent report by the Working Group of California Earthquake Probabilities (2008) estimated a 58 percent conditional probability that an M6.7 or greater earthquake may occur between 2008 and 2038 along the southern segment of the San Andreas Fault. The southern segment of the San Andreas Fault appears to originate near the Salton Sea and bends to the northwest, along the southern base of the San Bernardino Mountains, through the Tejon Pass, and then along the northern base of the San Gabriel Mountains.

The primary seismic risk at the site is a potential earthquake along the San Andreas Fault that is about 37 miles from the site and is considered as fault Type A (Working Group on California Earthquake Probabilities 2008). Geologists at the USGS believe that the San Andreas Fault has characteristic earthquakes that result from rupture of each fault segment. The estimated characteristic earthquake is M7.7 for the southern segment, as detailed earlier for the San Andreas Fault (US Geological Survey 2008). This segment has the longest elapsed time since rupture of any part of the San Andreas Fault. The last rupture occurred about 1680, based on dating by the USGS near Indio (Working Group on California Earthquake Probabilities 2008). This segment has also ruptured on or around 1020, 1300, and 1450, with an average recurrence interval of about 220 years. The San Andreas Fault may rupture in multiple segments, producing a higher magnitude earthquake. Recent paleo-seismic studies suggest that the San Bernardino Mountain Segment to the north and the Coachella Segment, both found within the southern segment of the San Andreas Fault system, may have ruptured together in 1450 and 1690 (Working Group on California Earthquake Probabilities 2008).

Site Acceleration. The potential intensity of ground motion may be estimated by the horizontal peak ground acceleration, measured in "g" forces (g is equivalent to the acceleration due to Earth's gravity, or 9.81 meters per second squared). Ground motions depend primarily on the earthquake magnitude and distance to the rupture zone. Accelerations also depend on attenuation by rock and soil deposits, direction of rupture, and type of fault. For these reasons, ground motions may vary considerably in the same general area. This variability can be expressed statistically by a standard deviation about a mean relationship. Important factors influencing the structural performance are the duration and frequency of strong ground motion, local subsurface conditions, soil-structure interaction, and structural details. The probabilistic estimates for peak ground acceleration based on a risk of a 10 percent exceedance in 50 years is approximately 0.24 meters per second per second for an earthquake with a recurrence time (equivalent return period) of 476 years (California Geologic Survey 2001, revised 2003).

The probabilistic peak ground acceleration, taken from the seismic hazard maps and data covering the Project area, can be estimated (California Geological Survey 2002, revised 2003). The risk would

be a 10 percent exceedance in 50 years, the equivalent return period would be 476 years, and the peak ground acceleration would be approximately 0.24 g, based on Site Class B/C and soil amplification factor of 1.0 for Site Class D (Earth Systems Southwest 2010b).

2007 California Building Code Seismic Coefficients. The CBC seismic design parameters criteria are based on a Design Earthquake that has an earthquake ground motion two-thirds of the lesser of 2 percent probability of occurrence in 50 years or 150 percent of mean deterministic limit. The peak ground acceleration estimate given above is provided for information on the seismic risk inherent in the CBC design.

Seismic Hazard Zones. The site lies in a moderate liquefaction potential zone designated by Riverside County because of high susceptibility sediments (Riverside County 2003). This portion of Riverside County has not been mapped under the California Seismic Hazard Mapping Act (California Public Resources Code 1991). The Project Study Area has a relatively gentle topography and the potential for a large-scale landslide is considered negligible. The occurrence of debris flows and surficial failures within incised drainage channels is considered likely (Earth Systems Southwest 2010b).

Secondary Seismic Hazards. Secondary seismic hazards related to ground shaking generally include soil liquefaction, ground subsidence, slope instability, tsunamis, and seiches.

Soil Liquefaction. Liquefaction is the loss of soil strength from sudden shock (usually earthquake shaking), causing the soil to become a fluid mass. In general, for the effects of liquefaction to be manifested at the surface, groundwater levels must be within 50 feet of the ground surface and the soils within the saturated zone must also be susceptible to liquefaction. The potential for liquefaction to occur in the Project area is considered negligible because the depth of groundwater beneath the site is thought to exceed 50 feet. No free groundwater was encountered in test pits dug to a total depth of 10 feet below ground surface, completed during the geotechnical survey of the proposed Solar Farm and alternatives areas. While the Project lies in a zone designated by Riverside County for sediments susceptible to liquefaction (Riverside County 2003), undocumented depths to groundwater resulted in the assumed moderate liquefaction potential. Water level data from a well located approximately two miles southwest of the Solar Farm area suggest static water levels in excess of 100 feet, with historic shallow water levels greater than 60 feet (Earth Systems Southwest 2010b).

Ground Subsidence. The site is within a Riverside County-designated "susceptible" subsidence zone (Riverside County 2003). Dry sands tend to settle and compact when subjected to strong earthquake shaking. The amount of subsidence is dependent on relative density of the soil, ground motion, and earthquake duration. Uncompacted fill areas of the site may be susceptible to seismically induced settlement.

Slope Instability. The site has relatively gentle topography, such that the potential for large-scale landslides is considered negligible. The occurrence of local surficial failures and debris flows within and along incised drainage channels is considered likely.

Tsunamis and Seiches. The site is far inland, and there are no water storage reservoirs on or near the site, so the hazards from tsunamis and seiches are considered negligible.

Other Geologic Hazards

Water Erosion

The site is relatively flat and undisturbed, with sparse native desert vegetation. Drainage paths within the Project area are poorly defined to nonexistent, with drainage by sheet flow in a northwest-to-southwest direction (Earth Systems Southwest 2010b). There are no perennial streams within the Project area. Three ephemeral washes are within the study area but outside the proposed Solar Farm area. Pinto Wash, Big Wash, and Eagle Creek are ephemeral streams originating north and west of the Project Study Area (Figure 3.17-3). The Project locations are in an area where sheet flooding and erosion could occur, with localized flooding within the defined drainage channels during seasonal precipitation and flash flood events. Appropriate Project design, construction, and maintenance would minimize flooding potential.

Wind Erosion

An analysis of aeolian (or wind-driven) sand migration for the Chuckwalla Valley includes the proposed Project area (Kenney 2010). Only very minor active aeolian sand deposits exist within the site. These are associated with mobilized sand from the local washes in the Project Study Area but outside the Project area. They are not associated with the regional aeolian sand corridor of the Clarks Pass system, which extends from Dale Dry Lake to just east of Ford Dry Lake, 20 miles northwest of the Project Study Area (Kenney 2010).

As stated earlier, relict, old, or inactive dune deposits are scattered throughout the Project. Due to the paucity of sand sources, the potential is low for aeolian or wind-driven sand erosion in the Project Study Area and the areas of the proposed Project and alternatives (Kenney 2010).

Soil Resources

Soils associated with the proposed Solar Farm area were surveyed on December 10, 2009, as part of the geotechnical survey (Earth Systems Southwest 2010b). The soil units encountered during the geotechnical survey consist of sand dune deposit, younger alluvium, and older alluvium. The older alluvium was slightly moist, likely due to winter rain infiltration and in a medium dense to dense condition, while the sand dune deposits were generally soft and dry. Soils south of the Project area were surveyed by the Natural Resources Conservation Service (1993). The survey area was associated with agricultural lands found next to Rice Road, within the GT-A-2 corridor and approximately four miles south of the Solar Farm area. The draft survey results classified those soils as gravelly loamy coarse sands (Carsitas series) and loamy sands (Rositas series). A typical description for both the Carsitas and Rositas soils series provided by the NRCS indicates that these soils do not have a topsoil horizon (Natural Resources Conservation Service 1993). Soils are described as having C horizons from 0 to 60 inches below grade, indicating that soil-forming activity in these soils is primarily absent. The water erosion hazard for soils classified as Carsitas series has been determined to be slight, and the windblown erosion hazard for those soils is considered to be severe. The water erosion hazard for soils classified as Rositas soil series has also been determined to be slight, and the windblown erosion hazard is considered to be severe (Natural Resources Conservation Service 1993).

While no prime farmland soils were identified in the survey conducted by the NRCS, Riverside County has identified soils in one component of the Project, GT-A-2, where it crosses Rice Road, as

Williamson Act Non-Prime Agricultural Land (California Department of Conservation, Division of Land Resources Protection 2007). These are lands that are enrolled in a California Land Conservation Act contract and do not meet the criteria as Prime Agricultural Land. Non-Prime Farmland is defined as open space land of statewide significance under the California Open Space Subvention Act. Most non-prime lands are in agricultural uses, such as grazing or non-irrigated crops. Non-prime lands may also include other open space uses that are compatible with agriculture and consistent with local general plans (California Department of Conservation, Division of Land Resources Protection 2007). Although soils associated with the Project have not been surveyed by the NRCS, the geotechnical survey of the site suggests that the soils found on the Project area were essentially uniform in nature and primarily sandy in texture, similar to the soils found in the agriculture lands adjacent to Rice Road.

Geotechnical testing of soils collected during field investigation in December 2009 exhibited a range of low to very severe resistivity, resulting in a potential for electrochemical corrosion for metal in contact with soil, and requiring corrosion protection or sacrificial thickness for any underground utilities. Site soils were classified as having a very low expansion potential (Earth Systems Southwest 2010b).

Desert pavement is covered with closely packed, interlocking angular or rounded rock fragments of pebble and cobble size. The rock fragments are covered with a dark varnish typically due to manganese oxides. Several theories have been proposed for their formation. The more common theory is that they are formed by the gradual removal of the sand, dust, and other fine-grained material by the wind and intermittent rain, leaving only the larger fragments behind. However, this does not continue indefinitely because, once the pavement has been formed, it can act as a barrier to further erosion (Wood et al. 2002). Approximately 20 percent of the Solar Farm area has been determined to have various stages of desert pavement (weak, moderate, and strong) (Earth Systems Southwest 2010a).

Soils and sediments are composed of minerals and organic materials in various ratios, derived from ambient conditions of the location within the landscape, vegetation type, rainfall, and the geologic materials that the soils were derived from. The mineral portion of a soil consists of a ratio of sand, silt, and clay identified as soil texture. Soils contain naturally occurring background levels of metals derived from the factors influencing soil formation. Table 3.8-2 presents concentration ranges and mean values of inorganics in selected surface soils of the United States. Most of the contribution is due to natural and regional/global sources originating from human activity (Breckenridge and Crockett 1995). The soil types presented are general but cover many of the major categories found in the United States, including desert soils.

Table 3.8-2
Concentrations of Inorganics in Surface Soils of the United States in Parts per Million

	Elements											
	Arsenic		Barium		Cobalt		Chromium		Copper		Mercury	
Soil Type	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean
Desert soils	1.2-18.1	6.4	300-2,000	835	3-20	10.0	10-200	60	5-100	24	0.02-0.32	0.06 (1)
Sandy soils and lithosols[2] on sandstones	<0.1-30.0	5.1	20-1,500	400	0.4-20	3.5	3-200	40	1-70	14	<0.01-0.54	0.08
Loamy soils	0.4-31.0	7.3	70-1,000	555	3-30	7.5	10-100	55	3-70	25	0.01-0.60	0.07
Loess and soils on silt deposits	1.9-16.0	6.6	200-1,500	675	3-30	11.0	10-100	55	7-100	25	0.02-0.38	0.08
Clay and clay loamy soils	1.7-27.0	7.7	150-2,500	535	3-30	8.0	20-100	55	7-70	29	0.01-0.09	0.13
Alluvial soils	2.1-22.0	8.2	200-1,500	660	3-20	9.0	15-100	55	5-50	27	0.02-0.15	0.05
Soils over granites and gneisses	0.7-15.0	3.6	300-1,500	785	3-15	6.0	10-100	45	7-70	24	0.01-0.14	0.06
Soils over volcanic rocks	2.1-11.0	5.9	500-1,500	770	5-50	17.0	20-700	85	10-150	41	0.01-0.18	0.05
Soils over limestones and calcareous rocks	1.5-21.0	7.8	150-1,500	520	3-20	9.5	5-150	50	7-70	21	0.01-0.50	0.08
Soils on glacial till and drift	2.1-12.0	6.7	300-1,500	765	5-15	7.5	30-150	80	15-50	21 (1)	0.02-0.36	0.07
Silty prairie soils	2.0-12.0	5.6	200-1,500	765	3-15	7.5	20-100	50	10-50	20 (1)	0.02-0.06	0.04 (1)

Table 3.8-2 (continued)
Concentrations of Inorganics in Surface Soils of the United States in Parts per Million

	Elements											
	Manganese		Nickel		Lead		Selenium		Strontium		Zinc	
Soil Type	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean
Desert soils	150-1,000	360	7-150	22.0	10-70	23	<0.1-1.1	0.5	70-2,000	490	25-150	52.5
Sandy soils and lithosols on sandstones	7-2,000	345	<5-70	13.0	<10-70	17	0.005-3.5	0.5[1]	5-1,000	125	<5-164	40.0
Loamy soils	50-1,000	480	5-200	22.0	<10-50	20	0.02-1.2	0.33[1]	10-500	175	20-118	55.0
Loess and soils on silt deposits	50-1,500	525	5-30	17.0	10-30	19	0.02-0.7	0.26[1]	20-1,000	305	20-109	58.5
Clay and clay loamy soils	50-2,000	580	5-50	20.5	10-70	22	<0.1-1.9	0.5	15-300	120	20-220	67.0
Alluvial soils	150-1,500	405	7-50	19.0	10-30	18	<0.1-2.0	0.5	50-700	295	20-108	58.5
Soils over granites and gneisses	150-1,000	540	<5-50	18.5	10-50	21	<0.1-1.2	0.4	50-1,000	420	30-125	73.5
Soils over volcanic rocks	300-3,000	840	7-150	30.0	10-70	20	0.1-0.5	0.2	50-1,000	445	30-116	78.5
Soils over limestones and calcareous rocks	70-2,000	470	<5-70	18.0	10-50	22	0.1-1.4	0.19[1]	15-1,000	195	10-106	50.0
Soils on glacial till and drift	200-700	475	10-30	18.0	10-30	17[1]	0.2-0.8	0.4	100-300	190	47-131	64.0[1]
Silty prairie soils	150-1,000	360	7-150	22.0	10-70	23	<0.1-1.1	0.5	70-2,000	490	25-150	52.5

Parts per million= Milligrams per kilogram. Sample results were calculated on a dry weight basis.
[1]Result for the whole soil profile sampled.
[2]Lithosols are soils with no zones that consist of unweathered or partially weathered rock fragments and are usually associated with steep slopes and bedrock outcrops.
Source: Kabata-Pendias and Pendias 1984

3.9 LANDS AND REALTY

3.9.1 Applicable Plans, Policies, and Regulations

This section discusses the applicable regulations, plans, and policies that govern land use within the Project Study Area and the surrounding area.

California Desert Conservation Area Plan and Northern and Eastern Colorado Desert Coordinated Management Plan

The principal land use plans affecting the Project are the BLM's CDCA Plan of 1980, as amended, and the NECO Plan, a 2002 amendment to the CDCA. The CDCA and NECO Plans are described in Section 1.3 of Chapter 1.

Riverside County Integrated Plan and Desert Center Area Plan

The principal land use plan affecting private land within the Project is the Riverside County General Plan (General Plan), which articulates the vision and planning principles for development in Riverside County. The Desert Center Area Plan (DCAP) is part of the General Plan and provides a more focused development plan for the Desert Center area, which includes the Project area. In addition, the General Plan defines development policies for the Desert Center Policy Area, which is generally between Desert Center and Lake Tamarisk.

Current Riverside County plans, policies, and regulations do not take into account the County's significant solar resource. However, the County recognizes that its current General Plan does not address siting utility-scale solar facilities and that policy conflicts may exist. The County plans to address siting of solar plants and will clarify these issues in a General Plan update and in future County Code revisions (CEC and BLM 2010).

3.9.2 Existing Conditions

The affected environment for land use consists of the existing and reasonably foreseeable land uses in the Project area. Land use can be assessed by analyzing current land activities, land ownership, zoning (where applicable), and land use designations in adopted land use plans and policies. An assessment of land use must also consider legal guarantees or limitations on land use, such as those provided by easements, deeds, ROW, claims, leases, licenses, and permits. BLM-administered lands are not zoned, but they may be encumbered by easements, ROWs, mining claims, and permits.

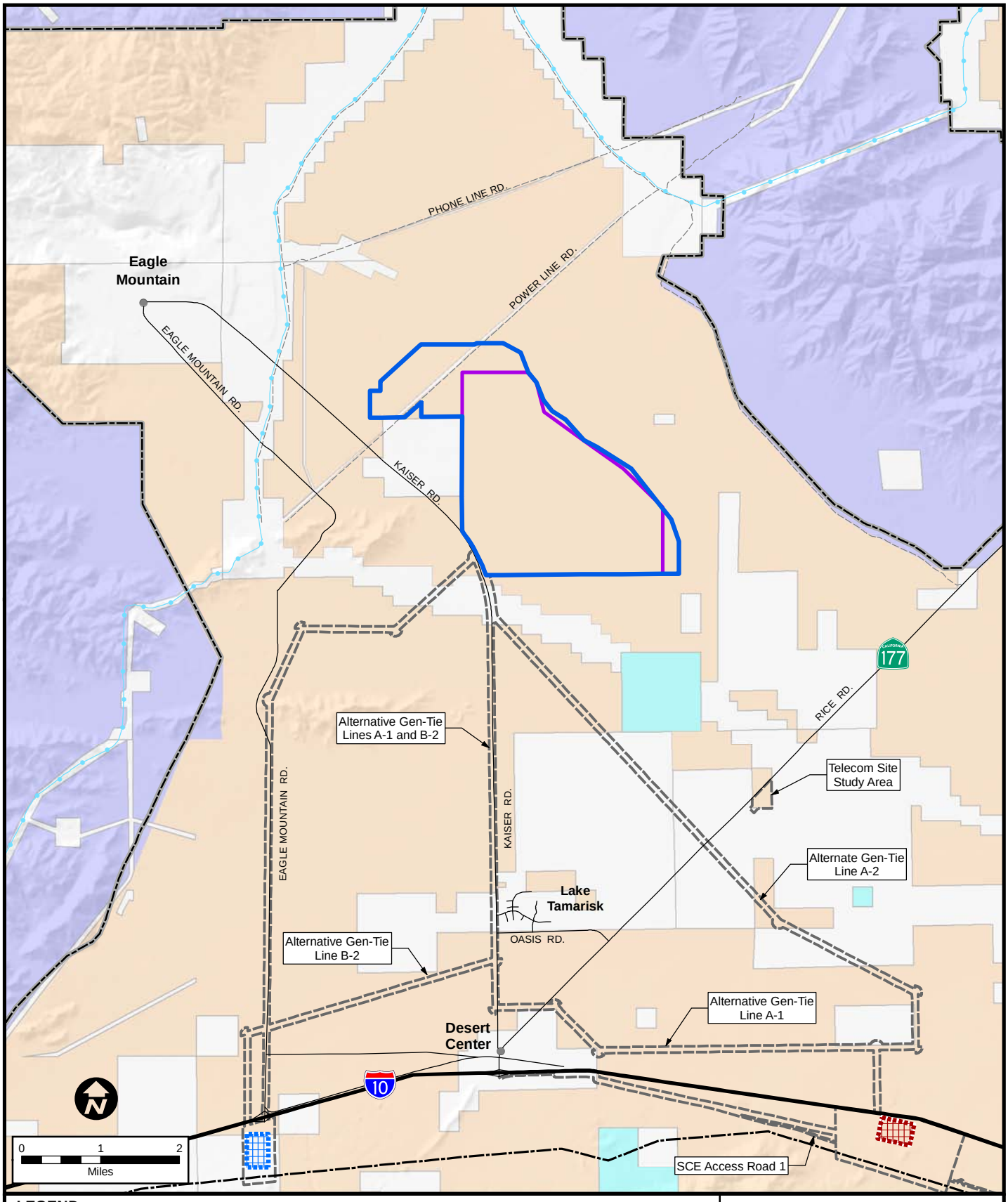
General Characteristics of Land in the Project Area

The Project area is largely a vacant, undeveloped, and relatively flat open space area located in the Chuckwalla Valley of the Sonoran Desert in eastern Riverside County. Development in the surrounding area includes the rural community of Desert Center, California; Lake Tamarisk Desert Resort; and the Eagle Mountain Mine. Joshua Tree National Park, which is managed by the National Park Service and is largely designated as wilderness, surrounds the majority of the Project to the west, north, and east. The general characteristics of the Project area are described in Chapter 1.

Land Ownership/Management

Figure 3.9-1 depicts the current land ownership in the Project area, as reported by the BLM (BLM 2009). Most of the Project would be on land that is under the jurisdiction of the BLM. Small

X:\GIS\Desert_Sunlight\MXD_Files\Ownership.mxd



LEGEND

Land Ownership / Management

- Bureau of Land Management
- National Park Service
- State
- Private

- Solar Farm Boundary (Alternative B)
- Solar Farm Boundary (Alternative C)
- Red Bluff Substation (Alternative A)
- Red Bluff Substation (Alternative B)
- Aqueduct
- Devers-Palo Verde Transmission Line (DPV1)

Source: BLM, May 2009.

DESERT SUNLIGHT SOLAR FARM

Figure 3.9-1

Land Ownership/ Management

portions of the Project would overlap private land (Table 3.9-1). Where the Project would be located on BLM-administered land, BLM land use designations established in the CDCA and NECO Plans would apply. Where the Project would be located on private land, the Riverside County General Plan designations and zoning would apply *as those portions of the Project are not under the jurisdiction of the CPUC*.

Portions of GT-A-1, GT-A-2, and GT-B-2 would traverse private land. All three Gen-Tie Line alternatives would cross one parcel owned by the Metropolitan Water District of Southern California (MWD). GT-A-1 and GT-B-2 would also cross one parcel of private land near Lake Tamarisk. GT-A-2 would cross 5.1 miles of private land. Red Bluff Substation B would be entirely on private land. Red Bluff Substation A and the Solar Farm alternatives would be entirely on BLM-administered land, as would the telecom site associated with the Red Bluff Substation. Table 3.9-1 provides information about private land ownership in the Project area.

Table 3.9-1
Land Ownership in the Project Area

Project Component	Private Land Crossed	Assessor Parcel Numbers
SF-B	None	Not applicable
SF- C	None	Not applicable
GT-A-1	0.6 mile	807171005, 808161001
GT-A-2	5.1 miles	807172029, 811270001, 811142005, 811141011, 811260013, 811170013, 811170018, 811170017, 811170016, 808250015, 808250016, 808250005, 808240010, 808240008, 808240007, 811170019, 808250014, 808250003, 808240011, 808240012, 808250004
GT-B-2	0.6 mile	808161001
Red Bluff Substation A, including access roads and distribution line	None	Not applicable
Red Bluff Substation B	100 percent	80813006
Telecom Site (associated with Red Bluff Substation)	None	Not applicable

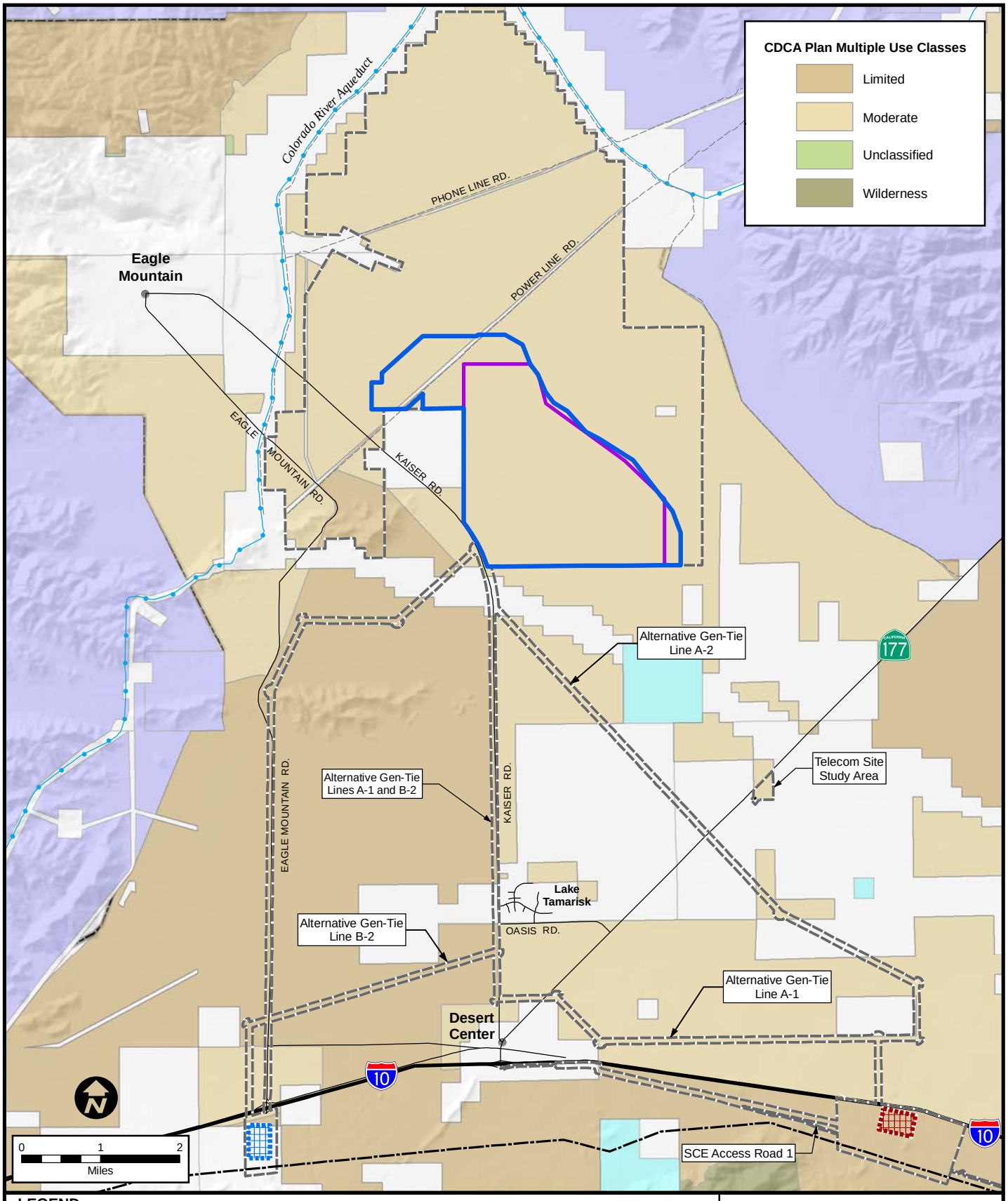
Source: First Solar 2009, 2010

BLM Land Use Designations

The BLM's CDCA establishes four multiple use classes, multiple use class guidelines, and plan elements for specific resources or activities, such as motorized vehicle access, recreation, and vegetation. Figure 3.9-2 depicts the multiple use classes assigned to BLM-administered land in the Project area, as designated in the NECO Plan. The multiple use classes are defined as follows:

- Class C (Controlled Use)—About 2.1 million acres designated Class C are managed to be preserved in a natural state; access generally is limited to nonmotorized and nonmechanized means, such as by foot or on horseback.
- Class L (Limited Use)—About 5.9 million acres designated Class L are managed to protect sensitive, natural, scenic, ecological, and cultural resource values. They provide for generally lower intensity, carefully controlled, multiple uses that do not significantly diminish resource values.

X:\GIS\Desert_Sunlight\MXD_Files\MUC2.mxd



LEGEND

- Desert Sunlight Study Area Boundary
- Solar Farm Boundary (Alternative B)
- Solar Farm Boundary (Alternative C)
- Devers-Palo Verde Transmission Line (DPV1)
- Red Bluff Substation (Alternative B)
- Red Bluff Substation (Alternative A)
- National Park Service
- State
- Private/Unclassified

Source: BLM, 2010.

DESERT SUNLIGHT SOLAR FARM

Figure 3.9-2

BLM Multiple Use Classes

- Class M (Moderate Use)—About 3.3 million acres designated Class M are managed in a controlled balance between higher intensity use and protection. A wide variety of uses such as mining, livestock grazing, recreation, energy, and the development of new utility facilities are allowed.
- Class I (Intensive Use)—About 500,000 acres are Class I, managed for concentrated use to meet human needs. Reasonable protection is provided for sensitive natural values. Impacts are mitigated and impacted areas are rehabilitated, when possible.

Both Solar Farm alternatives, most of GT-A-1 and GT-A-2, and portions of GT-B-2 would be located on land designated BLM Multiple Use Class M (Moderate Use). Most of GT-B-2 and Red Bluff Substation A would be on land designated BLM Multiple Use Class L (Limited Use).

Riverside County General Plan Land Use Designations

Where the Project would be located on private land, the Riverside County General Plan land use designations would apply. Figure 3.9-3 depicts the land use designations on private land in the Project area as reported in the General Plan (Riverside County 2003). In addition, all of the private land that the proposed Project would overlap is subject to Riverside County ordinances, the *Desert Center Area Plan (*DCAP*)*, and the Desert Center Policy Area (where said land is within the policy area).

A 0.6-mile section of GT-A-1 and GT-B-2, 5.1 miles of GT-A-2, and the entire Red Bluff Substation B would be on private land designated as "Open Space-Rural (OS-RUR)." According to the General Plan:

> The Open Space-Rural land use designation is applied to remote, privately owned open space areas with limited access and a lack of public services. Single-family residential uses are permitted at a density of one dwelling unit per 20 acres. The extraction of mineral resources subject to an approved surface mining permit may be permissible, provided that the proposed project can be undertaken in a manner that is consistent with maintenance of scenic resources and views from residential neighborhoods and major roadways and that the project does not detract from efforts to protect endangered species (Riverside County 2003).

Relevant land use policies of the General Plan for Open Space-Rural (OS-RUR) are as follows:

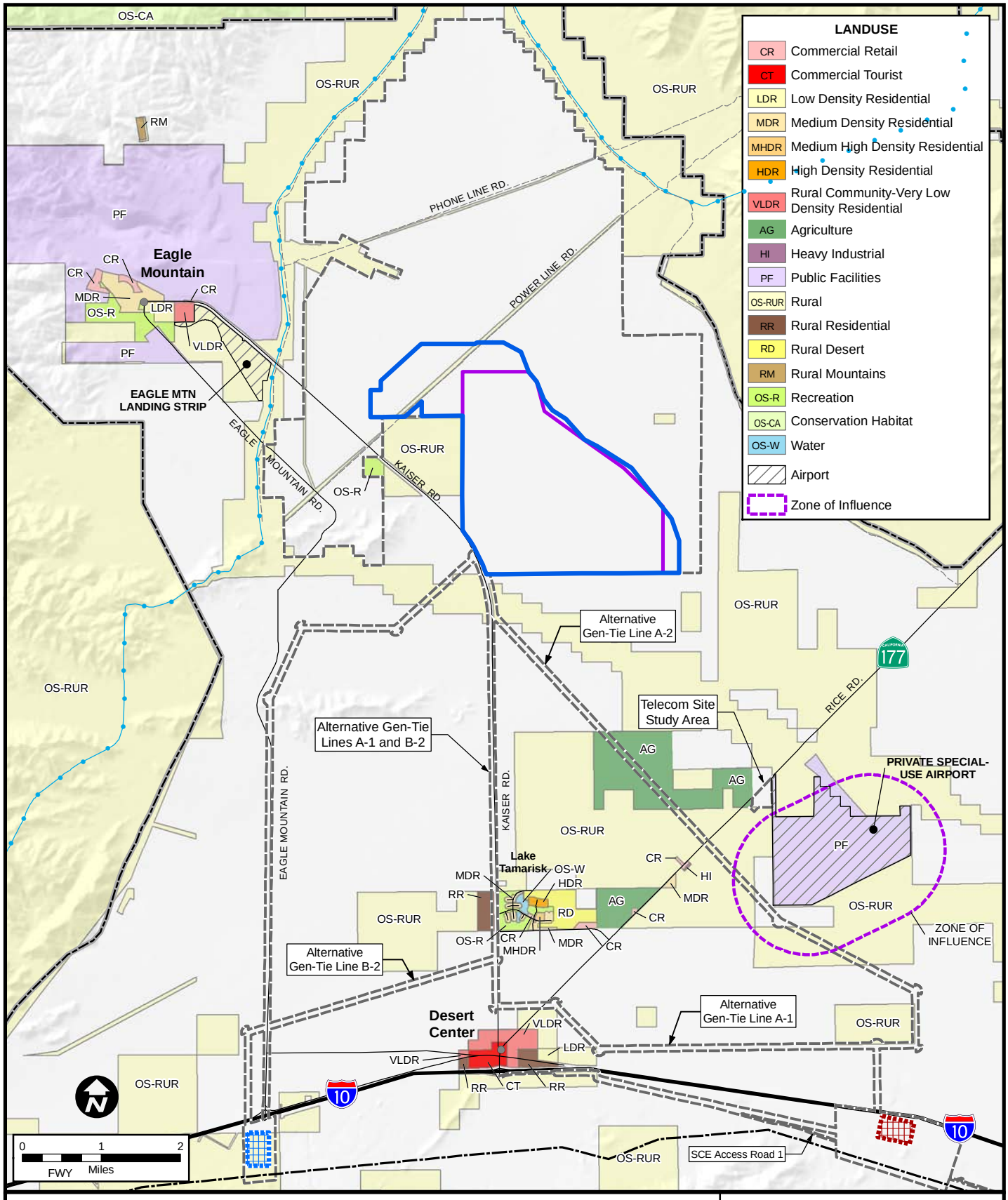
LU 20.1 Require that structures be designed to maintain the environmental character in which they are located.

LU 20.2 Require that development be designed to blend with undeveloped natural contours of the site and avoid an unvaried, unnatural, or manufactured appearance.

LU 20.3 Require that adequate and available circulation facilities, water resources, sewer facilities, and/or septic capacity exist to meet the demands of the proposed land use.

LU 20.4 Ensure that development does not adversely impact the open space and rural character of the surrounding area.

LU 20.6 Provide programs and incentives that allow Open Space-Rural areas to maintain and enhance their existing and desired character (Riverside County 2003).


X:\GIS\Desert_Sunlight\MXD_Files\Land Use 2.mxd
LANDUSE
CR Commercial Retail
CT Commercial Tourist
LDR Low Density Residential
MDR Medium Density Residential
MHDR Medium High Density Residential
HDR High Density Residential
VLDR Rural Community-Very Low Density Residential
AG Agriculture
HI Heavy Industrial
PF Public Facilities
OS-RUR Rural
RR Rural Residential
RD Rural Desert
RM Rural Mountains
OS-R Recreation
OS-CA Conservation Habitat
OS-W Water
Airport
Zone of Influence
Eagle Mountain
EAGLE MTN LANDING STRIP
PHONE LINE RD.
POWER LINE RD.
EAGLE MOUNTAIN RD.
KAISER RD.
RICE RD.
Alternative Gen-Tie Line A-2
Alternative Gen-Tie Lines A-1 and B-2
Alternative Gen-Tie Line B-2
Alternative Gen-Tie Line A-1
Telecom Site Study Area
PRIVATE SPECIAL-USE AIRPORT
ZONE OF INFLUENCE
Lake Tamarisk
Desert Center
SCE Access Road 1
0 1 2
FWY Miles
LEGEND
Desert Sunlight Study Area Boundary
Solar Farm Boundary (Alternative B)
Solar Farm Boundary (Alternative C)
Red Bluff Substation (Alternative A)
Red Bluff Substation (Alternative B)
BLM Land
Joshua Tree National Park Boundary
Devers-Palo Verde Transmission Line (DPV1)
Aqueduct
Adapted from: Riverside County Integrated Plan, 2003.
DESERT SUNLIGHT SOLAR FARM
Figure 3.9-3
Riverside County General Plan Land Use Designations

GT-A-2 would also traverse approximately 1.5 miles of land designated Agriculture (AG). According to the General Plan:

> The Agriculture land use designation has been established to help conserve productive agricultural lands within the County. These include row crops, nurseries, citrus groves and vineyards, dairies, ranches, poultry and hog farms, and other agricultural related uses. Areas designated for Agriculture generally lack an infrastructure that is supportive of urban development (Riverside County 2003).

Relevant land use policies of the General Plan for Agriculture (AG) are as follows:

LU 16.1 Encourage retaining agriculturally designated lands where agricultural activity can be sustained at an operational scale, where it accommodates lifestyle choice, and in locations where impacts to and from potentially incompatible uses, such as residential uses, are minimized, through incentives such as tax credits.

LU 16.2 Protect agricultural uses, including those with industrial characteristics (dairies, poultry, hog farms, etc.) by discouraging inappropriate land division in the immediate proximity and allowing only uses and intensities that are compatible with agricultural uses.

LU 16.4 Encourage conservation of productive agricultural lands. Preserve prime agricultural lands for high-value crop production.

LU 16.5 Continue to participate in the California Land Conservation Act (the Williamson Act) of 1965.

LU 16.6 Require consideration of State agricultural land classification specifications when a 2.5-year Agriculture Foundation amendment to the General Plan is reviewed that would result in a shift from an agricultural to a non-agricultural use.

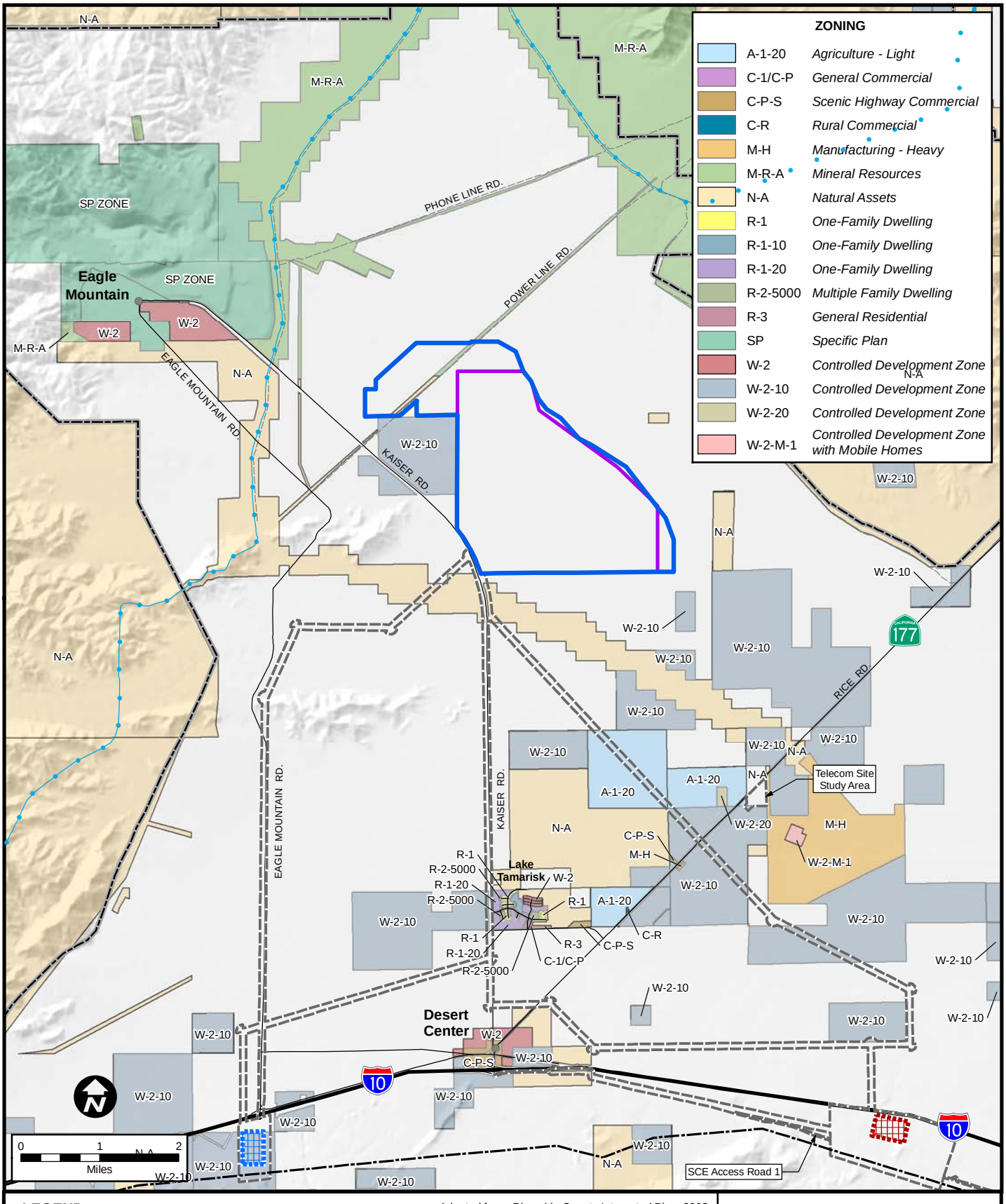
LU 16.7 Adhere to Riverside County's Right-to-Farm Ordinance (Riverside County 2003).

Riverside County Zoning

Where the Project would be located on private land, Riverside County zoning would apply. Figure 3.9-4 depicts the zoning on private land in the Project area as reported in the General Plan. Zoning classifications are defined in the Riverside County Land Use Ordinance, Ordinance 348, as amended, Article III. The ordinance details all permitted uses on private property based on the assigned zone classification.

GT-A-2 would cross and Red Bluff Substation B would be entirely on private land zoned as Controlled Development Zone (W-2-10). Permitted uses include single-family dwellings, field and tree crops, outside storage of materials, and limited animal husbandry. Limited additional uses are permitted where the lot size is greater than one acre. Many additional uses are allowed by approval or by permit, including "structures and the pertinent facilities necessary and incidental to the development and transmission of electrical power" (Riverside County 2009).

X:\GIS\Desert_Sunlight\MXD_Files\Zoning2.mxd



LEGEND

- Solar Farm Boundary (Alternative B)
- Solar Farm Boundary (Alternative C)
- Red Bluff Substation (Alternative A)
- Red Bluff Substation (Alternative B)
- Joshua Tree National Park Boundary
- Devers-Palo Verde Transmission Line (DPV1)
- Aqueduct
- BLM Land

Adapted from: Riverside County Integrated Plan, 2003.

DESERT SUNLIGHT SOLAR FARM

Figure 3.9-4

Riverside County Zoning

GT-A-2 would also overlap private land zoned Agriculture, Light (A-1-20). As the name implies, a variety of agricultural land uses are permitted here. No power-generating facilities are permitted, but, in accordance with Section 13.1(11)(d), the Planning Director can approve uses that are deemed to be "substantially the same in character and intensity" as the listed uses (Riverside County 2009).

A 0.6-mile portion of GT-A-1 and GT-B-2 would overlap one parcel of private land near Lake Tamarisk zoned Natural Assets (N-A). Permitted uses in areas zoned Natural Assets include some dwellings and accessory buildings, field and tree crops, grazing subject to stated limitations, and apiaries. Several other uses, including utility substations, are allowed by approval or by permit (Riverside County 2009).

3.9.3 Existing Uses

Lands and Realty-Related Uses

A number of easements, ROWs, and claims related to utility corridors, transmission lines, telephone lines, pipelines, railroads, roads, water transmission facilities, and mining claims are located in the Project area. These are shown on Figures 3.9-5 through 3.9-7 and in Tables 3.9-2 and 3.9-3.

The Project would overlap three major transmission lines. The Kaiser 33-kilovolt (kV) transmission line, owned by Kaiser Ventures, runs parallel to Kaiser Steel Road. South of the Kaiser 33-kV line, a 230-kV transmission line and a 33-kV distribution line run southwest to northeast along Power Line Road; both lines are owned by the MWD. Several of the proposed Gen-Tie Lines would cross SCE's existing 161-kV transmission line, which runs northwest to southeast. In addition, the DPV1 transmission line runs parallel to I-10. There are a number of smaller distribution lines that overlap project components as well.

In addition to ROW for existing roads and transmission lines, the Project would overlap two designated two-mile-wide utility corridors, labeled "E" and "K" (Figure 3.9-5). The northern portion of the Solar Farm area and a portion of GT-B-1 would overlap utility corridor "E." The proposed Red Bluff Substation alternatives and portions of all of the Gen-Tie Line alternatives would overlap utility corridor "K."

There are also multiple ROWs for existing underground oil and gas pipelines and telephone cables in the vicinity of the Red Bluff Substation alternatives, as well as a ROW for a gas distribution pipeline, which parallels Kaiser Road. There are two Federal Energy Regulatory Commission (FERC) easements for the Eagle Mountain Pump Storage Project (First Solar 2009).

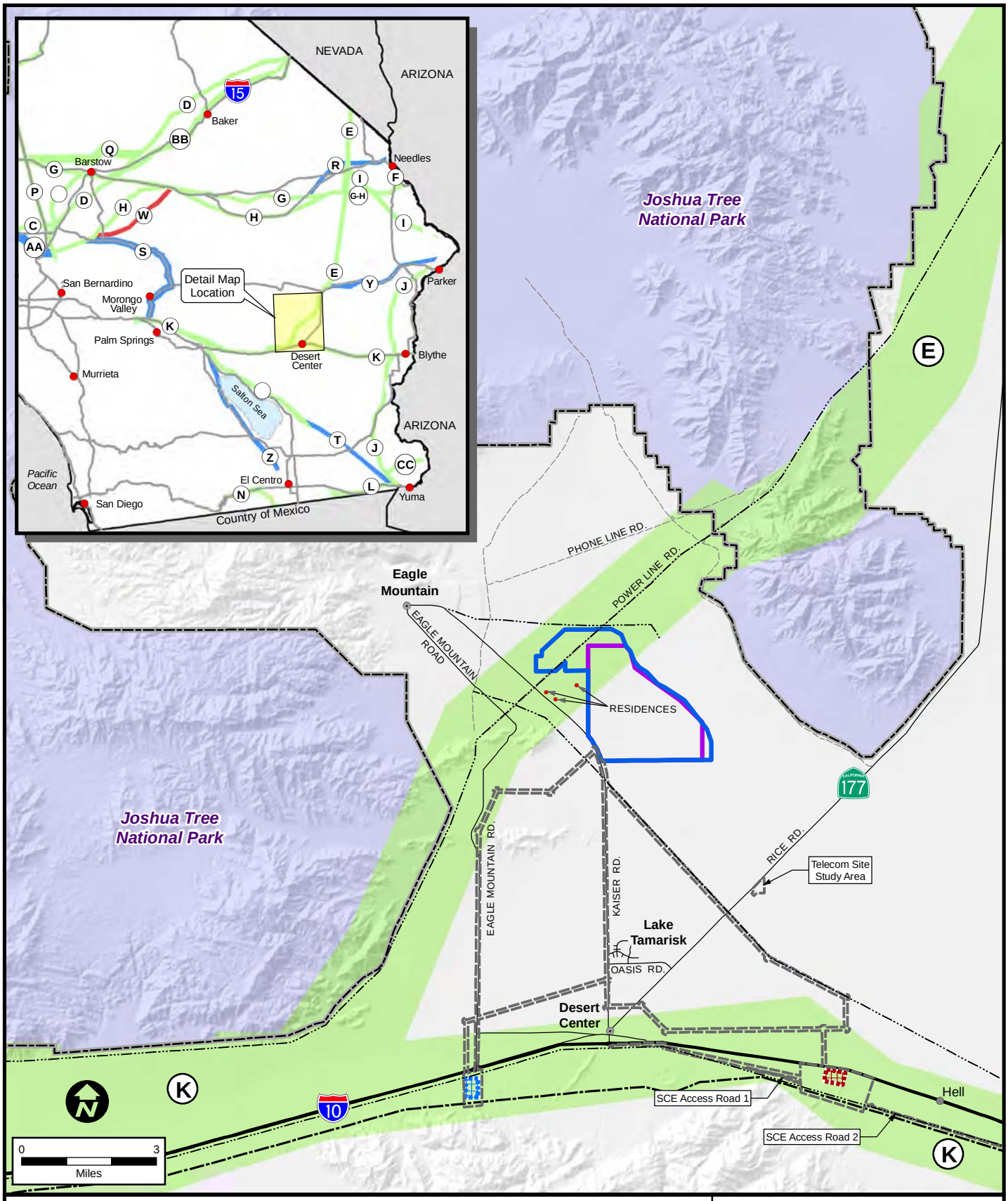
The Colorado River Aqueduct, owned by MWD, traverses in a northeast to southwest direction through the Colorado Desert. It is outside the Project area to the west and north.

Twelve water wells and associated pipelines are within the vicinity of the Solar Farm. Two of the wells are owned by Kaiser Steel and the others are owned by private parties.

West of GT-B-2 and Kaiser Road, the Riverside County Waste Management Department leases 160 acres from the BLM for a sanitary landfill[1]. The lease, serial number CAS005340, was authorized in 1975 (BLM and USFS 2010). Land disturbance is evident in this area (Google Earth 2010).

[1] Specific plans for a sanitary landfill are approved but are not currently in effect.

X:\GIS\Desert_Sunlight\MXD_Files\Utility Corridors2.mxd



LEGEND

BLM Utility Corridor
(Approximate Location)

- Designated Corridor
- Contingent Corridor (see inset)
- Deleted Corridor (see inset)
- Existing Transmission Lines
- Devers-Palo Verde Transmission Line (DPV1)
- Solar Farm Boundary (Alternative B)
- Solar Farm Boundary (Alternative C)
- Red Bluff Substation (Alternative A)
- Red Bluff Substation (Alternative B)

Source:
BLM, *California Desert Conservation Area Plan, 1980.*

DESERT SUNLIGHT SOLAR FARM

Figure 3.9-5

Utility Corridors and Existing Transmission Facilities

X:\GIS\DESERT_SUNLIGHT\AUTOCAD\ROW_SOLAR_FARM.DWG

APPROX. CL 400' ROW
METROPOLITAN WATER DIST.
230 kV TRANSMISSION LINE (1)

EXISTING WELL

POWER LINE ROAD

APPROX. 100' ROW
KAISER STEEL
ROAD &
TRANSMISSION LINE (3)

APPROX. CL 80' ROW
METROPOLITAN WATER DIST.
33 kV TRANSMISSION LINE
PARALLEL 230kV TRANSMISSION
LINE (2)

EXISTING WELL

APPROX. CL 100' EASEMENT
FEDERAL ENERGY REGULATION
COMMISSION EAGLE MOUNTAIN
PUMP STORAGE (4)

KAISER ROAD

APPROX. CL
(5) 300' RIVERSIDE COUNTY ROW
KAISER ROAD

METROPOLITAN WATER DISTRICT
WATER CONVEYANCE

1000 500 0 1000

LEGEND

- SOLAR FARM SITE BOUNDARY (ALTERNATIVE B)
- SOLAR FARM SITE BOUNDARY (ALTERNATIVE C)
- EXISTING ROAD
- EXISTING TRANSMISSION LINE
- EXISTING UNDERGROUND UTILITY
- US BUREAU OF LAND MANAGEMENT LAND
- US NATIONAL PARK SERVICE LAND
- PRIVATE PROPERTY

SOURCE: FIRST SOLAR, 2010.

NATIONAL SYSTEM OF PUBLIC LANDS
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

DESERT SUNLIGHT SOLAR FARM

Figure 3.9-6

Existing Lands and Realty-Related Uses: Solar Farm Alternatives

X:\GIS\DESERT_SUNLIGHT\AUTOCAD\ROW_GEN-TIE.DWG

METROPOLITAN WATER DIST. WATER CONVEYANCE

SOLAR FARM SITE BOUNDARY AND FENCE LINE

6 METROPOLITAN WATER DIST. ROW FOR DITCHES AND CANALS

8 APPROX. LOCATION RIVERSIDE COUNTY WASTE MANAGEMENT DEPT. LANDFILL EASEMENT

APPROX. CL 100' ROW SOUTHERN CALIFORNIA EDISON TRANSMISSION LINE 7

APPROX. CL 25' ROW SOUTHERN CALIFORNIA EDISON TRANSMISSION LINE 9

5 APPROX. CL 300' RIVERSIDE COUNTY ROW KAISER ROAD

PROPOSED TELECOM SITE

APPROX. CL 100' ROW CALIFORNIA DEPT. OF TRANSPORTATION STATE HIGHWAY 177 10

EAGLE MOUNTAIN ROAD

KAISER ROAD

DESERT CENTER/RICE ROAD/STATE HIGHWAY 177

APPROX. CL 25' ROW SOUTHERN CALIFORNIA EDISON TRANSMISSION LINE 9

APPROX. CL 50' ROW SOUTHERN CALIFORNIA GAS CO. UNDERGROUND GAS AND OIL PIPELINE 18

AT&T REPEATER STATION 26

APPROX. CL 250' ROW SOUTHERN CALIFORNIA GAS CO. UNDERGROUND GAS AND OIL PIPELINE 17

APPROX. CL 6' ROW SOUTHERN CALIFORNIA EDISON UNDERGROUND CABLE 25

APPROX. LOCATION CALIFORNIA DEPT. OF TRANSPORTATION DRAINAGE EASEMENTS 13

RAGSDALE ROAD

APPROX. CL 50' ROW SOUTHERN CALIFORNIA GAS CO. WATER PIPELINE AND WELL 11

APPROX. CL 12' ROW PRIVATE ACCESS ROAD 12

APPROX. CL 15' ROW SPRINT COMMUNICATIONS UNDERGROUND TELEPHONE CABLE 19

APPROX. LOCATION CALIFORNIA DEPT. OF TRANSPORTATION DRAINAGE EASEMENTS 13

APPROX. LOCATION SCE 10' ROW POLES AND ANCHORS 27

RED BLUFF SUBSTATION LOCATION

APPROX. CL 200' ROW CALIFORNIA DEPT. OF TRANSPORTATION INTERSTATE 10 20

APPROX. CL 15' ROW SPRINT COMMUNICATIONS UNDERGROUND TELEPHONE CABLE 19

APPROX. CL 10' ROW SOUTHERN CALIFORNIA EDISON TELEPHONE CABLE 15

RED BLUFF SUBSTATION LOCATION

APPROX. CL 50' ROW SOUTHERN CALIFORNIA GAS CO. UNDERGROUND GAS AND OIL PIPELINE 23

APPROX. CL 40' ROW AT&T UNDERGROUND TELEPHONE CABLE 16

APPROX. CL 50' ROW SOUTHERN CALIFORNIA GAS CO. UNDERGROUND GAS AND OIL PIPELINE 18

APPROX. CL 40' ROW AT&T UNDERGROUND TELEPHONE CABLE 16

APPROX. CL 260' ROW SOUTHERN CALIFORNIA EDISON DPV1 TRANSMISSION LINE 14

APPROX. CL 260' ROW SOUTHERN CALIFORNIA EDISON DPV TRANSMISSION LINE 14

APPROX. CL 15' ROW SPRINT COMMUNICATIONS UNDERGROUND TELEPHONE CABLE 19

APPROX. CL 15' ROW LA SIERRA UNIVERSITY ACCESS ROAD 24

APPROX. CL 50' ROW SOUTHERN CALIFORNIA GAS CO. UNDERGROUND GAS AND OIL PIPELINE 17

2500 1250 0 2500

LEGEND

- GEN-TIE CORRIDOR
- EXISTING TRANSMISSION LINE
- EXISTING ROAD
- EXISTING UNDERGROUND UTILITY
- STATE LAND
- US BUREAU OF LAND MANAGEMENT LAND
- US NATIONAL PARK SERVICE LAND
- PRIVATE PROPERTY

SOURCE: FIRST SOLAR, 2010.

NATIONAL SYSTEM OF PUBLIC LANDS
U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT

DESERT SUNLIGHT SOLAR FARM

Figure 3.9-7

Existing Lands and Realty-Related Uses: Gen-Tie Line and Substation Alternatives

Table 3.9-2
Existing Uses, Easements, and ROW Relative to the Solar Farm Alternatives

Owner	Use	Width (feet)	Location Relative to the Project	BLM Serial File Number
MWD	230-kV transmission line	400	Along Power Line Road; all Solar Farm alternatives would overlap.	LA 052058
MWD	33-kV transmission line	80	Along Power Line Road; all Solar Farm alternatives would overlap.	LA 051206
Kaiser Steel	Kaiser Steel Road and transmission line	100	The northern portion of SF-B would overlap.	R 05089
FERC	Easement for Eagle Mountain Pumped Storage Project	100	Along Kaiser Road; southwest corner under all Solar Farm alternatives would overlap.	CA 044243

Source: First Solar 2010

Table 3.9-3
Existing Uses, Easements, and ROW Relative to the Gen-Tie Line Alternatives

Owner	Use	Width (feet)	Location Relative to the Project	BLM Serial File Number
Riverside County	Kaiser Road	300	Kaiser Road easement; Gen-Tie Lines A-1, B-1, and B-2 would cross.	Not applicable
MWD	ROW for ditches and canals	Not applicable	South of Solar Farm boundary overlapping Kaiser Road; all Gen-Tie Lines would cross.	R 07041
SCE	Transmission line	100	Northwest to southeast east of Kaiser Road; all Gen-Tie Lines would cross; GT-A-2 would parallel it for much of its length.	LA 0149780
SCE	Transmission line	25	Northwest to southeast east of Kaiser Road; all Gen-Tie Lines would cross; GT-A-2 would parallel it for much of its length.	LA 0153144
Caltrans	I-10	200	Road easement; all Gen-Tie lines would cross.	Not applicable
Caltrans	SR-177 (Desert Center Rice Road)	100	Road easement; Gen-Tie Lines A-1 and A-2 would cross.	Not applicable
SCE	Water pipeline and well	50	GT-A-1 would cross.	LA 098376
Sprint	Underground telephone cable	15	All Gen-Tie Lines would cross.	CA 18888
Private owner	Private access road	12	GT-A-1 would cross and parallel for part of its length.	CA 37076
Caltrans	Drainage easements	Not applicable	GT-B-2 would cross near I-10.	R 05498 and R01732
Kaiser Ventures, Inc.	Eagle Mountain Railroad	200	No Project components would cross.	Not applicable

Table 3.9-3 (continued)
Existing Uses, Easements, and ROW Relative to the Gen-Tie Line Alternatives

Owner	Use	Width (feet)	Location Relative to the Project	BLM Serial File Number
Riverside County	Eagle Mountain Road	80	Road easement; GT-B-2 would cross.	Not applicable
Southern California Gas Company	Underground oil and gas pipeline	50	GT-B-2 would cross near I-10.	R 2341
Southern California Gas Company	Underground oil and gas pipeline	50	GT-B-2 would cross near I-10.	LA 0134693
Southern California Gas Company	Underground oil and gas pipeline	50	GT-B-2 would cross near I-10.	LA 0110795

Source: First Solar 2010

The Project is sited within a Solar Energy Study Area proposed to be designated under the Department of Energy and BLM Programmatic Solar Energy Development EIS. The site is also within a California Renewable Energy Zone identified by the Renewable Energy Transmission Initiative (First Solar 2009). The site is positioned in a priority interconnection location within the California Independent System Operator; it would interconnect to the existing 500-kV transmission line, SCE's DPV1 Line.

Minerals–Related Uses

There are no known salable mineral resources (e.g., sand and gravel) at the Project site. Although the Project site is not used to produce salable minerals, salable materials are present throughout the region.

The potential for the exploration and development of other mineral resources such as oil, gas, coal, sodium, potassium, and phosphate exists in the Project area and throughout the region.

3.10 NOISE

Noise is defined as unwanted or extraneous sound. Sound is caused by vibrations that generate waves of minute air pressure fluctuations. Air pressure fluctuations that occur from 20 to 20,000 times per second can be detected as audible sound. The number of pressure fluctuations per second is normally reported as cycles per second or Hertz (Hz). Different vibration frequencies produce different tonal qualities for the resulting sound. In general, sound waves travel away from the noise source as an expanding spherical surface. The energy contained in a sound wave is consequently spread over an increasing area as it travels away from the source. This results in a decrease in loudness at greater distances from the noise source.

Decibel Scales

Human hearing varies in sensitivity for different sound frequencies. The ear is most sensitive to sound frequencies between 800 and 8,000 Hz, less sensitive to higher and lower sound frequencies, and least sensitive to sound frequencies below 250 Hz. Peak sensitivity to pure tones typically occurs at frequencies between 2,000 Hz and 6,000 Hz. Relative sensitivity remains fairly high between about 250 Hz and 2,000 Hz. Relative sensitivity drops off slightly above 7,000 Hz, and drops off significantly below 200 Hz. In addition, relative sensitivity to different acoustic frequencies also varies with the intensity of the sound. Several different frequency weighting schemes have been developed, using different decibel (dB) adjustment values for each octave or 1/3 octave interval. Some of these weighting schemes are intended to approximate the way the human ear responds to noise levels; others are designed to account for the response of building materials to airborne vibrations and sound. The most commonly used decibel weighting schemes are the A-weighted and C-weighted scales.

The "A-weighted" decibel scale (dBA) is normally used to approximate human hearing response to sound. The A-weighted scale significantly reduces the measured pressure level for low frequency sounds while slightly increasing the measured pressure level for some middle frequency sounds. The "C-weighted" decibel scale (dBC) is often used to characterize low frequency sounds capable of inducing vibrations in buildings or other structures. The C-weighted scale makes only minor reductions to the measured pressure level for low frequency components of a sound while making slightly greater reductions to high frequency components than does the A-weighted scale.

Table 3.10-1 provides examples of typical dBA levels.

Table 3.10-1
Examples of Typical dBA Levels

Characterization	dBA	Example Noise Condition
Threshold of pain	130	Peak noise 50 feet behind firing position, M-16 and M-24 rifles.
	125	Mach 1.9 sonic boom under aircraft at 11,000 feet.
Possible building damage	120	Air raid siren at 50 feet. Mach 1.1 sonic boom under aircraft at 12,000 feet.
Threshold of immediate NIPTS[1]	115	Commercial fireworks (5 pound charge) at 1,500 feet.
	110	Peak noise 50 feet behind firing position, .22 caliber rifle. Peak crowd noise, pro football game, inside open stadium.
	105	Emergency vehicle siren at 50 feet. Conventional pile driver peak noise at 50 feet. Chain saw (2-stroke gasoline engine) at 3 feet.
	100	Jackhammer at 10 feet.

Table 3.10-1 (continued)
Examples of Typical dBA Levels

Characterization	dBA	Example Noise Condition
Extremely noisy	95	Locomotive horn at 100 feet. Large wood chipper processing tree branches at 30 feet.
8-hour OSHA[2] limit	90	Leaf blower at 5 feet. Jackhammer at 50 feet. Dog barking at 5 feet.
Very noisy	85	Gas engine lawnmower at 5 feet. Bulldozer, excavator, or paver at 50 feet. Pneumatic wrench at 50 feet.
	80	Fork lift or front end loader at 50 feet. Table saw at 25 feet. Vacuum cleaner at 5 feet.
Noisy	75	Idling locomotive at 50 feet. Street sweeper at 30 feet.
	70	Leaf blower at 50 feet. 300 feet from busy 6-lane freeway.
Moderately noisy	65	Typical daytime busy downtown background conditions. Typical gas engine lawn mower at 50 feet.
	60	Typical daytime urban mixed use area conditions. Normal human speech at 5 feet. Typical electric lawn mower at 50 feet.
	55	Typical urban residential area away from major streets. Low noise electric lawn mower at 65 feet.
	50	Typical suburban daytime background conditions. Open field, summer night with numerous crickets.
Quiet	45	Typical rural area daytime background conditions. Suburban back yard, summer night with several crickets.
	40	Typical suburban area at night. Typical whispering at 1 to 2 feet.
	35	Quiet suburban area at night. Quiet whispering at 1 to 2 feet.
Very quiet	30	Quiet rural area, winter night, no wind. Quiet bedroom at night, no air conditioner.
	20	Empty recording studio. Remote area, no audible wind, water, insects, or animal sounds.
Barely audible	10	Audiometric testing booth.
Threshold of hearing, no hearing loss	0	

Notes:

[1] NIPTS = noise-induced permanent threshold shift (permanent hearing damage)

[2] OSHA = Occupational Safety and Health Administration

Indicated noise levels are average dBA levels for stationary noise sources or peak noise levels for brief noise events and noise sources moving past a fixed reference point.

Average and peak dBA levels are not 24-hour CNEL (community noise exposure level) or Ldn (day-night noise level) values.

Decibel scales are not linear. Apparent loudness doubles with every 10 dBA increase, regardless of the initial dBA level.

Most adults have accumulated some hearing loss and have a threshold of hearing above 15 dBA. In occupational hearing conservation programs, a threshold of hearing between 20 and 30 dBA is considered normal.

Source: data compiled by Tetra Tech staff.

Common Noise Descriptors

Varying noise levels are often described in terms of the equivalent constant decibel level. Equivalent noise levels (Leq) are used to develop single-value descriptions of average noise exposure over various periods. Such average noise exposure ratings often include additional weighting factors for annoyance potential due to time of day or other considerations. The Leq data used for these average noise exposure descriptors are generally based on A-weighted sound level measurements, although other weighting systems are used for special conditions (such as blasting noise).

Average noise exposure over a 24-hour period is often presented as a day-night average sound level (Ldn) or a community noise equivalent level (CNEL). Ldn values are calculated from hourly Leq values, with the Leq values for the nighttime period (10:00 PM to 7:00 AM) increased by 10 dB to reflect the greater disturbance potential from nighttime noises. CNEL values are very similar to Ldn values, but include a 5 dB annoyance adjustment for evening (7:00 PM to 10:00 PM) Leq values in addition to the 10 dB adjustment for nighttime Leq values. Except in unusual situations, the CNEL descriptor will be within 1.5 dB of the Ldn descriptor for the same set of noise measurements. Unless specifically noted otherwise, Ldn and CNEL values are assumed to be based on dBA measurements.

Working with Decibel Values

The nature of dB scales is such that individual dB ratings for different noise sources cannot be added directly to give the dB rating of the combination of these sources. Two noise sources producing equal dB ratings at a given location will produce a composite noise level 3 dB greater than either sound alone. When two noise sources differ by 10 dB, the composite noise level will be only 0.4 dB greater than the louder source alone. Most people have difficulty distinguishing the louder of two noise sources that differ by less than 1.5 to 2 dB. In general, a 10 dB increase in noise level is perceived as a doubling in loudness. A 2 dB increase represents a 15 percent increase in loudness, a 3 dB increase is a 23 percent increase in loudness, and a 5 dB increase is a 41 percent increase in loudness.

When distance is the only factor considered, sound levels from an isolated noise source will typically decrease by about 6 dB for every doubling of distance away from the noise source. When the noise source is essentially a continuous line (e.g., vehicle traffic on a highway), noise levels decrease by about 3 dB for every doubling of distance.

3.10.1 Applicable Plans, Policies, and Regulations

Various federal, state, and local agencies have developed guidelines for evaluating land use compatibility under different noise level ranges. The federal Noise Control Act of 1972 (Public Law 92-574) established a requirement that all federal agencies must administer their programs in a manner that promotes an environment free from noise that jeopardizes public health or welfare. The US Environmental Protection Agency (EPA) was given the responsibility for: providing information to the public regarding identifiable effects of noise on public health or welfare, publishing information on the levels of environmental noise that will protect the public health and welfare with an adequate margin of safety, coordinating federal research and activities related to noise control, and establishing federal noise emission standards for selected products distributed in interstate commerce. The federal Noise Control Act also directed all federal agencies to comply with applicable federal, state, interstate, and local noise control regulations to the same extent that any person is subject to such requirements.

Although EPA was given major public information and federal agency coordination roles, each federal agency retains authority to adopt noise regulations pertaining to agency programs. EPA can require other federal agencies to justify their noise regulations in terms of the federal Noise Control Act policy requirements, but has no authority to approve or disapprove the noise regulations and policies of other federal agencies. The Occupational Safety and Health Administration has primary authority for setting workplace noise exposure standards. Due to aviation safety considerations, the Federal Aviation Administration has primary jurisdiction over aircraft noise standards.

Federal Criteria and Standards

In response to the requirements of the federal Noise Control Act, EPA (1974) has identified indoor and outdoor noise limits to protect public health and welfare (hearing damage, sleep disturbance, and communication disruption). Outdoor Ldn values of 55 dB and indoor Ldn values of 45 dB are identified as desirable to protect against speech interference and sleep disturbance for residential, educational, and health care areas. Noise level criteria to protect against hearing damage in commercial and industrial areas are identified as 24-hour Leq values of 70 dB (both outdoors and indoors).

In 1980 the Federal Interagency Committee on Urban Noise (FICUN) developed guidelines to evaluate whether existing and proposed land uses are compatible with prevailing noise levels (FICUN 1980). The primary federal agencies participating in the FICUN report included EPA, the Department of Defense, the Department of Housing and Urban Development (HUD), the Department of Transportation, and the Veterans Administration. The FICUN guidelines address land use compatibility and recommend building design considerations according to three noise level categories:

- Zone 1 = Ldn or CNEL levels below 65 dB;
- Zone 2 = Ldn or CNEL levels of 65 to 75 dB; and
- Zone 3 = Ldn or CNEL levels above 75 dB.

The FICUN guidelines indicate that all land uses are compatible with Zone 1 noise levels. Educational and residential land uses generally are not compatible with Zone 2 noise levels unless special acoustic treatments and designs are used to ensure acceptable interior noise levels. Residential and educational land uses are not compatible with Zone 3 noise levels. Industrial and manufacturing land uses may be acceptable in Zone 3 areas if special building designs and other measures are implemented.

The Federal Highway Administration (FHWA) has adopted criteria for evaluating noise impacts associated with federally funded highway projects and for determining whether these impacts are sufficient to justify funding noise mitigation actions (47 FR 131:29653-29656). FHWA noise abatement criteria are based on peak hour Leq noise levels, not Ldn or 24-hour Leq values. The peak 1-hour Leq criteria for residential, educational, and health care facilities are 67 dB outdoors and 52 dB indoors. The peak 1-hour Leq criterion for commercial and industrial areas is 72 dB (outdoors).

The relationship between peak hour Leq values and associated Ldn values depends on the distribution of traffic over the entire day. There is no precise way to convert a peak hour Leq value to an Ldn value. In urban areas with heavy traffic, the peak hour Leq value is typically 2 to 4 dB

lower than the daily Ldn value. In less heavily developed areas, the peak hour Leq is often equal to the daily Ldn value. For rural areas with little nighttime traffic, the peak hour Leq value will often be 3 to 4 dB greater than the daily Ldn value.

HUD has established guidelines for evaluating noise impacts on residential projects seeking financial support under various grant programs (44 FR 135:40860-40866). Sites are generally considered acceptable for residential use if they are exposed to outdoor Ldn values of 65 dB or less. Sites are considered "normally unacceptable" if they are exposed to outdoor Ldn values of 65 to 75 dB. Sites are considered unacceptable if they are exposed to outdoor Ldn values above 75 dB.

State Criteria and Standards

The California Governor's Office of Planning and Research (2003) has published guidelines for the noise element of local general plans. These guidelines include a noise level/land use compatibility chart that categorizes outdoor CNEL/Ldn levels into as many as four compatibility categories (normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable), depending on land use. For many land uses, the chart shows overlapping CNEL/Ldn ranges for two or more compatibility categories.

The noise element guidelines chart identifies the normally acceptable range for low density residential uses as CNEL/Ldn values less than 60 dB, while the conditionally acceptable range is 55 to 70 dB. The normally acceptable range for high density residential uses is identified as CNEL/Ldn values below 65 dB, while the conditionally acceptable range is identified as 60 to 70 dB. For educational and medical facilities, CNEL/Ldn values below 70 dB are considered normally acceptable, while values of 60 to 70 dB are considered conditionally acceptable. For office and commercial land uses, CNEL/Ldn values below 70 dB are considered normally acceptable, while values of 67.5 to 77.5 dB are categorized as conditionally acceptable. The overlapping CNEL/Ldn ranges are intended to indicate that local conditions (existing noise levels and community attitudes toward dominant noise sources) should be considered in evaluating land use compatibility at specific locations.

Local Criteria and Standards

Cities and counties in California are required to adopt a noise element as part of their general plans. Many cities and counties have incorporated the California Department of Health Services land use compatibility guidelines as a key item in the general plan noise element, while other cities and counties have developed their own land use compatibility guidelines. In addition to local general plan noise elements, some cities and counties have adopted noise ordinances to legally define noise nuisances. Local noise ordinances vary considerably in their format and coverage. Many noise ordinances establish property line performance standards for different land use or zoning categories. There is considerable variation among communities as to the types of noise sources covered under local noise ordinances.

The noise element of the Riverside County General Plan (Riverside County 2003) identifies noise-sensitive land uses to include:

- Residential uses,
- Schools,
- Hospitals,

- Rest homes,
- Long-term care facilities,
- Mental care facilities,
- Libraries,
- Places of worship, and
- Passive recreation uses.

Riverside County has adopted the land use compatibility criteria summarized in Table 3.10-2 as part of the noise element of the County General Plan.

Table 3.10-2
Riverside County Land Use Compatibility Standards

Land Use	CNEL or Ldn Noise Level			
	Normally Acceptable	**Conditionally Acceptable**	**Normally Unacceptable**	**Clearly Unacceptable**
Low density residential (single family, duplex, mobile homes)	Up to 60 dBA	55 – 70 dBA	70 – 75 dBA	Over 75 dBA
Multiple-family residential	Up to 65 dBA	60 – 70 dBA	70 – 75 dBA	Over 75 dBA
Transient lodgings (motels and hotels)	Up to 65 dBA	60 – 70 dBA	70 – 80 dBA	Over 80 dBA
Schools, libraries, churches, hospitals, nursing homes	Up to 70 dBA	60 – 70 dBA	70 – 80 dBA	Over 80 dBA
Auditoriums, concert halls, amphitheaters	Category not used	Up to 70 dBA	Over 65 dBA	Category not used
Sports arenas, outdoor spectator sports	Category not used	Up to 75 dBA	Over 70 dBA	Category not used
Playgrounds, neighborhood parks	Up to 70 dBA	Category not used	67.5 – 75 dBA	Over 72.5 dBA
Golf courses, riding stables, water recreation, cemeteries	Up to 75 dBA	Category not used	70 – 80 dBA	Over 80 dBA
Office buildings, business commercial, professional	Up to 70 dBA	67.5 – 77.5 dBA	Category not used	Over 75 dBA
Industrial, manufacturing, utilities, agriculture	Up to 75 dBA	70 – 80 dBA	Category not used	Over 75 dBA

Source: Riverside County 2003

The noise element of the County General Plan includes numerous policies intended to minimize noise-related conflicts between adjacent types of land uses. These policies include the following:

- Discourage noise-sensitive land uses from being located in areas exposed to CNEL levels above 65 dBA;

- Guide noise-tolerant land uses into areas committed to land uses that are noise-producing, such as transportation corridors or areas adjacent to airports;
- Minimize noise spillover or encroachment from commercial and industrial land uses into adjoining residential neighborhoods or noise-sensitive areas;
- Discourage projects that cannot successfully mitigate excessive noise;
- Require commercial or industrial truck delivery hours to be limited when next to noise-sensitive land uses unless there is no feasible alternative or there are overriding transportation benefits;
- New land use development within Airport Influence Areas should comply with airport land use noise compatibility criteria contained in the applicable airport land use compatibility plan;
- Require development that generates increased traffic and subsequent increases in ambient noise level adjacent to noise-sensitive land uses to provide for appropriate mitigation measures;
- Ensure that construction activities are regulated to establish hours of operation in order to prevent or mitigate the generation of excessive or adverse noise impacts on surrounding areas;
- Require that all construction equipment utilize noise reduction features (such as mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer; and
- Consider the issue of adjacent residential land uses when designing and configuring all new non-residential development. Design and configure on-site ingress and egress points to divert traffic away from nearby noise-sensitive land uses to the greatest degree practicable.

The noise element of the County General Plan also identifies preferred noise standards for stationary noise sources that affect residential land uses (Table 3.10-3).

Table 3.10-3
Stationary Source Noise Standards

Land Use	Time of Day	Interior Noise Standard	Exterior Noise Standard
Residential	7:00 AM to 10:00 PM	55 dBA, 10-minute Leq	65 dBA, 10-minute Leq
	10:00 PM to 7:00 AM	40 dBA, 10-minute Leq	45 dBA, 10-minute Leq

Note: The Riverside County Planning Department and Riverside County Office of Public Health have administrative discretion regarding application of these standards.
Source: Riverside County 2003.

Riverside County has adopted a noise ordinance (Ordinance 847) to regulate noise sources on one property that may impact adjacent properties. The noise ordinance sets general noise standards according to the land use designation of the affected property. Table 3.10-4 summarizes the basic noise standards in Riverside County Ordinance 847.

Table 3.10-4
Noise Limits in the Riverside County Noise Ordinance

Impacted Land Use	General Plan Designations	Noise Standard, 7 AM to 10 PM	Noise Standard, 10 PM to 7 AM
Rural Residential	RR, RM, RD	45 dBA	45 dBA
Community Residential	EDR, VLDR, LDR, MDR, MHDR, HDR, VHDR, HTDR, SP	55 dBA	45 dBA
Commercial and Office	CR, CO, CT, CC, SP	65 dBA	55 dBA
Business Park	BP	65 dBA	45 dBA
Light Industrial	LI, SP	75 dBA	55 dBA
Heavy Industrial	HI, SP	75 dBA	75 dBA
Public Facility	PF	65 dBA	45 dBA
Agriculture	AG	45 dBA	45 dBA
Open Space	C, CH, REC, RUR, W	45 dBA	45 dBA
Mineral Resources	MR	75 dBA	45 dBA

Source: Riverside County Ordinance 847

The Riverside County noise ordinance also includes special provisions related to sound amplification systems, live music, audio equipment, and power tools. The noise ordinance also provides for exceptions from the general and special noise standard provisions. In addition, the following facilities and activities are exempt from the provisions of the noise ordinance:

- Facilities owned or operated by government agencies;
- Capital improvement projects of government agencies;
- Maintenance and repair of public properties;
- Public safety personnel and their equipment in the course of conducting their official duties;
- Agricultural operations conducted on lands designated agricultural in the General Plan or on lands zoned A-1, A-2, A-P, A-D, or C/V provided those operations are carried out in a manner consistent with accepted industry standards;
- Wind energy conservation systems provided that they comply with Riverside County Ordinance 348;
- Private construction projects located a quarter mile or more from the nearest inhabited dwelling;
- Private construction projects located within a quarter mile of an inhabited dwelling provided that construction activities are limited to 6:00 AM to 6:00 PM during the months of June through September and are limited to 7:00 AM to 6:00 PM during the months of October through May;
- Property maintenance, including the use of mowers, leaf blowers, etc. provided that such activity is limited to the hours of 7:00 AM to 8:00 PM;
- Motor vehicles other than off-highway vehicles, but this exemption does not apply to motor vehicle sound systems; and
- The discharge of firearms in compliance with all state laws.

Vibration

Ground-borne vibrations can be a source of annoyance to people or a source of structural damage to some types of buildings. Although vibration measurements can be presented in many different forms, peak particle velocity (PPV) is the unit of measure used most often to assess building damage potential. The California Department of Transportation (Caltrans) has identified vibration impact criteria for both building damage potential and human annoyance (Caltrans 2002, 2004). Both human annoyance effects and building damage effects depend in part on whether vibration events are isolated, discrete events or a relatively continuous episode of vibrations. In general, there is less sensitivity to single, discrete events than to continuous events or frequently repeated discrete events. Table 3.10-5 summarizes Caltrans criteria for assessing the effects of ground-borne vibration.

Table 3.10-5
Summary of Caltrans Vibration Criteria

		Peak Particle Velocity, inches/second	
Type of Criteria	**Threshold Condition**	**Transient Sources**	**Continuous or Frequent Sources**
Human Response	Barely perceptible	0.04	0.01
	Distinctly perceptible	0.25	0.04
	Strongly perceptible; may be annoying to some people in buildings	0.9	0.10
	Severe; unpleasant for people in buildings; unacceptable to pedestrians on bridges	2.0	0.4
Building Damage	Cosmetic damage threshold for extremely fragile historic buildings, ruins, and ancient monuments	0.12	0.08
	Cosmetic damage threshold for fragile buildings	0.2	0.1
	Cosmetic damage threshold for historic and some old buildings	0.5	0.25
	Cosmetic damage threshold for older residential structures	0.5	0.3
	Cosmetic damage threshold for newer residential structures	1.0	0.5
	Cosmetic damage threshold for modern industrial/ commercial buildings	2.0	0.5

Source: Caltrans 2002, 2004

The noise element of the Riverside County General Plan includes consideration of ground-borne vibrations. The following land uses are identified by the noise element as being vibration sensitive:

- Hospitals,
- Residential areas,
- Concert halls,
- Libraries,
- Sensitive research operations,
- Schools, and
- Offices.

Riverside County General Plan policies related to vibration include the following:

- Restrict the placement of sensitive land uses in proximity to vibration-producing land uses, and
- Prohibit the exposure of residential dwellings to ground vibration from passing trains that would be perceptible on the ground or second floors (vibrations are presumed to be perceptible if they exceed a peak particle velocity of 0.01 inch per second over a range of 1 to 100 Hz).

3.10.2 Existing Conditions

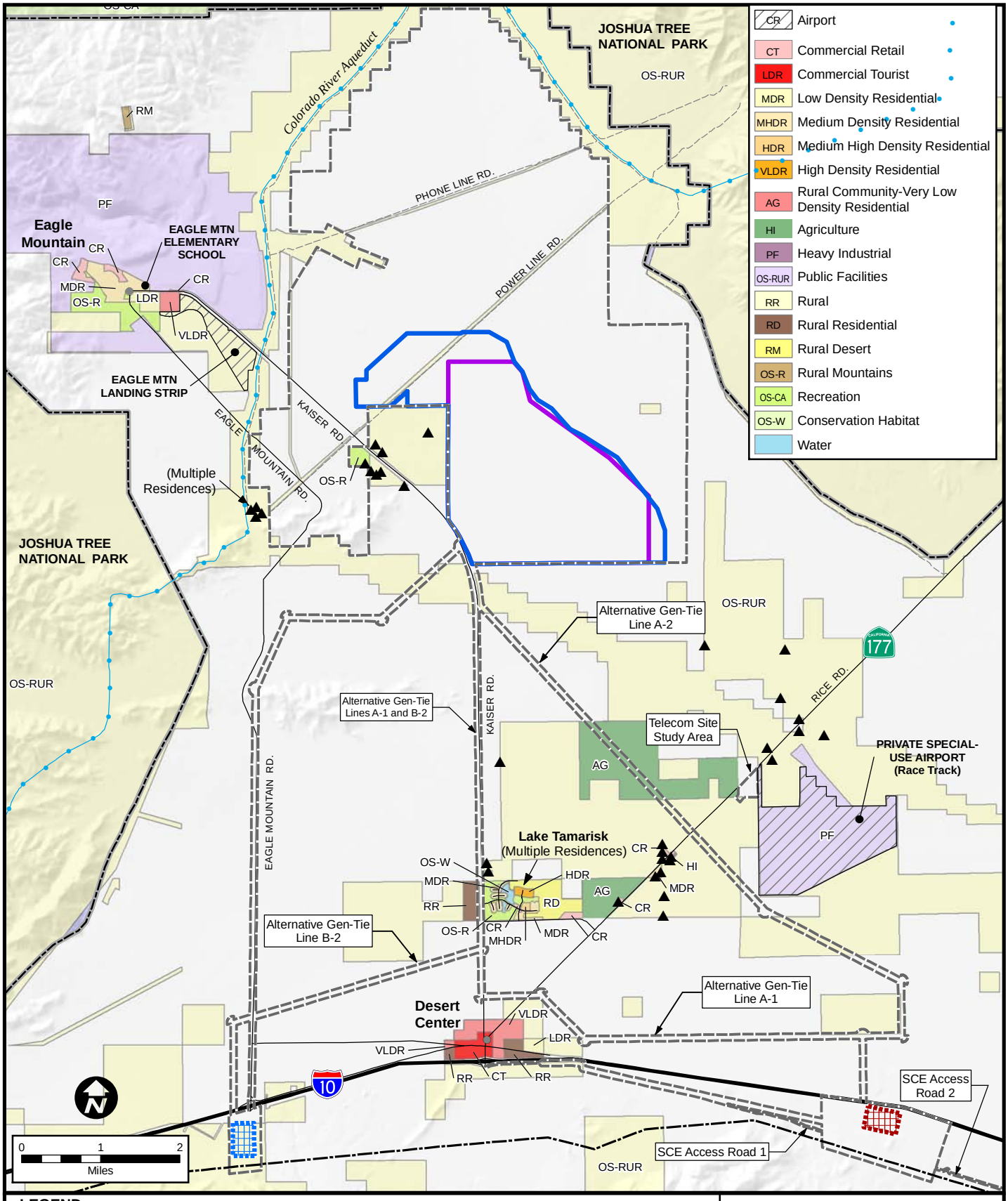
Noise

Existing noise sources near the Solar Farm site, Gen-Tie Line corridors, and alternative Substation sites include local roadway traffic, off-highway recreational vehicle use, agricultural operations, aircraft overflights, private landing strips, traffic on I-10, and aerodynamic noise from wind blowing through vegetation or around structures. Ambient noise levels have not been measured in the vicinity of the proposed Solar Farm, Gen-Tie Line corridors, or at the alternative Substation locations. However, based on general land use conditions *and the remote nature of the Project locations*, existing background noise levels would be expected to vary from 35 to 50 dBA during the daytime, and to drop to 25 to 35 dBA at night. Somewhat higher noise levels would occur in proximity to I-10. At distances of more than a few hundred feet from I-10, existing CNEL levels would probably be about 45 dBA.

Locations of noise-sensitive land uses in the Project vicinity include homes along Kaiser Road near the Solar Farm site, homes between the south end of the Solar Farm site and SR-177, homes in Eagle Mountain Village (three occupied by caretakers, the rest vacant), Eagle Mountain Elementary School at Eagle Mountain Village, the Tamarisk Lake development, and homes in Desert Center. *The closest residence is about 1,175 feet from the property line of the proposed Solar Farm site. All other nearby homes are 2,640 feet or farther from the proposed Solar Farm property line. In addition, Joshua Tree National Park is located as close as 1.4 miles from the southeast boundary of the Project site.* Figure 3.10-1 illustrates the locations of noise-sensitive land uses.

Vibration

There are no identifiable sources of significant ground-borne vibrations in the Project vicinity. Traffic on I-10 will produce low levels of vibration, but those vibrations would dissipate very rapidly to imperceptible levels at the Project locations. All of the noise-sensitive *land uses* discussed above would also be considered vibration-sensitive.


X:\GIS\Desert_Sunlight\MXD_Files\Land Use_Residence.mxd
JOSHUA TREE NATIONAL PARK
OS-RUR
Colorado River Aqueduct
RM
PF
Eagle Mountain
EAGLE MTN ELEMENTARY SCHOOL
CR
MDR
OS-R
LDR
VLDR
EAGLE MTN LANDING STRIP
PHONE LINE RD.
POWER LINE RD.
KAISER RD.
EAGLE MOUNTAIN RD.
(Multiple Residences)
JOSHUA TREE NATIONAL PARK
OS-RUR
Alternative Gen-Tie Line A-2
Alternative Gen-Tie Lines A-1 and B-2
KAISER RD.
EAGLE MOUNTAIN RD.
Telecom Site Study Area
AG
RICE RD.
177
PRIVATE SPECIAL-USE AIRPORT (Race Track)
PF
Lake Tamarisk
(Multiple Residences)
OS-W
MDR
RR
OS-R
HDR
RD
AG
HI
MHDR
Alternative Gen-Tie Line B-2
Alternative Gen-Tie Line A-1
Desert Center
VLDR
LDR
RR
CT
10
SCE Access Road 2
SCE Access Road 1
OS-RUR
0
1
2
Miles
Airport
Commercial Retail
Commercial Tourist
Low Density Residential
Medium Density Residential
Medium High Density Residential
High Density Residential
Rural Community-Very Low Density Residential
Agriculture
Heavy Industrial
Public Facilities
Rural
Rural Residential
Rural Desert
Rural Mountains
Recreation
Conservation Habitat
Water
LEGEND
Rural Residence
Devers-Palo Verde Transmission Line (DPV1)
Desert Sunlight Study Area Boundary
Solar Farm Boundary (Alternative B)
Solar Farm Boundary (Alternative C)
Red Bluff Substation (Alternative A)
Red Bluff Substation (Alternative B)
BLM Land
Source: Riverside County Integrated Plan, 2003.
DESERT SUNLIGHT SOLAR FARM
Figure 3.10-1
Residences and Residential Areas in the Vicinity of the Project Area

3.11 PUBLIC HEALTH AND SAFETY/HAZARDOUS MATERIALS

This section describes the *existing* environmental and regulatory settings associated with the construction and operation of the proposed Project or its alternatives with respect to hazards, health and safety that may be present in the Project Study Area.

3.11.1 Applicable Plans, Policies, and Regulations

The following section provides a summary of the federal, state, and local regulatory framework and the laws, regulations and standards that govern hazards, health and safety in the Project area.

Federal

Hazardous Materials Transportation Act (49 USC § 5101 et seq.)

The US Department of Transportation has regulatory authority for the safe transportation of hazardous materials under the Hazardous Materials Transportation Act, as amended and codified in 49 United States Code (USC) 5101 et seq. Vehicles transporting hazardous materials must comply with strict containment, safety, labeling and manifesting requirements.

Resource Conservation and Recovery Act (42 USC. § 6901 et seq.)

The Resource Conservation and Recovery Act (RCRA) of 1976 establishes a program administered by the US Environmental Protection Agency (USEPA) for the regulation of the generation, transportation, treatment, storage and disposal of hazardous waste. RCRA was amended in 1984 by the Hazardous and Solid Waste Act (HSWA), which affirmed and extended the "cradle to grave" system of regulating hazardous waste. The use of certain techniques for the disposal of some hazardous wastes was specifically prohibited by HSWA. RCRA regulates hazardous waste from the time that the waste is generated, through to its management, storage, transport, and treatment until its final disposal. In California, the EPA has authorized the Department of Toxic Substance Control (DTSC) to administer the RCRA program, pursuant to the State's Hazardous Waste Control Law (HWCL).

Comprehensive Environmental Response, Compensation, and Liability Act (Superfund) of 1980 (42 USC. § 9601 et seq.)

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) provides a federal Superfund to clean up uncontrolled or abandoned hazardous waste sites as well as accidents, spills and other emergency releases of pollutants and contaminants into the environment. The EPA generally administers CERCLA. This law provides broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment.

Superfund Amendments and Reauthorization Act of 1986 (Title III 40 CFR§ 68.110 et seq.)

The Superfund Amendments and Reauthorization Act (SARA) amended CERCLA and established a nationwide emergency planning and response program, and imposed reporting requirements for businesses that store, handle or produce significant quantities of extremely hazardous materials. Administered by the EPA, the act requires states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such materials is stored or handled at a

facility. Additionally, SARA identifies requirements for planning, reporting, and notification concerning hazardous materials.

Clean Water Act (33 USC. §1251 et seq.)

The Clean Water Act (CWA) is the principal federal statute protecting navigable waters of the United States and adjoining shorelines from the discharge of pollution from point sources. Since its enactment, the CWA has formed the foundation for the regulations and permitting of pollution prevention and response measures in waters subject to federal jurisdiction. The CWA establishes basic structure for regulating discharges of pollutants into the waters of the United States; establishes pollution control programs such as setting wastewater standards for industry; and sets water quality standards for all contaminants in surface waters.

Oil Pollution Prevention (40 CFR Part 112)

The goal of the oil pollution prevention regulation in 40 Code of Federal Regulations (CFR) Part 112 is to prevent oil discharges from reaching navigable waters of the United States or adjoining shorelines. Facilities that could reasonably be expected to discharge oil into navigable waters in quantities that may be harmful are required to develop and implement Spill Prevention, Control and Countermeasures (SPCC) plans per the SPCC rule.

Occupational Safety and Health Administration

The Occupational Safety and Health Administration (OSHA) administers health standards that (1) provide regulations for safety in the workplace; (2) regulate construction safety; and (3) require a Hazards Communication Plan. The plan includes identification and inventory of all hazardous materials for which Material Safety Data Sheets (MSDS) would be maintained, and employee training in safe handling of said materials.

State of California

California Environmental Protection Agency

The California Environmental Protection Agency (Cal EPA) unifies California's environmental authority, consolidating the California Air Resources Board (CARB), State Water Resources Control Board (SWRCB), Regional Water Quality Control Board (RWQCB), Integrated Waste Management Board (IWMB), the DTSC, Office of Environmental Health Hazard Assessment (OEHHA), and the Department of Pesticide Regulation (DPR) under one agency. The California Hazardous Waste Control Law is administered by Cal EPA's DTSC.

Department of Toxic Substance Control

The DTSC is the primary agency in California that regulates hazardous waste, administers clean-ups of existing contamination and looks for ways to reduce hazardous waste produced in California. The DTSC regulates hazardous waste in California primarily under the authority of RCRA and the California Health and Safety Code. The DTSC manages, maintains and monitors the Cortese list of hazardous waste sites. The Cortese list, or Hazardous Waste and Substances Sites List, is a planning resource used by the state, local agencies, and developers to comply with CEQA requirements in providing information about the location of hazardous materials release sites.

California Emergency Management Agency

The California Emergency Management Agency (Cal/EMA) was formed January 1, 2009 as a result of a merger between the Governor's Office of Emergency Services (OES) and the Office of Homeland Security. The Hazardous Materials Unit of the Cal/EMA is responsible for HAZMAT emergency planning and response, spill release notifications, and HAZMAT enforcement of the Unified Program. The OES provides emergency response services in support of local jurisdictions.

California Public Utilities Commission

The Applicant and SCE would use the CPUC General Order 95 and 165, as related to fire-safe design and maintenance practices for transmission lines, to establish minimum requirements for the Project regarding inspection (including maximum allowable inspection cycle lengths), condition rating, scheduling and performance of corrective action, record keeping and reporting, in order to ensure a safe and high-quality electrical service.

Riverside County

County of Riverside Department of Environmental Health

The County of Riverside Department of Environmental Health (DEH) acts as the Certified Unified Program Agency (CUPA) for Riverside County and is responsible for reviewing Hazardous Materials Business Plans. A CUPA is a local agency that has been certified by Cal EPA to implement state environmental programs related to hazardous materials and waste. The DEH is responsible for protecting the health and safety of the public and the environment of Riverside County by assuring that hazardous materials are properly handled and stored. The DEH accomplishes this through inspection, emergency response, site remediation and hazardous waste management services. The specific responsibilities of the DEH include the following:

- Inspecting hazardous material handlers and hazardous waste generators to ensure full compliance with laws and regulations.
- Implementing CUPA programs for the development of accident prevention and emergency plans, proper installation, monitoring, and closure of underground storage tanks and the handling, storage and transportation and disposal of hazardous wastes.
- Providing 24-hour response to emergency incidents involving hazardous materials or wastes in order to protect the public and the environment from accidental releases and illegal activities.
- Overseeing the investigation and remediation of environmental contamination due to releases from underground storage tanks, hazardous waste containers, chemical processes or the transportation of hazardous materials.
- Conducting investigations and taking enforcement action as necessary against anyone who disposes of hazardous waste illegally or otherwise manages hazardous materials or wastes in violation of federal, state or local laws and regulations.

County of Riverside Fire Department

The County of Riverside Fire Department enforces county fire code standards, as detailed in Ordinance 787.2. Project proponents within Riverside County are required to complete a project-

specific fire prevention plan that encompasses fire risk management during construction, operation, and decommissioning.

3.11.2 Existing Conditions

This section contains a description of the environmental setting for the proposed Project and alternatives with respect to hazardous materials/waste and public health and safety issues that may exist in the proposed Project area. The following issues are addressed: past hazardous materials/hazardous waste use in the area, proximity to airports and schools, emergency evacuation routes, emergency response plans, wildfire, intentionally destructive acts, and electromagnetic fields (EMF).

The Project is proposed in an area that has a variety of uses including open space recreation and preserve, residential housing, and commercial businesses. There are no hazardous materials or hazardous waste generators in the proposed Project or alternatives areas.

Hazardous Materials/Waste

Existing and past land use activities are potential indicators of hazardous materials and hazardous waste storage and use. The primary reasons to define potentially hazardous sites are to protect the health and safety of construction and operations personnel and to minimize public exposure to hazardous materials during construction and waste handling.

The following is a summary definition of hazardous materials and hazardous waste.

- **Hazardous Material**: Any material that due to its quantity, concentration or physical characteristics poses a significant present or potential hazard to human health and safety or to the environment if released into the work place or environment.
- **Hazardous Waste**: A waste or combination of wastes, which due to its quantity, concentration or physical, chemical, or infectious characteristics, may cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating but reversible illness; or pose a substantial present or potential hazard to human health or the environment due to factors including, but not limited to carcinogenicity, acute toxicity, chronic toxicity, bioaccumulative properties or persistence in the environment when improperly treated, stored, transported, or disposed of or otherwise managed.

Database Review

A Phase I Environmental Site Assessment (ESA) was prepared for the Project area (including all Project components). As part of the Phase I ESA, a review of relevant hazardous waste/materials databases was completed by Environmental FirstSearch (2010) and resulted in the identification of a number of sites with potentially hazardous waste or materials. None of the sites were identified in the Phase I ESA as Recognizable Environmental Concerns (RECs) for the Project (AECOM Environment 2010). However, the Phase I preparers noted one non-REC issue that may require additional assessment: One small portion of the Project area (the telecom site) was formerly part of a military reservation and should be assessed to determine the presence of unexploded ordnance, if that particular area would be used as part of the Project. (These types of materials are referred to as munitions and explosives of concern, or MEC.) Unexploded ordnance may be a subset of these types of materials.

According to the Phase I ESA, seven entries were recorded on the Emergency Response Notification Systems (ERNS) list for spills within proximity to the proposed Project and its alternatives. These spills were identified along I-10. None of these spills were identified as needing additional work past initial cleanup activities. Therefore, none of the sites were deemed of potential concern to the Project or its alternatives.

Two additional sites were identified as permitted facilities. A sanitary landfill, listed as the Desert Center Sanitary site (17-991 Kaiser Road), was listed as a permitted Solid Waste Landfill (SWL) site that is permitted to accept agricultural, construction/demolition and mixed municipal waste by the County of Riverside Waste Management Department. The second permitted site is the Iron Mountain pumping station (6001 Iron Mountain Pumping Plant Road), which is also listed as a RCRA waste generator. An underground storage tank (UST) has also been associated with the Eagle Mountain pumping station. No violations or environmental actions for these sites were listed.

One additional site, the Eagle Mountain Mine, was listed as a No Further Remedial Action Planned (NFRAP). No violations or environmental actions for this site were listed.

A number of listings in the area were listed as registered USTs. No violations or environmental actions for these sites were identified. Two sites, also identified as UST sites, were listed on the Leaking Underground Storage Tank (LUST) list. The Caltrans Desert Center site (44740 Ragsdale Road) and the Metropolitan Water District Eagle Mountain Pumping Station (Eagle Mountain Road) were both listed as site closures with a no further action letter. No additional environmental actions were identified for either site.

Other Hazardous Waste Issues

Both the Phase I study and the Class I cultural inventory of the Project area indicated that the area was historically used as a military training facility and that there is potential for MEC to be present. During the Class III cultural resources survey, evidence of possible MEC was identified along two of the Gen-Tie Line alternatives.

Airports

Aboveground transmission lines associated with the Gen-Tie Line and the tower associated with the telecom site may pose a threat to aviation safety if they are located with an airport land use plan or flight zone. The former Desert Center Airport is located approximately four miles east, southeast from the proposed Solar Farm and less than a mile from the Gen-Tie Line A-2 transmission alternative. The 185-foot tower associated with the telecom site that is part of the Red Bluff Substation would be just *over* one mile (5,500 feet) from the private special-use airport's runway. This airport is no longer in regular use but has been developed into a multi-use recreational facility, including an automotive race track facility with accessory buildings, dry (without utility hook-ups) on-site camping and associated amenities. The redevelopment includes use of the runway as a private special-use airport (County of Riverside Redevelopment Agency 2009). There is also a private landing strip associated with the closed Eagle Mountain mine that is approximately two miles northwest of the proposed Solar Farm site. This private airstrip is minimally used to access the closed Eagle Mountain mine.

Schools

There is one school in the vicinity of the proposed Project. Eagle Mountain Elementary School is located approximately 2.5 miles from the Solar Farm site at 1434 Kaiser Road. It supports kindergarten through eighth grade students. Eagle Mountain Elementary School is part of the Desert Center Unified School District.

Emergency Evacuation Routes

Emergency evacuation routes in the Desert Center region are I-10 and SR-177 (Rice Road). Further discussion of transportation routes is provided in Section 3.15.

Emergency Response Plan

The County of Riverside DEH acts as the CUPA for Riverside County. The CUPA program is designed to consolidate, coordinate, and administer permits, inspection activities, and enforcement activities throughout the County of Riverside. The programs administered by the CUPA are as follows:

- Business Emergency Plan/Hazardous Materials Handler;
- Hazardous Waste Generators;
- Underground Storage Tanks;
- California Accidental Release Program (CalARP);
- Aboveground Petroleum Storage Act (APSA)/SPCC Plan; and
- Uniform Fire Code Hazardous Materials Management Plans.

The Applicant and SCE will be required to complete emergency response plans as identified by the DEH as relevant to the construction and operation of the proposed Project.

Wildfire/Fire

Wildfires consist of uncontrolled fire spreading through vegetation. Wildfires are caused by arson, campfires, improper burning of debris, accidental ignition caused by the use of gas-powered tools or vehicles, other man-made causes, and lightning. Wildfire behavior may vary due to individual fire characteristics, topography, fuels (i.e., type and quantity of available flammable material, referred to as fuel load), and weather conditions. The proposed Project and alternatives would be in open desert, characterized by sparse vegetation and minimal development. The Project Study Area in Riverside County has been determined to have a low to moderate susceptibility to wildfire (County of Riverside 2003).

Intentionally Destructive Acts

In light of two decisions by the US Court of Appeals for the Ninth Circuit, Department of Energy NEPA documents explicitly address the potential environmental consequences of intentionally destructive acts (i.e., acts of sabotage or terrorism) (US Department of Energy 2006). Each NEPA analysis of project and alternative impacts should explicitly consider intentionally destructive acts. As with any US energy infrastructure, the proposed Project or alternatives could be the target of terrorist attacks or sabotage.

Electromagnetic Fields

The information presented here is for informational purposes only, as requested by the CPUC. The source of information regarding EMF originated from the DPV2 EIR/EIS (California Public Utilities Commission and BLM 2006). There is no information available regarding existing EMF in the Project area, nor is there a requirement under NEPA or CEQA to address this issue.

Background – CPUC Guidelines

On January 15, 1991, the CPUC initiated an investigation to consider its role in mitigating the health effects, if any, of EMF from utility facilities and power lines. A working group of interested parties, called the California Electromagnetic Frequency Consensus Group, was created by the CPUC to advise it on this issue. The group consisted of stakeholders representing citizens groups, consumer groups, environmental groups, stakeholder agencies, unions and utilities. Based on the work of the Consensus Group, written testimony and evidentiary hearings, the CPUC issued its decision (93-11-013) on November 2, 1993, to address public concerns about possible EMF health effects from electric utility facilities.

In response to a situation of scientific uncertainty and public concerns, the decision specifically required utilities to consider "no-cost" and "low-cost" measures, where feasible, to reduce exposure from new or upgraded utility facilities requiring certification under General Order 131-D. It directs that no-cost mitigation measures be undertaken, and that low-cost options, when they meet certain guidelines for field reduction and cost, are adopted through the project certification process. The decision directed the utilities to use a 4 percent benchmark on the low-cost mitigation. These reduction measures would be documented in a project-specific Field Management Plan. The CPUC did not adopt any specific numerical limits or regulations on EMF levels related to electric power facilities.

In Decision D.93-11-013, the CPUC addressed mitigation of EMF of utility facilities and implemented the following recommendations:

- No-cost and low-cost steps to reduce EMF levels;
- Workshops to develop EMF design guidelines;
- Uniform residential and workplace programs;
- Stakeholder and public involvement;
- A four-year education program;
- A four-year nonexperimental and administrative research program; and
- An authorization of federal experimental research conducted under the National Energy Policy Act of 1992.

Most recently the CPUC issued Decision D.06-01-042, on January 26, 2006, affirming the low-cost/no-cost policy to mitigate EMF frequency exposure from new utility transmission and substation projects. This decision also adopted rules and policies to improve utility design guidelines for reducing EMF. The CPUC stated: "At this time we are unable to determine whether there is a significant scientifically verifiable relationship between EMF exposure and negative health consequences."

The CPUC has not implemented a general requirement that utilities include nonroutine mitigation measures or other mitigation measures that are based on numeric values of EMF exposure and has not adopted any specific limits or regulation on EMF related to electric power facilities. Mitigation measures may be determined on a project-by-project basis by the CPUC.

Electromagnetic Fields

EMF is a term used to describe electric and magnetic fields that are created by electric voltage (electric field) and electric current (magnetic field). Electromagnetic fields can be viewed as a combination of both an electric and magnetic field that can be regarded as a smooth, continuous field, propagating in a wavelike manner. Power frequency EMF is a natural consequence of electrical currents, and can be either directly measured using the appropriate measuring instruments or calculated using appropriate information.

Electric fields are present whenever voltage exists on a wire, and are not dependent on current. The magnitude of the electric field is primarily a function of the configuration and operation voltage of the line and decreases with the distance from the source. The electric field can be shielded (i.e., the strength can be reduced) by any conducting surface, such as trees, fences, walls, buildings, and most types of structures. The strength of an electric field is measured in volts per meter (V/m) or kilovolts per meter (kV/m). Typical electric field values for appliances are presented in Table 3.11-1.

Table 3.11-1
Typical Electric Field Values for Appliances, at 12 Inches

Appliance	Electric Field Strength (kV/m)
Electric Blanket	0.25*
Broiler	0.13
Stereo	0.09
Refrigerator	0.06
Iron	0.06
Hand Mixer	0.05
Coffee Pot	0.03

*1 to 10 kV/m next to blanket wires.
kV/m: Kilovolts/meter
Source: Enertech Consultants 1985

Magnetic fields are present whenever current flows in a conductor, and are not dependent on voltage of the conductor. The strength of these fields also decreases with distance from the source. However, unlike electric fields, most common materials have little shielding effect on magnetic fields.

The magnetic field strength is a function of both the current on the conductor and the design of the system. Magnetic fields are measured in units called Gauss. However, for low levels normally encountered near electric utility facilities, the field strength is expressed in a much smaller unit, the milliGauss (mG), which is one thousandth of a Gauss.

Power frequency EMF is present whenever electricity is used. This includes not only electric power generation, utility transmission lines, distribution lines and on-site and off-site substations as proposed with this Project, but also the building wiring in homes, offices, schools and in the

appliances and machinery used in these locations. Magnetic field intensities from these sources can range from below 1 mG to above 1,000 mG (1 Gauss).

Research on ambient magnetic fields in homes and buildings in several western states found average magnetic field levels within most rooms to be approximately 1 mG. In a room with appliances present, the measured values ranged from 9 to 20 mG (Severson et al., 1988 and Silva et al., 1988). Immediately adjacent to appliances (within 12 inches), field values are much higher as illustrated in Table 3.11-2.

Table 3.11-2
Magnetic Field from Household Appliances

	Magnetic Field (mG)	
Appliance	**12-inch Distance**	**Maximum mG**
Electric range	3-20	100-2,000
Electric oven	2-25	10-50
Garbage disposal	10-20	850-1,250
Refrigerator	0.3-3	4-15
Clothes washer	2-30	10-400
Clothes dryer	1-3	3-80
Coffee maker	0.8-1	15-250
Toaster	0.6-8	70-150
Crock pot	0.8-1	15-80
Iron	1-3	90-300
Can opener	35-250	10,000-20,000
Mixer	6-100	500-7,000
Blender, popper, processor	6-20	500-7,000
vacuum cleaner	20-200	2,000-8,000
Portable heater	1-40	100-1,100
Fan/blower	0.4-40	20-300
Hair dryer	1-70	60-20,000
Electric shaver	1-100	150-500
Color television	9-20	150-500
Fluorescent fixture	2-40	140-2,000
Fluorescent desk lamp	6-20	400-3,500
Circular saw	10-250	2,000-10,000
Electric drill	25-35	4,000-8,000

Source: Gauger 1985

Magnetic field strength diminishes with distance. Fields from compact sources (i.e., those containing coils such as small appliances and transformers) drop off with distance (r) from the source by a factor of $1/r^3$. For three-phase power lines with balanced currents, the magnetic field strength drops off at a rate of $1/r^2$. Fields from unbalanced currents, which flow in paths such as neutral or ground conductors, fall off inversely proportional to the distance from the source or $1/r$. Conductor spacing and configuration also affect the rate at which the magnetic field strength decreases, as well as the presence of other sources of electricity.

EMF levels can be reduced in three primary ways: shielding, field cancellation or increasing the distance from the source. Shielding, which primarily reduces exposure to electric fields, can be actively accomplished by placing trees or other physical barriers adjacent to the EMF generating

structure. Since electric fields can be blocked by most materials, shielding is effective for the electric fields but of limited effectiveness for magnetic fields.

Magnetic fields can be reduced by either cancellation or by increasing distance from the field. Cancellation is achieved in two ways. A transmission line circuit consists of three "phases": three separate wires (conductors) on a transmission tower. The configuration of these three conductors can reduce magnetic fields. When the configuration places the three conductors closer together, the interference or cancellation of the fields from each wire is enhanced. This technique has practical limitations because of the potential for short circuits if the wires are placed too close together. There are also worker safety issues to consider if spacing is reduced. In instances where there are two circuits (more than three phase wires), cancellation can be accomplished by arranging phase wires from different circuits near each other. The distance between the source of fields and the public can be increased by either placing the wires higher above ground, burying underground cables deeper, or by increasing the right-of-way. These methods can prove effective in reducing fields because the field strength drops rapidly with distance.

Electric and Magnetic Fields and Other Field-Related Concerns

Additional concerns regarding the Project related to power line fields include radio, television, electronic equipment interference, induced currents and shock hazards, and effects on cardiac pacemakers. Each of these issues is described below.

Radio/Television/Electronic Equipment Interference

Although corona can generate high frequency energy that may interfere with broadcast signals or electronic equipment, this is generally not a problem for transmission lines. Corona is a process by which a current, perhaps sustained, develops from an electrode with a high potential in a neutral fluid, usually air, by ionizing that fluid to create a plasma around the electrode. The Institute of Electrical and Electronic Engineers (IEEE) has published a design guide (IEEE 1971) that is used to limit conductor surface gradients to avoid electronic interference.

Gap discharges or arcs can also be a source of high frequency energy. Gap discharges occur when an arc forms across a gap in loose or worn line hardware. It is estimated that over 90 percent of interference problems for electric transmission lines are due to gap discharges. Line hardware is designed to be problem-free, but wind motion, corrosion, and other factors can create a gap discharge condition. When identified, gap discharges can be located and remedied by utilities.

Electric fields from power lines do not typically pose interference problems for electronic equipment in businesses since the equipment is shielded by buildings and walls. However, magnetic fields can penetrate buildings and walls, thereby interacting with electronic equipment. Depending on the sensitivity of equipment, the magnetic fields can interfere with operation. Review of this phenomenon in regard to the sensitivity of electrical equipment identifies a number of thresholds for magnetic field interference. Interference with typical computer monitors can be detected at magnetic field levels of 10 mG and above, while large screen or high-resolution monitors can be susceptible to interference at levels as low as 5 mG.

Other specialized equipment, such as medical or testing equipment, can be sensitive at levels below 5 mG. Equipment that may be susceptible to very low magnetic field strengths is typically installed

in specialized and controlled environments, since even building wiring, lights, and other equipment can generate magnetic fields of 5 mG or higher.

The most common electronic equipment that can be susceptible to magnetic field interference is probably computer monitors. Magnetic field interference results in disturbances to the image displayed on the monitor, often described as screen distortion, "jitter," or other visual defects. In most cases it is annoying, and at its worst, it can prevent use of the monitor. This type of interference is a recognized problem in the video monitor industry. As a result, there are manufacturers who specialize in monitor interference solutions and shielding equipment. Possible solutions to this problem include relocating the monitor, using magnetic shield enclosures, installing software programs, and replacing cathode ray tube monitors with liquid crystal displays that are not susceptible to magnetic field interference.

Induced Currents and Shock Hazards

Power line fields can induce voltages and currents on conductive objects, such as metal roofs or buildings, fences, and vehicles. When a person or animal comes in contact with a conductive object, a perceptible current or small secondary shock may occur. Secondary shocks cause no physiological harm, but they may present a nuisance.

Cardiac Pacemakers

An area of concern related to electric fields from transmission lines has been the possibility of interference with cardiac pacemakers. There are two general types of pacemakers: asynchronous and synchronous. The asynchronous pacemaker pulses at a predetermined rate. It is generally immune to interference because it has no sensing circuitry and is not exceptionally complex. The synchronous pacemaker, however, pulses only when its sensing circuitry determines that pacing is necessary. Interference from transmission line electric field may cause a spurious signal on the pacemaker's sensing circuitry. However, when these pacemakers detect a spurious signal, such as a 60 Hertz (Hz) signal, they are programmed to revert to an asynchronous or fixed pacing mode of operation, returning to synchronous operation within a specified time after the signal is no longer detected. Cardiovascular specialists do not consider prolonged asynchronous pacing a problem, since some pacemakers are designed to operate that way. Periods of operation in this mode are commonly induced by cardiologists to check pacemaker performance. So, while transmission line electric fields may interfere with the normal operation of some of the older model pacemakers, the result of the interference is generally not harmful and is of short duration (Illinois Institute of Technology Research Institute 1979; University of Rochester 1985).

EMF Associated with the Project Locations

Gen-Tie Line

Where possible, proposed and alternative Gen-Tie Lines would be placed in existing transmission corridors. The Project area a predominantly undeveloped, with minor rural residential development. In undeveloped and natural areas, measurable EMFs are not present except in the vicinity of existing power lines. Public exposure to EMF in undeveloped areas is limited, primarily due to the absence of the public. *The closest sensitive receptors to the Gen-Tie lines would be the Lake Tamarisk development which is approximately 500 feet from the nearest structure within the development.*

Solar Farm and Substation

There are currently no developments generating EMF within the locations of the proposed Project or alternatives for either the Solar Farm or the Red Bluff Substation. The proposed Project would be built in undeveloped open desert, with no EMF sources and limited potential for exposure to EMF sources. The decision on the level of detail sufficient for analysis of potential impacts from EMF associated with the Red Bluff Substation would be made by the CPUC.

3.12 RECREATION

The Project Study Area encompasses the vacant, undeveloped area within the Chuckwalla Valley, portions of which are administered by the BLM. This section describes recreational uses within and around the Project Study Area and any recreational facilities directly or indirectly linked to the area.

3.12.1 Applicable Plans, Policies, and Regulations

The following federal, state, and local laws and policies apply to the administration of recreation within the Project Study Area.

Federal Land Policy and Management Act

FLPMA recognizes the value of public lands and includes the multiple use/sustained yield framework for management to provide for outdoor recreation for future generations (BLM 2001). Title VI of FLPMA, *Designated Management Areas, California Desert Conservation Area*, acknowledges the recreational resources contained within the California desert environment and directs the BLM to develop a multiple use and sustained yield management plan to conserve the desert's resources, particularly recreational use.

California Desert Conservation Area Plan

The CDCA Plan defines Multiple-Use Classes for all BLM-managed lands, which includes the lands within the Project Study Area. The CDCA Plan establishes goals for management of recreation in the California Desert (BLM 1980). The goals are to provide for the use of the public lands and resources of the CDCA, including recreational uses, in a manner that enhances wherever possible—and that does not diminish—the environmental, cultural, and aesthetic values of the desert (BLM 1980). The goals of the Recreation Element of the plan are to:

- Provide for a wide range of quality recreation opportunities and experiences emphasizing dispersed undeveloped use;
- Provide a minimum of recreation facilities. Those facilities should emphasize resource protection and visitor safety;
- Manage recreation use to minimize user conflicts, provide a safe recreation environment, and protect desert resources;
- Emphasize the use of public information and education techniques to increase public awareness, enjoyment, and sensitivity to desert resources;
- Adjust management approach to accommodate changing visitor use patterns and preferences; and
- Encourage the use and enjoyment of desert recreation opportunities by special populations, and provide facilities to meet the needs of those groups.

The CDCA also contains a motorized-vehicle access element, which provides a system and a set of rules that governs access to the CDCA by motor vehicles. The rules include providing for constrained motor-vehicle access, while protecting desert resources (BLM 1980). When the CDCA Plan was first adopted, the BLM designated a network of motorized vehicle routes on public lands within the northern and eastern Mojave Desert. The BLM designated routes for north-central and

southern portions of the CDCA. The BLM manages OHV use, so the conditions of special status species and other natural and cultural resources are maintained (BLM 2004).

Northern and Eastern Colorado Desert Coordinated Management Plan

The NECO Plan, an amendment to the CDCA Plan, provides for management of recreation within the California Desert area of El Centro, Blythe, Needles, and cities in the Coachella Valley, including the Project Study Area (BLM and CDFG 2002). The NECO Plan specifies the types of recreational activities allowed in Multiple-Use Classes on BLM-administered land. Under this plan, new routes may be allowed if approved by the authorized officer. Pit, start, and finish areas must be designated by the authorized officer. All competitive and organized events having 50 or more vehicles require permits. The plan includes an *off-highway vehicles (*OHV*)* route inventory and is the current authority on OHV routes.

Off-Road Vehicles (Title 43 CFR 8340, et seq.)

This regulation establishes criteria for designating public lands as open, limited, or closed to the use of OHVs and for establishing controls governing the use and operation of OHVs in such areas, while protecting resources, promoting safety, and minimizing user conflicts. Recreational use, under Title VI, "includes the use, where appropriate, of off-road recreational vehicles" (BLM 2001).

Riverside County Integrated Plan, General Plan, and Desert Center Area Plan

The Riverside County General Plan includes policy area locations, such as for Desert Center, that have a separate Land Use Plan for future development and growth. The entire Project Study Area falls within the DCAP, which is part of the General Plan. Local land use does not apply to the BLM, but the FLPMA requires the BLM to coordinate with local governments in land use planning in Title II, Section 202, (b)(9).

Additional land use policies are described in more detail in Section 3.9, Lands and Realty.

3.12.2 Affected Environment

Recreation Management Areas. The Solar Farm sites, Red Bluff Substation A, and most of GT-A-1, GT-A-2, and GT-B-2 are on BLM-administered land. The portions of the Project on BLM-administered land are not designated as *Special Recreation Management Areas (SRMA)* but are managed as default Extensive Recreation Management Areas (ERMA). The BLM does not have recreation facilities, trails, or other improvements in the Project area and does not have traffic counters or other means of estimating use. ERMAs normally experience light to moderate dispersed recreation use, including camping, hiking, hunting, and OHV use. The proposed location of the Project includes land that is mostly classified as Multiple-Use Class M (Moderate Use) and some as Multiple-Use Class L (Limited Use). Multiple-Use Class M are lands controlled by a balance between higher intensity recreation use and protection of public lands. These lands are managed to provide a variety of uses, including mining, grazing, recreation, utilities, and energy development. Multiple-Use Class L lands are managed to provide for generally lower intensity, carefully controlled, multiple use of resources (BLM and CDFG 2002). There are no BLM-designated open OHV areas in Riverside County. *O*pen OHV area*s* permit *driving or* rid*ing* off designated routes.

OHV Management/Designations. OHV use is allowed only on BLM land along designated routes that are open to travel per the *NECO Plan Amendment to the CDCA Plan.*

Four designated open routes traverse the Project area in the vicinity of the Solar Farm site (all of which are unpaved): Power Line Road *(660334)*, Kaiser Steel Road *(660335)*, an unnamed route that intersects Kaiser Steel Road *(660298)*, and an unnamed route that runs north-south *from the intersection of* Kaiser Road and Power Line Road *(660260)*. Figure 3.15-1 in the Transportation section (Section 3.15) depicts these roads and their locations. *These OHV routes would remain open to the public during construction of the proposed Solar Farm site, except for unnamed route (660260).*

Power Line Road (NECO Route # 660334)

Power Line Road is a maintained dirt road that runs northeast-southwest and connects with Kaiser Road. The road parallels MWD transmission and distribution lines. OHVs are allowed on this road.

Phone Line Road (NECO Route # 660330)

Phone Line Road is a maintained dirt road that intersects Power Line Road near Eagle Mountain Road, runs north-south, and then turns northeast at the Eagle Mountain Townsite. OHVs are allowed on this road.

Kaiser Steel Road (NECO Route # 660335)

Kaiser Steel Road is a private east-west unmaintained dirt road owned by Kaiser Ventures. The road parallels a Kaiser Ventures distribution line and is used to access two water wells east of the Solar Farm site. OHVs are allowed on this road west of the intersection with Power Line Road. The road is closed east of the intersection with Power Line Road for ecological preservation (First Solar 2009).

Other Roads

Several smaller unpaved and unmaintained local roads or routes have been documented in the project vicinity and are shown on Figure 3.15-1.

Developed Recreation Sites. A recreational use in the Project Study Area is the Desert Center Airport, southwest of the Solar Farm site, previously owned and operated by Riverside County but now privately owned. The airport consists of one paved 4,200-foot-long 50–foot-wide runway, a pilot lounge, storage building, beacon tower, and hangar (Riverside County Economic Development Agency 2010). The airport has been redeveloped for use as a private, members-only automotive racetrack, with spaces for recreational vehicles (no utility hook-ups) (Riverside County TLMA 2010; Riverside County Planning Department 2009).

Another recreational development is the Lake Tamarisk Resort, approximately five miles south of the Solar Farm area and next to a portion of GT-A-1 and GT-B-2. This member-owned resort has 60 members and 150 mobile home spaces, mobile home rentals, camping spaces, a heated pool, a clubhouse, and a nine-hole public golf course.

Dispersed Recreation. Although not within the proposed Project, the Desert Lily ACEC is a recreation attraction near the proposed Project. This ACEC covers 2,031 acres and was established to protect botanical values, in particular, the desert lily (*Hesperocallis undulata*). This area is withdrawn from all forms of appropriation including mineral entry, and is bound on the western edge by a fence bordering Highway 177. It is 2.6 miles southeast of the Solar Farm layouts A, B, and C area. The use of this ACEC is a few hundred visitors per year but includes a car and RV camping area, along with recreation activities, such as photography and nature studies.

Joshua Tree National Park surrounds the northern portion of the Project Study Area. The Joshua Tree Wilderness Area (discussed in Section 3.14 – Special Designations), on the southern tip of the Coxcomb Mountains, is less than two miles to the east of the Solar Farm site at its closest point. The Joshua Tree Wilderness Area is composed of arroyos, playas, bajadas, narrow ravines, and steep mountains. *Some visitors are likely to access this area because of its proximity to Highway 177, though in general, because* of the steep terrain and lack of trails, much of the park in this area is difficult to access. As a result, most of the recreation use closest to the Project Area is highly dispersed, with visitors seeking opportunities for day hiking, backpacking, and other forms of nonmotorized recreation. Motorized vehicles must stay on established roads. Aerial photography and the Park Service's visitor brochure reveal no significant trails, routes, or other park improvements within eight miles of the Project boundary. A visitor study was completed in spring 2004, but specific data are not available for visitor use and visitor preferences for dispersed recreation areas next to the proposed Project.

Chuckwalla Mountains and Palen-McCoy Wilderness Areas, administered by the BLM, are located approximately 8 miles south and 10 miles east of the Project Study Area. These dispersed recreation areas are within the viewshed of the Project Study Area and are discussed in Section 3.14-Special Designations.

Other recreation near the Project Study Area, but not within it, is the Edmund C. Jaeger Nature Sanctuary, about a quarter-mile south of Red Bluff Substation B. In addition, Corn Springs Campground, about 20 miles south of the Project (south of I-10, surrounded by the Chuckwalla Mountains Wilderness), which averages 300 campers a year (Hill 2010). *The developed Wiley's Well and Coon Hollow Campgrounds are within the Mule Mountain Long Term Visitor Area (LTVA), located about 35 miles southeast of the Project Study Area, and Midland LTVA is 45 miles east from the Project Study Area (Cook 2010).* LTVAs are long-term permit areas where "snow birds" can stay all winter in self-contained recreational vehicles (normally camping is limited to 14 days on public land). There are no facilities or services, except for a volunteer host, information kiosk, and vault toilet (no water). Each averages about 52 *long term* visitors a year (Hill 2010). Chiraco Summit, the location of the General Patton Museum, is 19 miles west of Desert Center, on BLM land but administered by a nonprofit group (Hill 2010).

General Project Site Recreation Use. Although recreation use in the vicinity of the Project site is minimal, some uses have been observed by BLM staff and ranger patrols. The most common recreation use would be driving for pleasure or sightseeing, in both street legal vehicles and OHVs on approved routes. Car or RV camping may occur but has not been observed and is not considered a popular use. Day use of the area is most common, mostly by residents of Desert Center or off-duty workers from facilities around Eagle Mountain. Some hiking, photographer, target shooting, and limited hunting is assumed to occur in the general area *other* than on the project site. Though the project site is near Joshua Tree National Park, access to the park and wilderness from this area is not common and has not been observed by BLM staff.

3.13 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

This section provides an overview of the applicable plans, policies, and regulations and existing conditions, historic trends, and relevant projections for population and housing, employment and income, public services and utilities, and environmental justice. Data is provided for Riverside County, for local communities where applicable and available, and for California for comparison.

3.13.1 Applicable Plans, Policies, and Regulations

Federal

Applicable plans, policies, and regulations for socioeconomics and environmental justice include NEPA (42 United States Code [USC] 4321 et seq.) and Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. NEPA requires an analysis of the proposed Project's economic, social, and demographic effects related to effects on the natural or physical environment in the affected area, but does not allow for economic, social, and demographic effects to be analyzed in isolation from the physical environment. Executive Order 12898 requires that federal agencies, as well as state agencies receiving federal funds, identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations.

State

California state regulations regarding socioeconomics and environmental justice (including the provision of public services and utilities) that apply to the proposed Project include Title 14 of the California Code of Regulations, Chapter 3, Guidelines for Implementation of the California Environmental Quality Act, Article 9(a), Section 15131; California Education Code, Section 17620; California Government Code, Sections 65996–65997; and California Revenue and Taxation Code, sections 721–725: California Board of Equalization (BOE) – Property Tax Rule 905 (BOE authority to assess electrical generating facilities is found in Article XIII, section 19, of California's Constitution).

CEQA Article 9(a), Section 15131, states the following with regard to economic and social effects:

- Economic or social effects of a project shall not be treated as significant effects on the environment. An EIR may trace a chain of cause and effect from a proposed decision on a project through anticipated economic or social changes resulting from the project to physical changes caused in turn by the economic or social changes. The intermediate economic or social changes need not be analyzed in any detail greater than necessary to trace the chain of cause and effect. The focus of the analysis shall be on the physical changes.
- Economic or social effects of a project may be used to determine the significance of physical changes caused by the project. For example, if the construction of a new freeway or rail line divides an existing community, the construction would be the physical change, but the social effect on the community would be the basis for determining that the effect would be significant. As an additional example, if the construction of a road and the resulting increase in noise in an area disturbed existing religious practices in the area, the disturbance of the religious practices could be used to determine that the construction and use of the road and the resulting noise would be significant effects on the environment. The religious practices would need to be analyzed only to the extent to show that the increase in traffic and noise

would conflict with the religious practices. Where an EIR uses economic or social effects to determine that a physical change is significant, the EIR shall explain the reason for determining that the effect is significant.

- Economic, social, and particularly housing factors shall be considered by public agencies together with technological and environmental factors in deciding whether changes in a project are feasible to reduce or avoid the significant effects on the environment identified in the EIR. If information on these factors is not contained in the EIR, the information must be added to the record in some other manner to allow the agency to consider the factors in reaching a decision on the project.

The other California regulations pertain to social infrastructure and government revenues. Section 73 of the California Revenue and Taxation Code allows a property tax exclusion for certain types of solar energy systems installed between January 1, 1999, and December 31, 2016. This section was amended in 2008 to include the construction of an active solar energy system incorporated by an owner-builder in the initial construction of a new building that the owner-builder does not intend to occupy or use.

California Education Code, Section 17620, authorizes the governing board of any school district to levee a fee, charge, dedication, or other requirement for the purpose of funding the construction or reconstruction of school facilities. California Government Code, Sections 65996–65997 includes provisions for school district levies against development projects. Property Tax Rule 905 allows for the assessment of taxes on electric generation facilities.

The responsibilities of California utility operators working in the vicinity of utilities are detailed in Section 1, Chapter 3.1, "Protection of Underground Infrastructure" (Article 2 of California Government Code §§42 16-4216.9). This law requires that an excavator must contact a regional notification center at least two days prior to excavation of any subsurface installation. Any utility provider seeking to begin a project that may damage underground infrastructure can call Underground Service Alert, the regional notification center. Underground Service Alert will notify the utilities that may have buried lines within 1,000 feet of the project. Representatives of the utilities are required to mark the specific location of their facilities within the work area prior to the start of project activities in the area.

The Integrated Waste Management Act of 1989 (PRC 40050 et seq. or Assembly Bill (AB 939, codified in PRC 40000), administered by the California Integrated Waste Management Board (CIWMB), requires all local and county governments to adopt a Source Reduction and Recycling Element to identify means of reducing the amount of solid waste sent to landfills. This law sets reduction targets at 25 percent by the year 1995 and 50 percent by the year 2000. To assist local jurisdictions in achieving these targets, the California Solid Waste Reuse and Recycling Access Act of 1991 (SWRR) requires all new developments to include adequate, accessible, and convenient areas for collecting and loading recyclable and green waste materials.

Local

The proposed Project would affect only unincorporated areas in Riverside County, including the unincorporated town of Desert Center. The relevant plans for each of these jurisdictions include land use direction, policy guidance, and consistency zoning. The Riverside County General Plan was

updated in 2008 to incorporate 19 more detailed Area Plans, including one for Desert Center. The Fiscal/Financial Analysis evaluates the potential for population and economic growth over the next 20 years, and the General Plan identifies areas suitable for development of the economic base and transportation system of Riverside County. The land use element designates the distribution and intensities of use, including residential, commercial, industrial, public facilities, and open space, for the entire county. The safety element establishes policies and programs to protect the community from risks associated with seismic, geologic, flood, and wildfire hazards; and the multipurpose open space element provides management of the availability for parks. The housing element assesses housing needs and proposes residential sites for all economic segments of the county.

The Desert Center Area Plan (DCAP) identifies the limited areas available for development. Most of the area covered by the DCAP is remote, inaccessible, subject to natural hazards, or unable to support intense development due to a lack of public infrastructure and services. The plan, therefore, recommends infill development and expansion areas contiguous to existing development. Guidance is provided for the transition of the former Kaiser iron ore mining facility to a Class III nonhazardous waste landfill (Eagle Mountain Landfill) with the former Kaiser employee housing area becoming a housing and service area for landfill employees (although a recent legal ruling has halted the landfill project). The area between Desert Center and Lake Tamarisk Park could accommodate limited future expansion, accompanied by a plan amendment; and growth in the area of the airport would be subject to restrictions due to public safety considerations (Riverside County 2003).

3.13.2 Existing Conditions

Regional Setting and Approach to Data Collection

This section presents an overview of the regional setting and comprehensive baseline population, housing, and employment data, as well as information on utilities and public services within the study area and the ROI for socioeconomic resources, which involves three subsets:

- The discussion of income and employment includes all of Riverside County because this is the area from which the labor force would be drawn, according to the Plan of Development prepared by Sunlight;
- The discussion of public services and facilities also includes a large portion of Riverside County since, in general, these are supplied from a wider area than the unincorporated communities next to the proposed Project and by regional providers; and
- The discussion of the area that would be affected with respect to social values, the potential for disruption of businesses, and potential disruption of utilities and public services is limited to Desert Center, Lake Tamarisk Park, and Eagle Mountain Village, as well as to businesses and residences next to construction activities.

The terms “regional” or “ROI” are used to describe employment and income and the supply area from which public services and facilities are derived; the term “local” is used to describe social values, individual businesses, and the area where public services and utilities could be affected by the proposed project.

The Project Study Area lies entirely within unincorporated Riverside County, as do the alternative transmission corridors and substation sites. The proposed Project would be located entirely on

BLM-administered land, but portions of the Gen-Tie Line corridor would traverse private land. The nearest populated areas include the unincorporated town of Desert Center, the Lake Tamarisk Park area, and Eagle Mountain Village. The nearest incorporated population centers include Blythe, Coachella, and Indio in Riverside County and Twentynine Palms in San Bernardino County.

Most of the land that would be affected by the proposed Project is administered by the BLM, which contributes to the social and economic characteristics of the area, primarily by providing recreation and mineral resources and energy development. Socioeconomic data were collected for jurisdictions in the vicinity of the proposed Project that could be affected and would contribute to the construction labor force. Demographic, economic, and environmental justice data are derived from the California Department of Finance (CADOF), the US Bureau of Economic Analysis (BEA), the BLM, Sunlight, and Riverside County. Public services and utility information was collected from planning documents or other published information from the jurisdictions in the study area and Sunlight.

Population and Housing

There are 26 incorporated areas within Riverside County, where the majority (about 78 percent of its population) resides. With a population of 2,107,653 as of January 2009, it ranks as the fourth most populous of California's 58 counties, after Los Angeles, San Diego, and Orange Counties. Table 3.13-1 shows the historic population data (for 1990 and 2000) and the most current population data for Riverside County and the state. As identified in Table 3.13-1, the population of Riverside County grew by more than twice the rate of the state between 1990 and 2000 and between 2000 and 2009. Between 1990 and 2000, Riverside County became home to an increasing percentage of the state's population. Also during this period, the population in incorporated areas was greater than in unincorporated areas, and most population growth occurred in incorporated areas (CADOF 1990, 2007a, and 2009b). The most current population counts for unincorporated areas in Riverside County are available from the US Census Bureau for the 2000 Census. As of 2000, Census Block data show that the population of Desert Center is 51, based on 16 census blocks analyzed; Eagle Mountain Village is 576, based on the 25 census blocks analyzed, and Lake Tamarisk Park is 215, based on the six census blocks analyzed. Since 2007, the dominant source of population increase has been from natural increase; whereas, in the previous years since 1999 in-migration dominated the population increase in Riverside County (CADOF 2009a).

As shown in Table 3.13-2, the population of Riverside County is forecast to grow by a greater percentage than the State throughout the planning period, increasing by almost 57 percent between 2010 and 2030 (CADOF 2007b).

In Riverside County, the vacancy rate in 2009 for single- and multiple-family housing units and mobile homes was approximately 13 percent, with vacancy in the unincorporated portion of the County at 15 percent. In the incorporated portion of the County, it was over 12 percent. Table 3.13-3 identifies the housing vacancy of the incorporated areas nearest to the study area. Indio had the highest vacancy rate of the nearby cities and the largest number of vacant units.

Table 3.13-1
Current and Historic Population

Location	1990	2000	Percent Change 1990–2000	2009	Percent Change 2000–2009
Riverside County (Number)	1,144,400	1,535,125	34.14	2,107,653	37.30
Riverside County (Percent of State Total)	3.87	4.55		5.50	
Incorporated	765,800	1,117,163	45.88	1,648,465	47.56
Blythe	13,271	20,465	29.14	21,346	4.30
Coachella	17,139	22,724	32.58	41,043	80.61
Indio	37,691	49,116	30.31	82,325	67.61
Unincorporated	378,600	417,962	10.40	459,188	9.86
California	29,558,000	33,721,583	14.09	38,292,687	13.56

Source: CADOF 1990, 2007a, 2009a, and 2009b

Table 3.13-2
Population Projections

Year/Location	Population	Percent Change
2010		
Riverside County	2,239,053	
California	39,135,676	
2020		
Riverside County	2,904,848	29.74
California	44,135,923	12.78
2030		
Riverside County	3,507,498	20.75
California	49,240,891	11.57
2010 to 2030 Change		
Riverside County	1,268,445	56.65
California	10,105,215	25.82

Source: CADOF 2007b.

Table 3.13-3
2009 Housing Characteristics

Location	Total Housing Units	Percent Vacant	Number Vacant
Riverside County	780,112	13.14	102,507
Incorporated	609,938	12.57	76,669
Blythe	5,468	16.11	881
Coachella	8,873	4.38	389
Indio	27,899	17.97	5,013
Unincorporated	170,174	15.19	25,849
Twenty-nine Palms, San Bernardino County	9,195	13.53	1,244

Source: CADOF 2009c

Although research shows that construction workers would commute as much as two hours each direction from their communities rather than relocate (BLM and CEC 2009), and Sunlight has indicated that, to the extent possible, the labor force for the proposed project would be derived from Riverside County (much of which is within this two-hour commute window), some employees may choose temporary lodging facilities closer to the project site in nearby municipalities. The Atlas Hospitality Group tracked the number of hotels and rooms available in Riverside County in 2008, which totaled approximately 22,508 rooms and 242 properties, as of December 2008 (Pierceall 2009). Relative to the proposed Project area, the closest municipality to the east is Blythe, at approximately 48 miles, and to the west is Indio, at approximately 49 miles, where there are about 35 lodging facilities offering an average of roughly 55 rooms per facility. Although availability and lodging cost is subject to change based on season and demand, room rates range between $40 and $120. Municipalities to the north and south, such as Twentynine Palms and Brawley, would be less likely to provide lodging that would be appropriate in terms of proximity or cost.

Employment and Income

During construction, the Project construction workforce is expected to average approximately 405, with a peak of 532 total on-site workers. The workforce for the Gen-Tie Line is expected to average 25 employees over the 20-month Gen-Tie construction period, with a peak of approximately 60 employees; and the workforce for the on-site substation is expected to average 10 people, with a peak of 30 employees. The total Project workforce is expected to peak at 630 employees, approximately 0.78 percent of the total number of construction employees identified in Table 3.16-4. As previously stated, Sunlight has indicated that the construction workforce would be recruited from within Riverside County and elsewhere in the surrounding area, as available (First Solar 2010) and, based on research (BLM and CEC 2009), would not be expected to relocate from Riverside County and closer to the project site. Table 3.13-4 provides the most current data available on employment sectors in Riverside County. As shown in Table 3.13-3, most industry sectors in Riverside County provided similar levels of employment to those of the state, except for construction, which was one of the largest employment sectors in Riverside County, with almost five percent more of the population employed than at the state level. Government was the largest employer in Riverside County, with local government providing the majority of the employment in this sector.

The historic trend between 1990 and 2000 shows that the labor force in Riverside County increased by about 27 percent, and the unemployment rate decreased from 7.2 percent to 5.4 percent. Between 2000 and 2007 the labor force increased by another 34 percent, but unemployment also increased to 6.0 percent. By 2008 unemployment had reached an annual average of 8.6 percent, with a total of 78,967 unemployed out of a labor force of 918,845 (BLS 2009a). In April 2009 and 2010 the percentage of unemployment in California, at 11.0 percent and 12.6 percent, was lower than for Riverside County at 12.2 percent and 14.3 percent, for these years (BLS 2010a and 2010c).

Between 1980 and 2007, per capita personal income in Riverside County remained below the State average, with a gap that has widened in almost every year. The widest gap between the County and State averages was in 2007 at $12,245. In 2007, per capita personal income in Riverside County was $29,560; while, the State average was $41,805. High average per capita incomes in San Francisco, San Mateo, Santa Clara, Contra Costa, Napa, and Orange Counties helped to boost the overall State average (BEA 2009b).

Table 3.13-4
2008 Employment by Industry

NAICS Industry	Riverside County Employment (Number)	Riverside County Employment (Percent of Total County Employment)	California Employment (Percent of Total State Employment)
Total employment	864,108		
Farm employment	8,121	0.94	1.06
Nonfarm employment	855,987	99.06	98.94
Private employment	724,411	83.83	85.86
Forestry, fishing, and related activities	7,573	0.88	1.02
Mining	1,527	0.18	0.24
Utilities	1,928	0.22	0.29
Construction	79,752	9.23	5.49
Manufacturing	53,842	6.23	7.24
Wholesale and Retail trade	133,269	15.43	13.69
Transportation and warehousing	28,621	3.31	3.00
Finance, insurance, and information	41,056	4.76	7.27
Real estate and rental and leasing	46,674	5.40	5.48
Professional, scientific, and technical services	45,538	5.27	8.61
Management of companies and enterprises	3,811	0.44	1.02
Administrative and waste services	57,975	6.71	6.36
Educational services	10,129	1.17	2.00
Health care and social assistance	71,326	8.25	8.69
Arts, entertainment, and recreation	18,847	2.18	2.64
Accommodation and food services	68,681	7.95	6.85
Other services, except public administration	53,862	6.23	5.97
Government and government enterprises	131,576	15.23	13.08
Federal, civilian	6,729	0.78	1.18
Military	3,514	0.41	1.06
State and local	121,333	14.04	10.84
State government	13,296	1.54	2.36
Local government	108,037	12.50	8.48

Source: BEA 2010.

Public Services and Utilities

The public services and utilities in Riverside County discussed in this section include schools, hospitals, fire response, police departments, electrical and natural gas service, water districts, and cable and telecommunications suppliers, since these are services that could be affected either by construction of the proposed Project or population growth if it were to result from the proposed Project.

There were 467 schools in Riverside County in the 2008 to 2009 fiscal year, with a total enrollment of 420,159 students and a pupil-to-teacher ratio of 22.2. These schools included 277 elementary schools with 197,328 students, 74 middle schools with 83,945 students, 55 high schools with 119,177 students, and 5 kindergarten-through-twelfth-grade schools with 4,093 students. The Desert Center Unified School District provides the nearest school closest to the project area: Eagle Mountain Elementary School, which had an enrollment of 14 students in 2008 to 2009 and is

located along Kaiser Road in the project study area. Palo Verde Valley High School and Palo Verde College are about 40 miles southeast of the Project Study Area along I-10. Indio High School, La Quinta High School, *and* Page Middle School are about 45 miles southwest of the Project Study Area along I-10, and Twentynine Palms High School in San Bernardino County, north of Joshua Tree National Park *is the nearest school to the north* (Education Data Partnership 2010).

Thirty-one hospitals are located in Riverside County. Closest to the Project Study Area are Palo Verde Hospital in Blythe, John F. Kennedy Memorial Hospital in Indio, Eisenhower Medical Center in Rancho Mirage, and Desert Regional Medical Center in Palm Springs, High Desert Medical Center in Joshua Tree (San Bernardino County), and Angel View Children's Hospital in Desert Hot Springs (California Gazetteer 2010).

All fire stations in Riverside County are dispatched by the California Department of Forestry and Fire Protection (CAL FIRE) Riverside Unit/Riverside County Fire Department Emergency Command Center and are part of the "Integrated Fire Protection System," under contract with the State. Ninety-nine fire stations or dispatch centers are within Riverside County, of which 84 have paramedic firefighters, seven are fire stations only, five are volunteer fire companies only, and three are municipal fire departments that contract with Riverside County for dispatch services. Closest to the Project Study Area are the Lake Tamarisk Fire Station in Desert Center (with one County paramedic assessment engine), Blythe Air Base in Blythe (with one County paramedic assessment engine), Riverbend Volunteer Fire Department in Blythe, La Quinta South Fire Station in La Quinta (with one City paramedic assessment engine and one County brush engine), Coachella Fire Station (with one City paramedic assessment engine), Sun City Shadow Hills Station in Indio (with one City paramedic assessment engine), and Indio, North Indio, and West Indio Fire Stations in Indio (Riverside County Fire Department 2010).

The Riverside County Sheriff's Department provides police services in unincorporated Riverside County and provides contract services to individual municipalities in Riverside County. The Colorado River Station in Blythe provides service to the unincorporated area from Red Cloud Road on the west, to the Arizona state line on the east, and the Imperial County line on the south to the San Bernardino County line on the north. Communities included in this area are Desert Center, Eagle Mountain, East Blythe, Hayfield, Midland, Nicholls Warm Springs, Ripley and the Colorado River (Riverside County Sheriff's Department 2010). Similarly, the Project area falls within the Border Division of the California Highway Patrol. This division has twelve area offices: Blythe, San Juan Capistrano, El Cajon, Imperial, Indio, Oceanside, San Diego (division office), Beaumont, Santa Ana, Temecula, Westminster, and Felicity. Additionally, the Border Division of the Highway Patrol contains four residential posts, five commercial inspection facilities, two transportation management centers, 900 uniformed officers, and 380 nonuniformed personnel (California Highway Patrol 2010).

SCE provides electric power service to the Project Study Area. An existing SCE 161-kV transmission line crosses Eagle Mountain Road, Kaiser Road, and Desert Center Rice Road from the northwest to the southeast from about one mile north of the Eagle Mountain Substation toward Blythe, and the SCE Devers Palo Verde transmission line is along I-10 on the south side of the highway. MWD owns the Eagle Mountain Substation along Powerline Road, as well as the 230-kV transmission line and 33-kV distribution line along Powerline Road. The Colorado River Aqueduct, also owned by MWD, bends around the northern end of the Project Study Area and then runs from

north to south next to the western boundary of the Project; the aqueduct is underground at this location (First Solar 2010).

Additional public utilities in the study area are provided by the following:

- Water: MWD;
- Natural Gas: Southern California Gas Company;
- Waste Management: Riverside County Waste Management Department; and
- Telecommunications: Sprint Communications, AT&T Communications, and AT&T California.

Environmental Justice

Several steps have been undertaken in order to comply with Executive Order 12898, protecting low income and minority populations from disproportionate impacts from the proposed Project, including public outreach and a screening analysis of potential environmental justice populations in the vicinity of the proposed Project. The public has been provided access to project documentation and been included in the EIS process through various forms of outreach. Public outreach to the communities and residents that potentially could be affected by the proposed Project and alternatives, including low-income and minority populations, is discussed in Section 5.3 (Public Participation Summary) and includes public scoping. In addition, the BLM has engaged in official government-to-government consultation with all Native American tribes that could be affected by the proposed Project, transmission tie-in lines, and substation alternatives.

The intention of an environmental justice screening analysis is to determine whether a low-income and/or minority population exists within the potential affected area of a proposed Project. As defined by the "Final Guidance for Incorporating Environmental Justice Concerns" contained in the Guidance Document of the US EPA's NEPA Compliance Analysis (EPA 1998), minority and low-income populations are identified where either:

- The minority or low-income population of the affected area is greater than 50 percent of the affected area's general population; or
- The minority or low-income population percentage of the affected area is meaningfully greater (50 percent or greater per EPA Guidance Document) than the minority or low-income population percentage in the general population of the jurisdiction or other appropriate unit of geographic analysis (i.e., County, State, or Native American Reservation) where the affected area is located.

The screening analysis presented in this section investigates the distributional patterns of minority populations and low-income populations on a regional basis and characterizes the distribution of such populations adjacent to the proposed and alternative segments. The impacts analysis in Chapter 4 focuses on these existing environmental conditions and the effects relative to these populations to determine how project impacts could affect these populations, focusing on possible disproportionate effects and potential exacerbation of existing conditions.

In 1997, the President's Council on Environmental Quality issued Environmental Justice Guidance that defines minority and low-income populations as follows:

- "Minorities" are individuals who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black not of Hispanic origin; or Hispanic (without double-counting non-white Hispanics falling into the Black/African-American, Asian/Pacific Islander, and Native American categories)
- "Low-income populations" are identified as populations with mean annual incomes below the annual statistical poverty level.

Census Block Group data concerning poverty levels and the racial and ethnic population distribution provide the finest scale of screening data that is widely available; however, the most recent information dates back to 2000. Therefore additional, more recent, county-level data is provided to supplement this information and identify the direction of changes to the income, racial, and ethnic composition of the study area. Census Block Group data, Census Tract data, county data, and state averages are compared to determine whether the local ethnic and poverty distribution differs from the California average. The study area lies entirely within one Census Tract (458) in Riverside County, and all of the built components and adjacent communities lie within Block Groups 3, 5, and 6 of this Census Tract.

If these three Census Block Groups have a combined population of 50 percent or greater for either minority or low-income population groups, it is identified for a more detailed analysis of whether the proposed Project would produce physical or socioeconomic effects that could adversely impact the identified groups. If the Project Census Groups' minority and low-income populations are 50 percent or less for any of these categories, no further environmental justice analysis was performed on the jurisdiction.

Table 3.13-5 shows that for Census Block Groups 3, 5, and 6, in which all elements of the proposed Project are situated had a higher percentage of Black or African American, American Indian and Alaska Native, Native Hawaiian and Other Pacific Islander, Some Other Race, and Hispanic minority populations than the county average or state average in 2000. The Asian portion of the population for Census Block Groups 3, 5, and 6 and in the Census Tract was 2.23 percent lower and 2.26 percent lower than the average for Riverside County, respectively, and 9.46 percent lower than the average for California. Data from 2007 indicate that the overall percentage of minorities increased for both Riverside County and the state, and of the minorities to proportion of Hispanic and Asian minorities increased. Overall, in 2000 the minority population for Census Block Groups 3, 5, and 6 was 71.15 percent and for Census Tract 458 was 70 percent, while that of the county and state were 46.63 percent and 50.43 percent. A more detailed analysis of potential impacts on minorities is provided in Chapter 4.

The US Census Bureau uses a set of money income thresholds that vary by family size and composition to determine which families are living in poverty. If a family's total income is less than its threshold, then that family, and every individual in it, is considered to be living in poverty. The poverty thresholds do not vary geographically, but they are updated annually for inflation using the Consumer Price Index. For example, in 1999 the average estimated poverty threshold for an individual was an annual income of $8,501, and for 2008 it was $10,991 (US Census 2009a and 2009b). According to US Census 2000 estimates (Table 3.13-6), the percentage of the population below the poverty line of Census Tract 458 was greater than that of either Riverside County or the State in 1999; although, it was well below 50 percent of the population. However, the percentage of

Table 3.13-5
Population by Percentage Race / Ethnicity

Year	2000				2007	
Percent Race / Ethnicity	Block Group 3,5, and 6 for Census Tract 458	Census Tract 458	Riverside County	California	Riverside County	California
White	26.71	27.92	51.04	46.70	40.83	41.32
Black or African American (Not Hispanic)	21.39	20.68	5.98	6.44	5.19	6.18
American Indian and Alaska Native (Not Hispanic)	0.78	0.84	0.66	0.53	0.75	0.56
Asian (Not Hispanic)	1.34	1.31	3.57	10.77	5.87	12.06
Native Hawaiian and Other Pacific Islander (Not Hispanic)	0.35	0.34	0.21	0.31	0.22	0.36
Some other race (Not Hispanic)	1.26	1.21	0.16	0.21	NA	NA
Two or more races (Not Hispanic)	0.88	0.85	2.17	2.67	2.34	2.60
Hispanic of All Races	47.29	46.83	36.21	32.38	44.82	36.91
All Minorities	71.15	70.00	46.63	50.43	56.85	56.07

Source: US Census Bureau 2000a and 2000b, CADOF 2009d.

Table 3.13-6
Poverty Characteristics

	1999		2008	
Location	Poverty Line Income for Individuals	Percent Below Poverty Line	Poverty Line Income for Individuals	Percent Below Poverty Line
Census Tract 458	$8,501	21.4	NA	NA
Census Block Groups 3, 5, and 6	$8,501	4.3	$10,991	NA
Riverside County	$8,501	14.2	$10,991	12.6
California	$8,501	14.2	$10,991	13.3

Source: US Census Bureau 2000c, 2002, 2009b, and 2009c

the population below the poverty line in Census Blocks 3, 5, and 6 were below that of Riverside County and the state at 4.3 percent. In 1999, the median household income for Census Tract 458 was about 70 percent of the Riverside County average and 63 percent of the State average (US Census 2000c). In 2008, the percentage in poverty in Riverside County dropped below the State average; while, the median income for the County continued to be lower than the State average (US Census 2009c). Poverty data for Census Blocks 3, 5, and 6 for 2008 are not available.

3.14 SPECIAL DESIGNATIONS

3.14.1 Applicable Plans, Policies, and Regulations

Federal Regulations

Federal Land Policy Management Act of 1976

The designation of *Areas of Critical Environmental Concern (*ACECs) was authorized in Section 202 (c)(3) of FLPMA, and was designed to be used as a process for determining the special management required by certain environmental resources or hazards (BLM 1980). According to Section 103(a) of FLPMA, an ACEC is defined as the following:

> *An area within the public lands where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards.*

Prior to its designation, management prescriptions are developed for each proposed ACEC. These prescriptions are site-specific and include actions that the BLM has authority to carry out, as well as recommendations for actions that the BLM does not have direct authority to implement, such as cooperative agreements with other agencies and mineral withdrawals (BLM 1980).

Wilderness Act of 1964

Wilderness Areas (WA) are designated by Congress, under the authority of the Wilderness Act of 1964 as part of the National Wilderness Preservation System, and are managed by one of the following four land management agencies: the BLM, the US Fish and Wildlife Service (USFWS), the US Department of Agriculture (USDA), the Forest Service, or the National Park Service.

According to the Wilderness Act, wilderness is defined as the following:

> (c) A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this chapter an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value. (Public Law 88-577, Section 2[c])

A number of uses are specifically prohibited within WAs. Prohibited uses include commercial enterprises; permanent and temporary roads (with exceptions for administration and emergency purposes); use of motorized vehicles, equipment, motorboats, or mechanical transport; landing of aircraft; or the erection of a structure or installation (Public Law 88-577, Section 4[c]).

California Desert Protection Act of 1994

The CDPA designated 69 WAs on BLM-managed public lands in the California Desert. The CDPA states that "wilderness is a distinguishing characteristic of the public lands in the California desert." and "The wilderness values of desert lands are increasingly threatened by . . . development." The CDPA further states that there are no buffer zones designated along with wilderness areas: "The fact that nonwilderness activities or uses can be seen or heard from areas within a wilderness area shall not, of itself, preclude such activities or uses up to the boundary of the wilderness area [Public Law 103-433, Section 103(d)].

BLM Policy and Plans

BLM Manual 8560, Management of Designated Wilderness Areas

This manual section identifies BLM's role in administering WAs on public lands, provides policy guidance for BLM personnel, and sets the framework for wilderness management program development. It states the goals of wilderness management, as well as administrative functions and specific activities related to wilderness management.

California Desert Conservation Area Plan

The CDCA is a 25-million acre expanse of land in Southern California designated by Congress in 1976 through FLPMA. The BLM administers about 10 million of those acres. When Congress created the CDCA, it recognized its special values, proximity to the population centers of Southern California, and the need for a comprehensive plan for managing the area. Congress stated that the CDCA Plan must be based on the concepts of multiple use, sustained yield, and maintenance of environmental quality. The proposed project falls within the CDCA. The primary active wildlife management tools used in the CDCA Plan are ACECs. Refer to Sections 3.3 (Vegetation), 3.4 (Wildlife), and 3.9 (Lands and Realty) for a more detailed discussion of the CDCA Plan.

Northern and Eastern Colorado Desert Coordinated Management Plan

The Northern and Eastern Colorado Desert Coordinated Management Plan (NECO) was prepared under the regulations implementing the FLPMA. The NECO established regional standards for public land health and set forth guidelines for grazing management. The NECO plan also established two Desert Wildlife Management Areas (DWMAs) encompassing 1.75 million acres that are managed as ACECs for recovery of the desert tortoise. Southern Mojave and Sonoran Wildlife Habitat Management Areas (WHMAs) for bighorn sheep were established totaling over one million acres and 13 multi-species WHMAs totaling over a 500 million acres such that 80 percent of the distribution of all special status species and all natural community types are included in conservation areas. The NECO plan also combined herd management areas for wild burros and horses, designated routes of travel, identified principles for acquisition of private lands and disposal of public lands, provided access to resources for economic and social needs; and incorporated 23 wilderness areas established by the 1994 CDPA in the CDCA.

Local Regulations

County of Riverside General Plan, Desert Center Area Plan, 2003

This Plan describes a multi-purpose open space element for the unincorporated areas of Riverside County and Desert Center. It defines local open space policies that relate to wildlife habitat,

particularly desert tortoise, and aims to preserve the desert environment. The three local open space policies defined for Desert Center within the Riverside County General Plan are:

- Encourage clustering of development for the preservation of contiguous open space;
- Work to limit OHV use within the Desert Center Area Plan; and
- Require new development to conform with Desert Tortoise Critical Habitat designation requirements.

A more specific discussion of the Riverside County General Plan is provided in Section 3.9, Lands and Realty.

3.14.2 Existing Conditions

The locations of all special designations near the Project are shown in Figure 2-1.

Areas of Critical Environmental Concern

There are *three* ACECs near the proposed Project area, the Alligator Rock ACEC, Desert Lily Preserve ACEC, *and Chuckwalla DWMA. The first two* ACECs were officially designated with the approval of the CDCA Plan in 1980. No Project activities are proposed within an ACEC, although Access Road 1 for Red Bluff Substation A is next to the Alligator Rock ACEC. *The Chuckwalla DWMA was designated as an ACEC through the Northern and Eastern Colorado Desert Coordinated Management Plan. The discussion for this special area is found in Wildlife-Section 3.4.6.*

Alligator Rock ACEC

Covering 7,726 acres, this ACEC was established to protect archaeological values. Activities represented at archaeological sites within the ACEC include milling of seeds and other food products, the manufacture of stone tools, storage of food and other items, temporary habitation, travel, trade, hunting, artistic endeavor, and possibly religious or ritual activity. The Alligator Rock ACEC was so designated not only because of the unusual array of archaeological sites present, but also because these sites are seriously endangered by current use of the area for a number of activities, particularly recreation. Two sites within the ACEC have been listed on the National Register of Historic Places (BLM 1986c).

Actions taken to protect the sensitive resources within this ACEC include designating road closures in certain areas to prevent vehicular damage to archaeological sites, and implementing physical protection measures, continued inventorying, and monitoring (BLM 1986c). Its boundary is located 550 feet west of Red Bluff Substation A, and Substation B shares a portion of its eastern boundary with the ACEC.

Desert Lily Preserve ACEC

This ACEC covers 2,031 acres and was established to protect botanical values, in particular, the desert lily (*Hesperocallis undulata*). This area is withdrawn from all forms of appropriation including mineral entry, and is bound on the western edge by a fence bordering Highway 177. It is located 2.6 miles southeast of the Solar Farm area. This ACEC has a parking area and is one of the few "attractions" near the Project. This site is also being used as a Key Observation Point (KOP) for the

Visual Resource Management analysis. Use of the ACEC is a few hundred visits a year, but includes car and RV camping, photography, and nature study.

Wilderness

The Chuckwalla Mountains Wilderness to the south and the Joshua Tree Wilderness to the west, north, and east are the Wilderness Areas closest to the proposed Project area. *Palen-McCoy Wilderness is farther away, approximately 10 miles to the east*. Project activities are not proposed within *any* Wilderness Area. In areas designated as a wilderness, use of motorized or mechanized vehicles or equipment is not permitted (except for authorized uses, but not by the public). These wilderness areas have no trails, facilities, or water and receive little recreation use. Though permitted, there is no record of hunting, fishing, or trapping in these areas. Short day hikes may occur, but backpacking or camping has not been observed or recorded. There are no trailheads, parking, or other access to the Joshua Tree Wilderness from the project site, or nearby. The Chuckwalla Wilderness is more accessible due to the Corn Springs Campground, which is surrounded by the wilderness.

Joshua Tree National Park Wilderness

The 594,502-acre Joshua Tree National Park Wilderness, which is administered by the National Park Service, is approximately 42 miles west of Blythe, California. Designated in 1976 by the Wilderness Act, the Joshua Tree Wilderness became part of Joshua Tree National Park in 1994 when the park (then a National Monument) was expanded and designated as a National Park by the California Desert Protection Act. This Wilderness Area is approximately 2.6 miles west, 3.6 miles north, and 1.6 miles east of the proposed Solar Farm site. It is at the southern end of the Coxcomb Mountains and contains arroyos, playas, bajadas, narrow ravines, and steep mountains. The steep terrain provides views to the south and west, which overlook the proposed Project. Some visitors are likely to access this area because of its proximity to Highway 177. In general, however, much of the park in this area is difficult to access because of the steep terrain and lack of trails.

This Wilderness Area is composed of two unique desert ecosystems. The Colorado Desert to the east is home to abundant creosote, the spidery ocotillo, and the jumping cholla cactus. The Mojave Desert covers the western area and is home to the wilderness namesake, the Joshua tree. Visitors to this wilderness seek desert experiences with opportunities for solitude and unconfined recreation. Area photography shows no trails or other established routes within this wilderness segment. (Visitor use and visitor preference data in the Wilderness Area are not available.) The area can be accessed three ways: (1) the west entrance is five miles south of the junction of State Highway 62 and Park Boulevard at Joshua Tree Village; (2) the north entrance is in the town of Twenty-Nine Palms; and 3) the south entrance is 20 miles east of Indio and approximately 27 miles west of Desert Center and can be approached from I-10.

Chuckwalla Mountains Wilderness

The Chuckwalla Mountains Wilderness is located approximately 40 miles west of Blythe, California, and covers 99,548 acres. This Wilderness Area is approximately six miles south of the Solar Farm site, 3,310 feet south of Red Bluff Substation A, and 2,890 feet south of Red Bluff Substation B. It was designated by the CDPA in 1994. It is composed of a variety of landforms, such as steep-walled canyons, inland valleys, large and small washes, isolated rock outcrops, and vast desert expanses. As a result, it provides habitat for a variety of plant and wildlife species, including bighorn sheep, burro deer, desert tortoise, ocotillo, and barrel and foxtail cactus. The area can be accessed by both the west and east from I-10.

Hunting, fishing, and non-commercial trapping are allowed under state and local laws. Pets and horses are permitted.

The Palen/McCoy Wilderness Area encompasses approximately 236,488 acres. Within it are the Granite, McCoy, Palen, Little Maria and Arica Mountains, which are five distinct mountain ranges separated by broad sloping bajadas. The diversity of vegetation and landforms is exceptional because this large area incorporates so many major geological features. The desert wash woodland found here provides food and cover for burro deer, coyote, bobcat, gray fox and mountain lion. Desert pavement, bajadas, interior valleys, canyons, dense ironwood forests, canyons and rugged peaks form a constantly changing landscape pattern. State Highway 62, near the Riverside County line provides access from the north, and I-10 via the Midland Road near Blythe provides access from the south. The area is accessible by four-wheel drive vehicles only. Mechanized or motorized vehicles are not permitted in a wilderness (CEC RSA, 2010). Wilderness users on the southern slopes would be within the viewshed of the proposed action (BLM 2010).

While the Joshua Tree National Park, Chuckwalla Mountains, and Palen-McCoy Wilderness Areas, are close to the proposed Project area, project activities are not proposed within these Wilderness Areas.

Lands with Wilderness Characteristics

All Public Lands within the CDD were analyzed and summarized in 1979 wilderness inventory decisions performed pursuant to the FLPMA. See *"California Desert Conservation Area - Wilderness Inventory –Final Descriptive– March 31, 1979"*. Public Land in the First Solar-Desert Sunlight (CACA 048649) project area is contained within CDCA Wilderness Inventory Units (WIU) #CDCA 332 and 333. The project area is also on Public Lands to the north and west that were too small to be identified as WIUs and so were not analyzed in the inventory.

WIU #CDCA 332 is bounded on the southeast by Highway 177, on the southwest by the Kaiser Mine Road and a power line, on the northwest by a transmission line and road associated with the Los Angeles Aqueduct and on the northeast by a road (which forms a portion of the boundary of Joshua Tree National Park). WIU #CDCA 333 is bounded on the east by Kaiser Mine Road, on the south by I-10, on the west by Eagle Mountain Road, and on the north by a transmission line and road associated with the Los Angeles Aqueduct. There is also Public Land north of WIUs 332 and 333 that were not in a WIU. They are bounded on the north by the Los Angeles Aqueduct, which is on non-federal lands. Roads fragment that area into at least three roadless areas. The acreage of two are approximately 4,000 and 600. The dominant feature of the WIUs and other lands is a southerly trending wash. Vegetation is sparse and primarily creosote. Most developments are on private lands. However, there are several rights of ways within the WIUs associated with the Los Angeles Aqueduct and the Kaiser Mine. The 1979 decision was that the imprints of man were substantially unnoticeable in WIU CDCA 332. It appears that the same decision was made for a portion of CDCA 333. However, neither WIU had outstanding opportunities for solitude or primitive and unconfined recreation and, therefore, it was determined that no wilderness characteristics are present in the area. As a result, no portions of these Public Lands were identified as a wilderness study area.

The Wilderness Inventory for the two WIUs was maintained pursuant to Section 201[a] of the FLPMA. Conditions existing in 2010 are essentially the same as in 1979. Several rights-of-ways have subsequently been issued, which may further degrade naturalness. In summary, no changes have occurred since 1979 that would warrant reversal of that 1979 decision that wilderness characteristics were not present in the area. Therefore, wilderness characteristics will not be analyzed further in this EIS.

3.15 TRANSPORTATION, TRAFFIC AND PUBLIC ACCESS

This section describes the environmental and regulatory settings associated with the construction and operation of the proposed Project or its alternatives with respect to transportation and public access in the Project Study Area.

3.15.1 Applicable Plans, Policies, and Regulations

California Desert Conservation Area Plan of 1980, as amended

The California Desert Conservation Area (CDCA) Plan provides a framework for land management decision-making for the BLM-administered lands in the California Desert District (CDD). First, land is assigned to one of four BLM Multiple Use Classes. Then, specific land management decisions are made as needed based on the uses and usage level appropriate for each class (BLM 1980). The CDCA Plan addresses vehicle travel and access across public lands as follows:

"The need for access across public lands to permit utilization of State and privately owned lands and to permit authorized developments on public lands, including mining claims, is recognized. The routes of travel and construction standards are subject to such BLM control as is required to prevent unnecessary or undue degradation of the public lands and their resources or to afford environmental protection (BLM 1980)."

"To engage in most desert recreational activities outside of open areas, visitors must use motorized vehicles and usually travel on some previously used or marked motorized-vehicle route. Understandably, vehicle access is among the most important recreation issues in the Desert. A primary consideration of the recreation program, therefore, is to ensure that access routes necessary for recreation enjoyment are provided. Specific route identification, as outlined in the Motorized-Vehicle Access Element, will be initiated upon adoption of this Plan (BLM 1980)."

Northern and Eastern Colorado Desert Coordinated Management Plan (2002)

The Northern and Eastern Colorado Desert Coordinated Management Plan (NECO Plan) is one of six amendments to the CDCA Plan and is discussed in more detail in Chapter 2.

Federal Aviation Administration Regulations (14 CFR 77)

Title 14 CFR Section 77 contains standards for determining physical obstructions to navigable airspace. Form 7460-1, Notice of Proposed Construction or Alteration, must be filed with the Federal Aviation Administration (FAA) if an object to be constructed has the potential to affect navigable airspace according to these standards.

Federal Transportation Regulations (49 CFR, Subtitle B)

Title 49 CFR, Subtitle B, contains procedures and regulations pertaining to interstate and intrastate transport, including hazardous materials program procedures, and provides safety measures for motor carriers and motor vehicles that operate on public highways.

California Vehicle Code

The California Vehicle Code contains regulations applicable to roadway damage; licensing, size, weight, and load of vehicles operated on highways; safe operation of vehicles; and the transportation of hazardous materials.

California Streets and Highways Code

The California Streets and Highways Code specifies that permits issued by the California Department of Transportation (Caltrans) be required for any roadway encroachment during truck transportation and delivery, as well as for any load that exceeds Caltrans's weight, length, or width standards for public roadways.

County of Riverside General Plan and Desert Center Area Plan

The policies of the Desert Center Area Plan (DCAP; Riverside County 2003) were developed for the Desert Center area in accordance with the vision and policies of the County of Riverside General Plan (Riverside County 2003). The DCAP contains specific policies related to the vehicular circulation system, airports, and scenic highways that are relevant to this Project.

County of Riverside Congestion Management Plan

Riverside County's Congestion Management Plan (CMP) specifies that all CMP roadways operate at a Level of Service of "E" or better. All state highways and principal arterials are CMP roadways. I-10 and SR-177 are the only CMP roadways in the Project area.

3.15.2 Existing Conditions

This section provides a discussion of the transportation system in the vicinity of the proposed Project. The section includes a discussion of roads, traffic, airports, railways, bicycle facilities, and public transportation.

Roads and Intersections

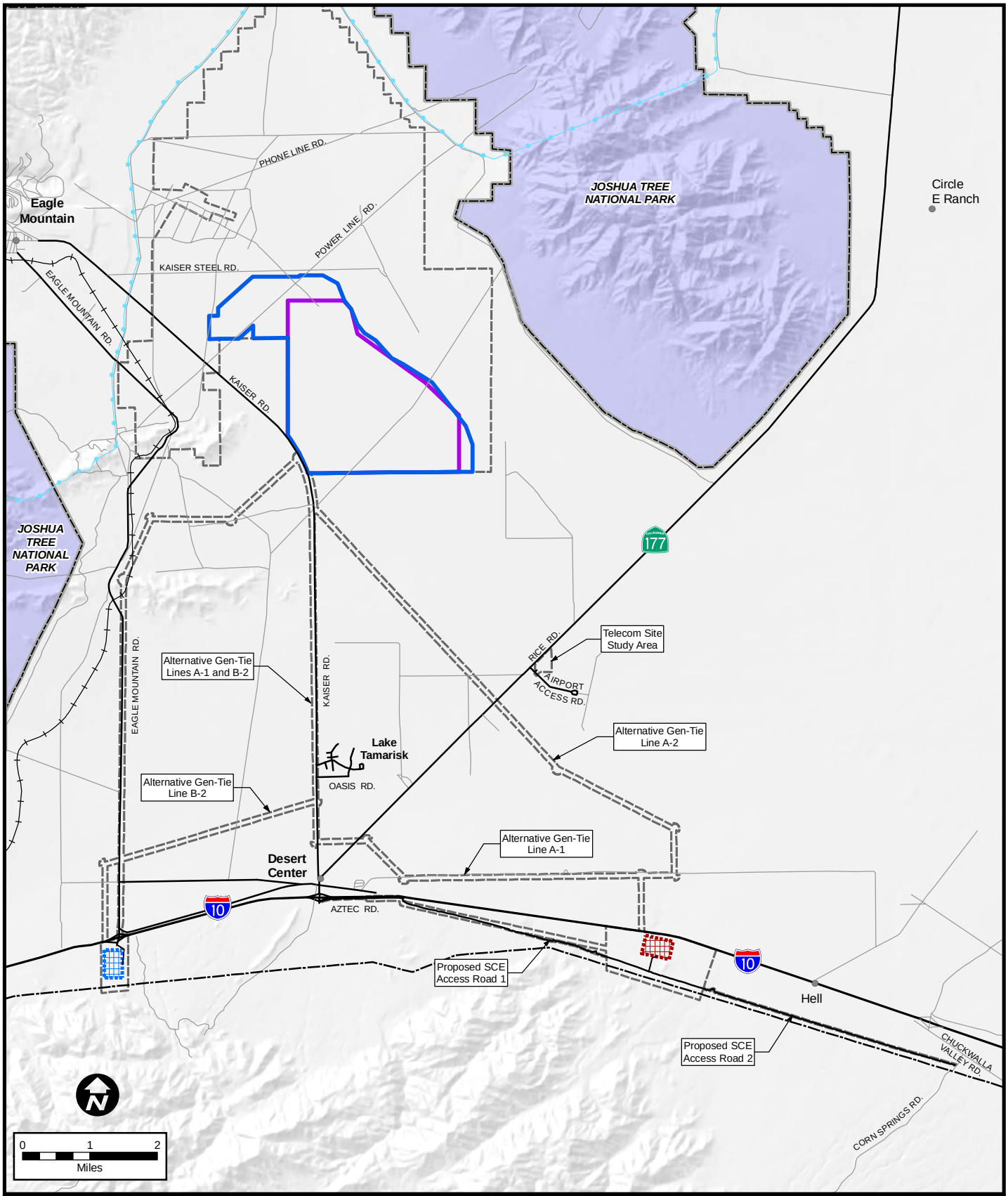
Roads in the Project vicinity are limited due to the remoteness and lack of development in the area. The primary roads in the vicinity of the proposed Project are shown in Figure 3.15-1, summarized in Table 3.15-1 and described below.

Table 3.15-1
Roads in the Project Area

Road	General Direction	Condition	Jurisdiction
I-10	East-west	Major road	Caltrans
SR-177	Northeast-southwest	Major road	Riverside County
Kaiser Road	North-south	Major road	Riverside County
Eagle Mountain Road	North-south	Minor Road	Riverside County
Power Line Road	Northeast-southwest	Maintained dirt	Riverside County
Phone Line Road	North-south/east-west	Maintained dirt	Riverside County
Kaiser Steel Road	East-west	Unmaintained dirt	Private
Aztec Avenue	East-west	Minor road	Riverside County
Airport Access Road	East-west	Maintained dirt	Private
Corn Springs Road	Northeast-southwest	Maintained dirt	BLM
Chuckwalla Valley Road	Northwest-southeast	Minor road	Riverside County

Source: First Solar 2009

X:\GIS\Desert_Sunlight\MXD_Files\Roads.mxd



LEGEND

- Eagle Mountain Railroad
- Desert Sunlight Study Area Boundary
- Solar Farm Boundary (Alternative B)
- Solar Farm Boundary (Alternative C)
- Red Bluff Substation (Alternative A)
- Red Bluff Substation (Alternative B)
- Devers-Palo Verde Transmission Line (DPV1)
- Aqueduct

Source: Tele Atlas North Ameica, Inc., ESRI 2009.

DESERT SUNLIGHT SOLAR FARM

Figure 3.15-1

Existing Roads

Interstate 10 (I-10)

I-10 is an east-west interstate with a western terminus in Santa Monica, California, and an eastern terminus in Jacksonville, Florida. In the vicinity of the proposed Project it has two lanes of travel in each direction (HKA 2010).

State Route 177 (SR-177)

SR-177 is a predominantly north-south road that provides access from Kaiser Road to I-10. It is also known as Desert Center Rice Road, although it will be referred to as SR-177 in this EIS. In the vicinity of the proposed Project it is paved with centerline and edge of pavement markings, and has one lane of travel in each direction.

Kaiser Road

Kaiser Road would be the primary road to provide access to the proposed Project. It is paved, has one lane of travel in each direction and a centerline stripe. It is a predominantly north-south road with a southern terminus at SR-177 in Desert Center and a northern terminus at the Eagle Mountain Mine. The road is primarily traveled by local residents (HKA 2010).

Aztec Avenue

Aztec Avenue is an east-west road with a western terminus at SR-177 that runs along the southern frontage of I-10 from approximately one mile, where it intersects an unimproved pipeline patrol road. A 6,000-foot section of Aztec Avenue would provide access to the proposed Red Bluff Substation A for Alternative 1, along with approximately 20,000 feet of a pipeline patrol road. Aztec Avenue is paved, but the pipeline patrol road is not.

Airport Access Road

This road provides access to the former Desert Center Airport (now a private special-use airport) from SR-177.

Corn Springs Road

Corn Springs Road is an unpaved northeast-southwest road with a northern terminus at Chuckwalla Valley Road and a southern terminus in undeveloped BLM-administered land approximately five miles south of Desert Center. A 300-foot section of Corn Springs Road would provide access to the proposed Red Bluff Substation A for Alternative 3, along with approximately 24,000 feet of an unpaved pipeline patrol road.

Chuckwalla Valley Road

Chuckwalla Valley Road is a paved road accessed from I-10 approximately nine miles east of Desert Center. A 3,200-foot section of Chuckwalla Valley Road between I-10 and Corn Springs Road would provide access to the proposed Red Bluff Substation A for Alternative 3, along with approximately 24,000 feet of an unpaved pipeline patrol road.

Eagle Mountain Road

Eagle Mountain Road is primarily a north-south road with a southern terminus just south of I-10 and the Eagle Mountain exit and a northern terminus at the Eagle Mountain townsite. Eagle

Mountain Road would be extended 300 feet to the south of I-10 to become the primary road to provide access to the proposed Red Bluff Substation B. It is paved and has one lane of travel in each direction.

Power Line Road

Power Line Road is a maintained dirt road that runs northeast-southwest and connects with Kaiser Road. The road parallels Metropolitan Water District of Southern California (MWD) transmission and distribution lines. *Off-highway vehicles (*OHVs*)* are allowed on this road; OHVs are discussed in Section 3.12, Recreation.

Phone Line Road

Phone Line Road is a maintained dirt road that intersects Power Line Road near Eagle Mountain Road, runs north-south, and then turns northeast at the Eagle Mountain townsite. OHVs are allowed on this road; see Section 3.12, Recreation.

Kaiser Steel Road

Kaiser Steel Road is a private east-west unmaintained dirt road owned by Kaiser Ventures. The road parallels an existing Kaiser Ventures distribution line and is used to access two water wells east of the Solar Farm site. OHVs are allowed on this road west of the intersection with Power Line Road (see Section 3.12, Recreation). The road is closed east of the intersection with Power Line Road for ecological preservation (First Solar 2009).

Other Roads

Several smaller unpaved and unmaintained local roads or routes have been documented in the project vicinity and are shown on Figure 3.15-1.

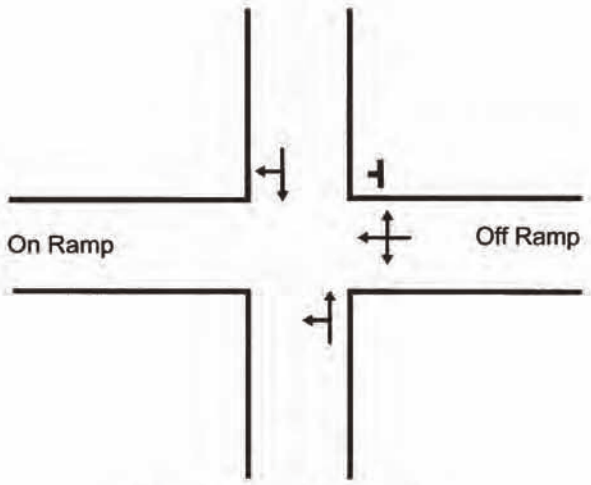
Intersections

The following intersections are the primary intersections that would be traversed by construction traffic associated with the proposed Project:

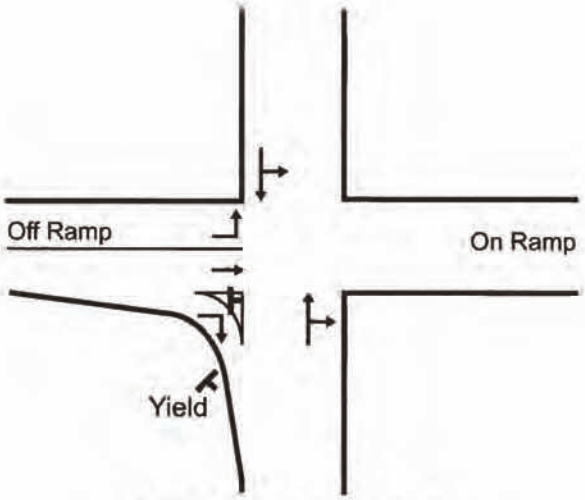
- SR-177 and the I-10 eastbound off-ramp;
- SR-177 and the I-10 westbound off-ramp; and
- SR-177 and Kaiser Road.

The geometry of the intersections is shown in Figure 3.15-2. Turning movements at these intersections are controlled by stop or yield signs, as appropriate. None of the intersections are signalized. Existing traffic at these intersections is shown in Figure 3.15-3, which shows the AM peak-hour traffic volume, and Figure 3.15-4, which shows the PM peak-hour traffic volumes (HKA 2010).

X:\DESERT SUNLIGHT\CORELDRAW\INTER_GEOMETRY 2.CDR



I-10 WEST BOUND (E-W)
and
STATE ROUTE 177 (N-S)



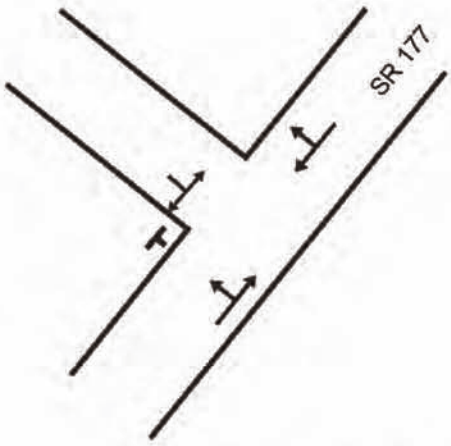
I-10 EASTBOUND (E-W)
AND
STATE ROUTE 177 (N-S)

NORTH
N.T.S.

Legend

Direction of Traffic

Stop Sign



KAISER ROAD (NW-SE)
AND
STATE ROUTE 177 (NE-SW)

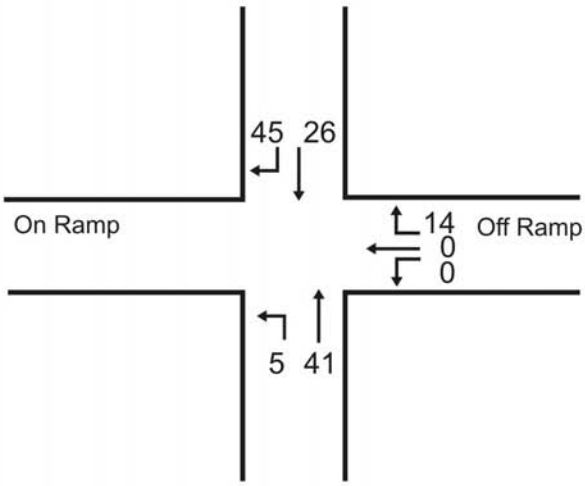
Source: Hernandez, Kroone & Associates, 2010.

DESERT SUNLIGHT SOLAR FARM

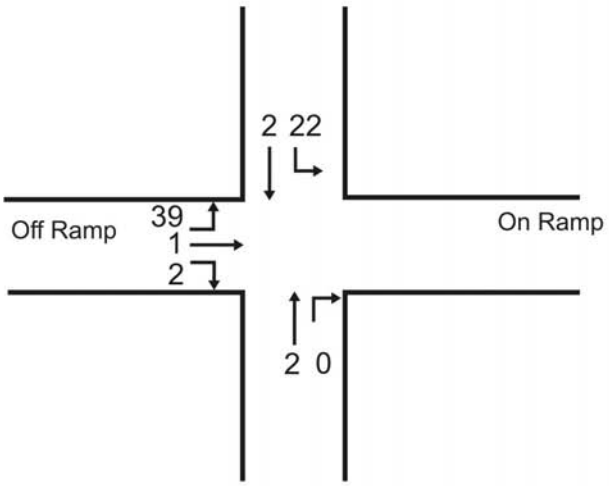
Figure 3.15-2

Intersection Geometry

X:\DESERT SUNLIGHT\EX_TRAFFIC_AM.CDR

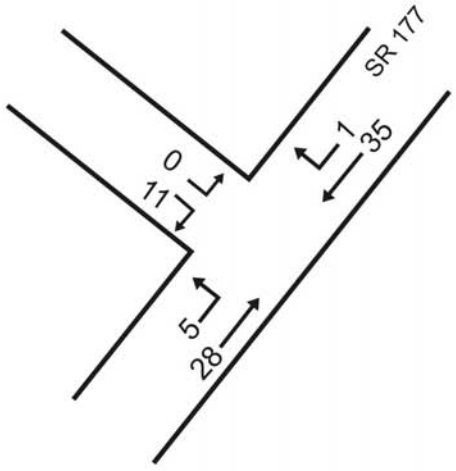


I-10 WEST BOUND (E-W)
and
STATE ROUTE 177 (N-S)



I-10 EASTBOUND (E-W)
AND
STATE ROUTE 177 (N-S)

NORTH
N.T.S.



KAISER ROAD (NW-SE)
AND
STATE ROUTE 177 (NE-SW)

Note: The numbers shown are the number of vehicles that moved through the intersection as indicated (turning left, going straight, or turning right) during the AM Peak Period, which is 7:00 am to 9:00 am.

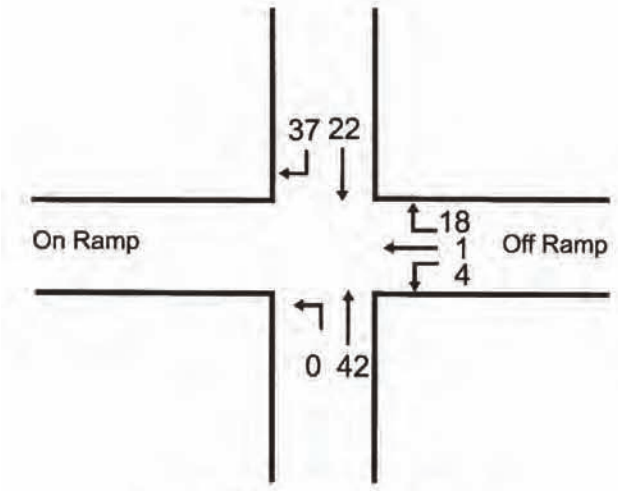
Source: Hernandez, Kroone & Associates, Inc. 2010.

DESERT SUNLIGHT SOLAR FARM

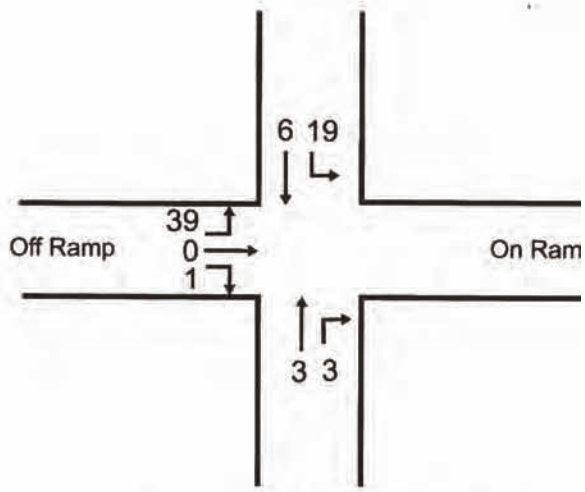
Figure 3.15-3

Existing Intersection Traffic - AM Peak Period

X:\DESERT SUNLIGHT\CORELDRAW\EX_TRAFFIC_PM.CDR

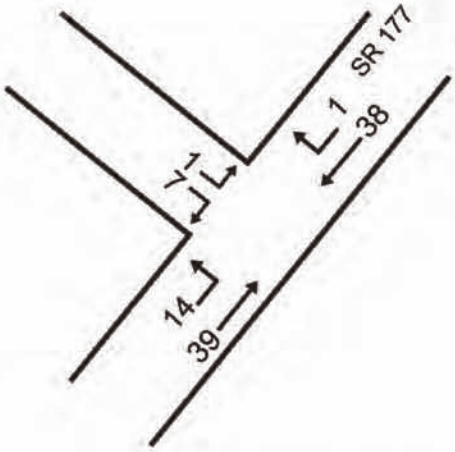


I-10 WEST BOUND (E-W)
and
STATE ROUTE 177 (N-S)



I-10 EASTBOUND (E-W)
AND
STATE ROUTE 177 (N-S)

NORTH
N.T.S.



KAISER ROAD (NW-SE)
AND
STATE ROUTE 177 (NE-SW)

Note: The numbers shown are the number of vehicles that moved through the intersection as indicated (turning left, going straight, or turning right) during the PM Peak Period, which is 4:00 pm to 6:00 pm.

Source: Hernandez, Kroone & Associates, Inc. 2010.

DESERT SUNLIGHT SOLAR FARM

Figure 3.15-4

Existing Intersection Traffic - PM Peak Period

Photographs of some of the roads and intersections in the project vicinity are included as Figures 3.15-5 through 3.15-8.

Figure 3.15-5 Photograph at the Intersection of SR 177 and Kaiser Road Looking Southeast

Figure 3.15-6 Photograph of Kaiser Road One Mile North of SR 177 Looking North

Figure 3.15-7 Photograph of Kaiser Road at the Proposed Project Location Looking North

Figure 3.15-8 Photograph at the Intersection of SR 177 and the I-10 Eastbound Off-Ramp Looking Northwest

Existing Traffic Volumes

A traffic study was conducted by Hernandez, Kroone, and Associates (HKA). The study included traffic counts by Counts Unlimited, Inc., on February 17, 2010, at four locations:

- The intersection of SR-177 and I-10 eastbound;
- The intersection of SR-177 and I-10 westbound;
- The intersection of SR-177 and Kaiser Road; and
- Kaiser Road north of Lake Tamarisk Resort.

Intersection Traffic Volume

Vehicle turning movements were counted at the three intersections during the two-hour peak period in the morning (7:00 AM to 9:00 AM) and in the afternoon (4:00 PM to 6:00 PM). The relevant analysis period is the hour when the highest volume of traffic occurs. The total number of vehicles passing through each intersection during the AM and PM peak hours is presented in Table 3.15-2.

Table 3.15-2
Peak Hour Traffic Counts

Intersection	Total Vehicles during AM Peak Hour	Total Vehicles during PM Peak Hour
SR-177 and I-10 Eastbound	68	71
SR-177 and I-10 Westbound	131	124
SR-177 and Kaiser Road	80	100

Source: HKA 2010

Roadway Segment Traffic Volume

Total traffic was counted and classified by vehicle type over a 24-hour period on Kaiser Road north of Lake Tamarisk Resort. A total of 108 vehicles were counted, 101 of which were cars, trailers or other two-axle vehicles and seven of which had three or more axles (HKA 2010).

Traffic count data for I-10 and SR-177 were obtained from Caltrans. The average daily traffic (ADT) volume on I-10 near the SR-177 interchange is between 21,400 and 23,000 vehicles, with between 2,800 and 3,000 vehicles during the peak hour (Caltrans 2009). The ADT volume on SR-177 near the I-10 interchange is about 3,700 vehicles, with about 490 vehicles during the peak hour (Caltrans 2009).

Existing Level of Service

The perceived operating level of an intersection or roadway segment can be described using the term "Level of Service" (LOS). LOS is generally described in terms of travel time and speed, freedom to maneuver, traffic interruptions, comfort, and convenience. The LOS applies quantifiable traffic measurements, such as intersection delays, to provide a qualitative assessment of motorists' perception of and satisfaction with traffic conditions. LOS is designated by the letters "A" through "F" with "A" for most favorable and "F" for least favorable, with each letter representing a range of conditions. For unsignalized intersections, LOS is reported for the vehicle movement controlled by

a stop or yield sign (i.e., LOS is not reported for the intersection as a whole, or for vehicles that do not have to stop). LOS definitions for unsignalized intersections are provided in Table 3.15-3.

Table 3.15-3
Definition of Level of Service for Unsignalized Intersections

LOS	Qualitative Delay	Quantitative Delay (seconds/vehicle)
A	Little or no delay	≤ 10
B	Short traffic delays	> 10 and ≤ 15
C	Average traffic delays	> 15 and ≤ 25
D	Long traffic delays	> 25 and ≤ 35
E	Very long traffic delays	> 35 and ≤ 50
F	Extreme delays potentially affecting other traffic movements in the intersection	> 50

Source: Transportation Research Board 2000

The LOS of the intersections analyzed in the traffic study and the delay in seconds upon which the LOS calculation is based are presented in Table 3.15-4.

Table 3.15-4
Existing Level of Service and Delay at Project Intersections

Intersection	LOS during AM Peak Hour	Delay during AM Peak Hour (seconds)	LOS during PM Peak Hour	Delay during PM Peak Hour (seconds)
SR-177 and I-10 Eastbound	A	9.0	A	8.9
SR-177 and I-10 Westbound	A	8.6	A	8.7
SR-177 and Kaiser Road	A	8.5	A	8.6

Source: HKA 2010

The DCAP includes the following policy regarding LOS:

> "DCAP 6.2 Maintain the County's roadway Level of Service standards as described in the Level of Service section of the General Plan Circulation Element" (Riverside County 2003).

LOS "C" or better is the County standard according to the Riverside County General Plan Circulation Element. LOS "D" or "E" may be acceptable on some types of roads when special circumstances exist (Riverside County 2003).

Airports and Airspace

There are no airports within the Project Study Area. A landing strip owned by Kaiser Industries and associated with Eagle Mountain is approximately 0.5 mile west of the Solar Farm area (Eagle Crest Energy Company 2008). It was not listed in a database of airports in the US and is assumed to see little, if any, traffic (AirNav 2010).

The Desert Center Airport (FAA Identifier L64) was previously located approximately five miles northeast of Desert Center, California, south of SR-177. It was a public general aviation airport that saw little traffic. In 2004, approximately 150 aircraft operations (take-offs and landings) took place at the airport.

Recently, Riverside County sold the airport to a private firm, Chuckwalla Valley Associates, LLC. The 4,200-foot airport runway continues to operate as a private special-use airport (and includes a racetrack). The 4,200-foot runway is surrounded by an influence area that extends approximately 1,750 feet from the runway in all directions (County of Riverside Planning Department Staff Report 2009).

The DCAP includes the following policy, which may require amendment due to the recent conversion of the airport from a public airport to a private special-use airport:

> "DCAP 3.1 To provide for the orderly development of Desert Center Airport and the surrounding area, comply with the Airport Land Use Compatibility Plan for Desert Center Airport as fully set forth in Appendix L and as summarized in Table 4, as well as any applicable policies related to airports in the Land Use, Circulation, Safety and Noise Elements of the Riverside County General Plan" (Riverside County 2003).

The private-use airport zone of influence area and Eagle Mountain landing strip are shown on Figure 3.9-3 in the Lands and Realty section.

The nearest public airport is the Chiriaco Summit Airport, which is approximately 18 miles west of the Project area, along I-10.

The Project would overlap several low-level military flight paths (State of California 2000). All of the Project components for Alternatives 1, 2, and 3 would overlap a Department of Defense area where consultation with the military is required to ensure that construction does not interfere with low-level flight operations (BLM and USFS 2010).

Railways

There are no railways within the Project Study Area. The nearest railway is the Eagle Mountain railroad, which runs north from I-10 to Eagle Mountain as shown in Figure 3.15-1. The railroad will likely be used in the future to transport nonhazardous solid waste to the *proposed* Eagle Mountain Landfill (Riverside County 2003).

Bicycle Routes

There are no bicycle routes or facilities such as designated bicycle lanes on the roads discussed in this section (Riverside County 2003). No bicycles were observed during the traffic counts on February 17, 2010 (HKA 2010); however, it is likely that cyclists use area roads infrequently.

Public Transportation

Greyhound Bus service and potentially other commercial bus lines provide public transportation eastbound and westbound on I-10. There is no public transportation in Desert Center, on SR-177, or on Kaiser Road (HKA 2010; Riverside County 2003).

Public Access

Public access refers to the legal rights of citizens to access public land for certain purposes without barriers or impediments. The affected environment related to public access includes recreational use of land by the public as well as other legal guarantees or limitations on access such as deeds, right-of-way, easements, leases, licenses, and permits.

The majority of the Project Study Area is remote, vacant, and undeveloped with few apparent uses by the public. A review of 2010 aerial photographs revealed no obvious evidence of public use or land development within the Project Study Area other than a small number of roads and transmission lines (Google Earth 2010). The roads in the Project Study Area have been previously discussed in this section and are shown on Figure 3.15-1. The transmission and distribution lines are discussed in Section 3.9 (Lands and Realty) and shown on Figure 3.9-5.

3.16 VISUAL RESOURCES

Visual resources refer to the natural and man-made, moving and stationary physical features that compose the character of the landscape as visually observed from a given location. The physical features (e.g., landforms, water bodies, animals, vegetation, and structures) that are visible on a landscape contribute to the scenery, visual quality, and visual appeal of the landscape.

The region of influence (ROI) (or geographic extent that is being evaluated) for visual resources is defined as the viewshed, an area seen from a particular location to the visible horizon. Delineation of the viewshed from the proposed Project location must extend from the top elevation of all of the proposed facilities rising at the Project location, expanded to 5.5 feet above the ground of the visible horizon. Mountains surrounding the proposed Project site limit the viewshed to generally less than 15 miles from the proposed Project to mountain ridgelines. Consequently, the ROI is mostly bounded by ridgelines (of the Eagle Mountains, Coxcomb Mountains, and Chuckwalla Mountains), except on the southeast and a small area on the southwest. A description of the visual resources in the ROI follows the discussion of applicable plans, policies, and regulations below.

A scenic vista is a distant view of a broad area that is visually or aesthetically pleasing, typically because of the mostly undeveloped landscape being viewed. Although there are no designated scenic vistas, general scenic vistas across the landscape are still available. Most scenic vistas involving the Project site are from viewpoints along I-10, along SR-177, and in Desert Center and Lake Tamarisk.

The visual character and quality of a site and its surroundings are the combination of visual resources in a specific area that contribute to the overall local setting. The areal extent of scenic vistas is greater than that of the local setting, which includes only the readily visible surrounding area. However, both are still composed of natural and man-made, moving and stationary physical features.

3.16.1 Applicable Plans, Policies, and Regulations

California Desert Conservation Area

Covering more than 25 million acres, the geologically diverse California Desert Conservation Area (CDCA) includes sand dunes, canyons, dry lakes, mountain ranges, and wilderness areas. The Project area is within the CDCA, which was established, in part, to protect the area's scenic resources that are located adjacent to a population center. The BLM manages approximately 12 million acres in the CDCA. The CDCA Plan did not include BLM Visual Resource Management (VRM) classes. However, a BLM-authorized visual resource inventory (VRI) was conducted in 2010 and includes the Project area. It is described below under Existing Conditions.

In the CDCA Plan, the location of the proposed Project includes land that is mostly classified as Multiple-Use Class (MUC) M (Moderate Use) and some classified as Multiple-Use Class L (Limited Use). The BLM's CDCA Plan defines the classes as follows:

- Class L (Limited Use)—These lands are managed to protect sensitive, natural, scenic, ecological, and cultural resource values. They provide for generally lower-intensity, carefully controlled multiple uses that do not significantly diminish resource values.

- Class M (Moderate Use)—These lands are managed in a controlled balance between higher-intensity use and protection. A wide variety of uses such as mining, livestock grazing, recreation, energy, and the development of new utility facilities are allowed.

Federal Land Policy and Management Act

The Federal Land Policy and Management Act (FLPMA) mandates protection of scenic values. In order to meet its responsibility to maintain the scenic values of public lands, BLM developed a VRM system. BLM's VRM policy is set forth in Manual 8400-1 (BLM 1984), with guidance provided in handbooks H-8410-1 Visual Resource Inventory (BLM 1986a) and H-8431-1 Visual Resource Contrast Rating (BLM 1986b). Additional guidance is contained in BLM Washington Office Instruction Memorandum 2009-167, Application of the Visual Resource Management Program to Renewable Energy.

FLPMA requires coordination with local planning (Title II, Sec. 202 (b)(9)). Portions of projects on private land are subject to local planning.

Visual Resource Management System

The objective of the VRM system is to manage public lands in a manner that will protect the quality of the scenic values of these lands. The VRM system consists of three stages: VRI, designation of VRM classes during the land use planning or plan amendment process, and visual resource contrast rating.

Visual Resource Inventory

The inventory stage involves identifying the visual resources of an area and assigning them to inventory classes using the BLM's VRI process. The process involves rating the visual appeal of a tract of land, measuring public concern for scenic quality, and determining whether the tract of land is visible from travel routes or observation points. The process is described in detail in Handbook H-8410-1, Visual Resource Inventory.

Visual Resource Management Objectives

Visual resource management objectives are established in resource management plans (RMPs). Visual resource management decisions consider visual values established by the inventory along with land use allocations, desired outcomes, and future desired conditions. The management classes may differ from inventory classes, based on management priorities for land uses and compatibility with land use allocations. A description of the classes is provided in Table 3.16-1.

For the Project area, the VRM objectives have not been established. Interim visual management classes are established where a project is proposed and there are no RMP-approved VRM objectives. These classes are developed using the VRI process and must conform to the land use allocations set forth in the RMP covering the project area.

The interim objectives serve as the baseline for plan conformance, while the underlying VRI remains the baseline for determining actual physical impacts on the visual resources of the area.

Table 3.16-1
Bureau of Land Management Visual Resource Class Descriptions

Class	Description
I	Objective: Preserve landscape character. This class provides for natural ecological changes but does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
II	Objective: Retain existing landscape character. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract a casual observer's attention. Any changes must repeat the basic elements of line, form, color, and texture found in the predominant natural features of the characteristic landscape.
III	Objective: Partially retain existing landscape character. The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but should not dominate a casual observer's view. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
IV	Objective: Provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.

Source: BLM 1986a

Visual Contrast Rating

Proposed plans of development are evaluated for conformance to the VRM class objectives through the use of the visual resource contrast rating process set forth within BLM Handbook H-8431-1, Visual Resource Contrast Rating. Because this concerns the environmental consequences of the proposed project, this process is further described and applied in Section 4.16, Visual Resources.

Scenic Roadway Programs

After a review of applicable planning and management documents, no officially designated or eligible California Department of Transportation state scenic highways were identified in the ROI. Although there are no state-designated or state-eligible scenic highways, there is a county-eligible scenic highway in the ROI. I-10, a Riverside County-eligible scenic highway, runs past the Desert Center area, affording views of the contrasting desert and mountainous terrain (LSA Associates, Inc. 2000). The stark contrast between sparsely vegetated desert flat lands and rocky mountainous terrain is pronounced in the Desert Center area. The visual landscape seen from I-10 in the vicinity of Desert Center is described further below under Existing Conditions.

Riverside County General Plan

The Riverside County General Plan's Land Use (LU) Element contains the following policies involving visual resources that are applicable to the ROI (Riverside County 2003):

- LU 4.1 requires that new developments be located and designed to visually enhance, not degrade the character of the surrounding area. Consideration should be given to preserving natural features, such as unique natural terrain, drainage ways, and native vegetation, wherever possible, particularly where they provide continuity with more extensive regional systems.

- LU 13.1 preserves and protects outstanding scenic vistas and visual features for the enjoyment of the traveling public.
- LU 13.3 ensures that the design and appearance of new landscaping, structures, equipment, signs, or grading within designated and eligible state and county scenic highway corridors are compatible with the surrounding scenic setting or environment.
- LU 13.5 requires new or relocated electric or communication distribution lines, which would be visible from designated and eligible state and county scenic highways, to be placed underground.
- LU 13.8 seeks to avoid the blocking of public views by solid walls.
- LU 20.1 requires that structures be designed to maintain the environmental character in which they are located.
- LU 20.2 requires that development be designed to blend with undeveloped natural contours of the site and avoid an unvaried, unnatural, or manufactured appearance.
- LU 20.4 ensures that development does not adversely impact the open space and rural character of the surrounding area.

The Desert Center Area Plan (DCAP) contains the following policies involving visual resources that are applicable to the ROI (Riverside County 2003):

- DCAP 2.3 assures that the design of new land uses subject to discretionary review visually enhances, and does not degrade, the character of the Desert Center region.
- DCAP 5.1 requires that outdoor lighting use fixtures that minimize effects on the nighttime sky and wildlife habitat areas, except as necessary for security reasons.
- DCAP 9.1 protects the scenic highways within the DCAP from change that would diminish the aesthetic value of adjacent properties through adherence to the policies found in the Scenic Corridors sections of the General Plan Land Use, Multipurpose Open Space, and Circulation Elements.
- DCAP 9.2 supports the designation of I-10 as an eligible and, subsequently, official scenic highway, in accordance with the California State Scenic Highway Program.
- DCAP 10.1 encourages clustering of development for the preservation of contiguous open space.

3.16.2 Existing Conditions

Inventory

In 2010, the BLM conducted a VRI to characterize the visual resources on the lands it manages (Otak 2010). The VRI process provides BLM managers with a means for determining visual values. The inventory consists of a scenic quality evaluation, sensitivity level analysis, and delineation of distance zones. Based on these three factors, BLM-administered lands are placed into one of four VRI classes. These inventory classes represent the relative value of the visual resources.

Scenic quality is a measure of the visual appeal of a tract of land. In the VRI process, public lands are given an A, B, or C rating based on the apparent scenic quality, which is determined using seven

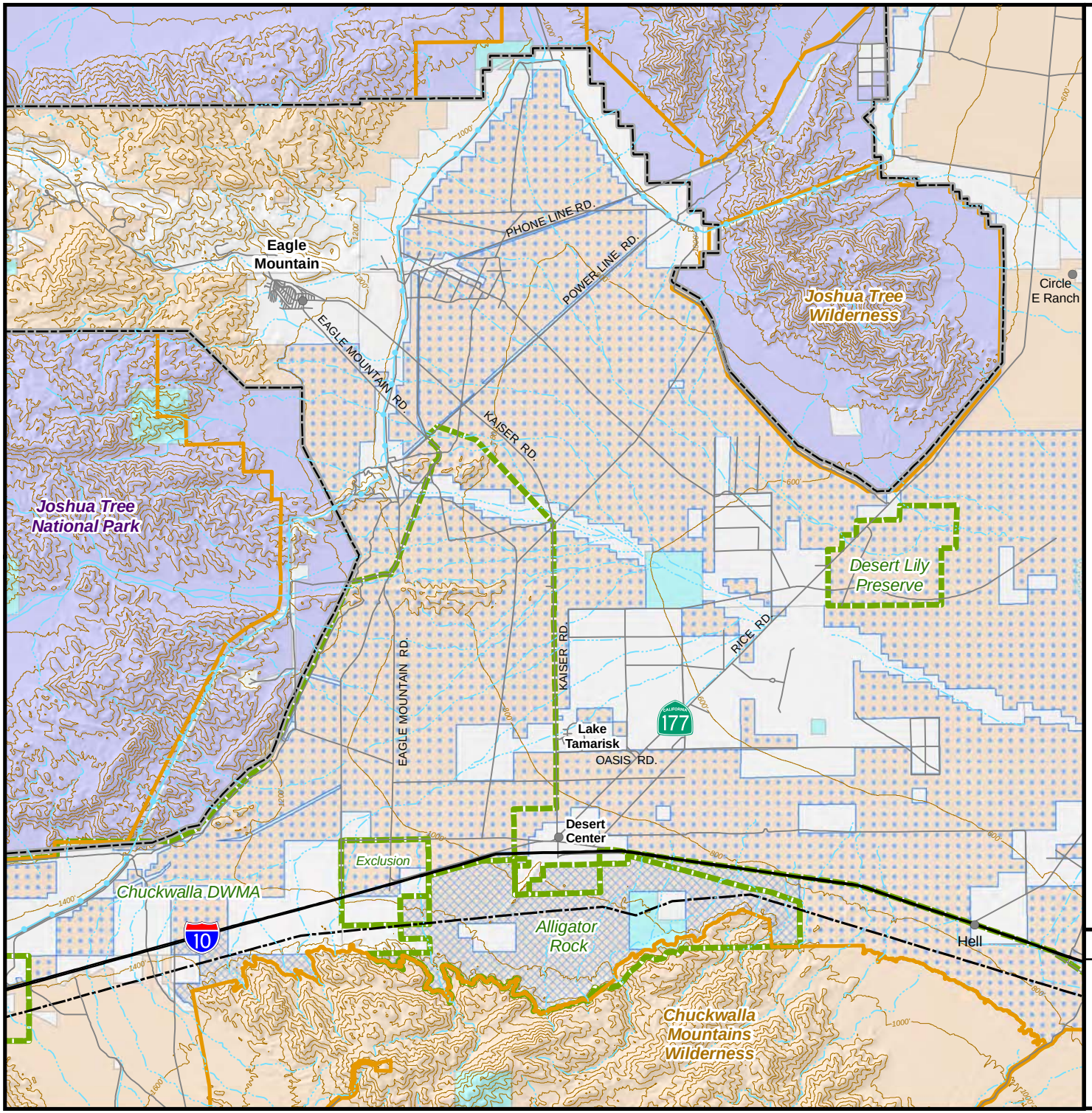
key factors: landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. According to the VRI, the scenic quality of the Chuckwalla Valley is characterized by a vast, low, gently rolling valley bottom; some variety of vegetation (one or two major types); no water, subtle color variation and some color contrast in soil and vegetation; dramatic mountains surrounding the area; a fairly distinctive but not unusual environment; and some cultural modification but overall natural appearance. As a result, the area of the Project received a low B scenic quality rating because it received low scores for landform and water; low/medium scores for color and scarcity; medium scores for vegetation and cultural modifications; and a medium/high score for adjacent scenery.

Sensitivity levels are a measure of public concern for scenic quality. Public lands are assigned high, medium, or low sensitivity levels by analyzing the various indicators of public concern. Factors considered in a sensitivity level analysis include type of users, amount of use, public interest, adjacent land uses, special areas, and any other factors that include visual sensitivity issues. According to the VRI, the sensitivity level of the Chuckwalla Valley is characterized by modest recreational use, energy corridors, and private land development; high volumes of traffic on I-10 and low amounts of traffic on secondary and BLM roads; public interest and special sensitivity associated with the CDCA; being surrounded by special areas (a National Park and BLM wilderness); and the presence of development. As a result, the area of the Project received an overall medium sensitivity level rating because it received low scores for type of use and other factors; medium scores for amount of use, public interest, adjacent land uses, and special areas; and no high scores.

Landscapes are subdivided into three distance zones based on relative visibility from travel routes or observation points. The three zones are foreground-middleground, background, and seldom seen. The foreground-middleground zone includes areas seen from highways, rivers, or other viewing locations that are less than three to five miles away. Areas beyond the foreground-middleground zone, but usually less than 15 miles away, are in the background zone. Areas not seen as foreground-middleground or background (i.e., hidden from view) are in the seldom-seen zone. Distance zones are determined in the field by actually traveling along each route and observing the area that can be viewed. The Project area is in the foreground-middleground distance zone for most viewer groups, which are described below under Setting. However, for the limited recreational users in the surrounding wilderness areas, the Project area could be in the background to seldom-seen distance zones, depending on the exact location of the recreational users in the surrounding wilderness areas.

Based on the combination of the scenic quality, sensitivity levels, and distance zones, the Project area received VRI Class II and III designations. The scenic quality, sensitivity levels, and distance zones are further described below under Setting.

The VRI classes, along with the MUCs, are used to determine interim visual management class designations. Both Solar Farm alternatives, most of GT-A-1 and GT-A-2, and segments of GT-B-2 would be on land designated MUC M. Most of GT-B-2 and Red Bluff Substation A would be on land designated MUC L. Red Bluff Substation B would be on private land. A wide variety of uses such as mining, livestock grazing, recreation, energy, and the development of new utility facilities are allowed under MUC M. MUC L provides for generally lower-intensity, carefully controlled multiple uses that do not significantly diminish resource values. As a result, the BLM land north of I-10 is assigned an interim visual management Class III designation, and the BLM land south of I-10 is assigned an interim visual management Class II designation due to its connection to the Alligator Rock Area of Special Environmental Concern and proximity to BLM wilderness (Figure 3.16-1).



X:\GIS\Desert_Sunlight\MXD_Files\VRC_IVb.mxd

0 3 Miles

LEGEND

- BLM Managed Lands in Class II
- BLM Managed Lands in Class III
- Primary Highway / Interstate
- Secondary Road
- Unimproved Road
- Aqueduct
- Perennial Water Course
- Intermittent Water Course
- Devers-Palo Verde Transmission Line (DPV1)
- Topographic Elevation Contour (200' interval)
- Intermittent Water Feature
- Joshua Tree National Park Boundary
- BLM Wilderness Area
- Area of Critical Environmental Concern (ACEC)

Land Ownership / Management

- Bureau of Land Management
- National Park Service
- Private/Unclassified
- State

DESERT SUNLIGHT SOLAR FARM

Figure 3.16-1

Interim Visual Management Classes

The interim visual management classes are only for analysis of the proposed Project. The establishment of interim management classes will not require an RMP amendment, unless the project that is driving the evaluation requires one.

Setting

The Chuckwalla Valley is a broad, flat desert plain that includes scattered dry lakes and rolling sand dunes. It is bordered by a number of rugged mountain ranges. Mountains offer dramatic relief to the landscape and contain more diverse vegetation. The mountains can be more than 1,000 feet higher than the valley floor. The ROI is mostly bounded by ridgelines of the Eagle Mountains, Coxcomb Mountains, and Chuckwalla Mountains, except on the southeast and a small area on the southwest. The Joshua Tree Wilderness Area and Chuckwalla Mountains Wilderness Area are in these mountains.

Viewer groups of the ROI include dispersed recreational users in the surrounding mountains and the valley floor, nearby residents in Lake Tamarisk and dispersed private land, visitor-serving businesses in Desert Center, and roadway traffic on Kaiser Road, SR-177, and I-10. The majority of views of the proposed Project are from Lake Tamarisk and along I-10 on the valley floor. Views of the Project area from the valley floor are fairly horizontal due to the relatively flat valley floor. A higher angle of view of the Project area is available from the surrounding mountains and wilderness areas. Although limited by access and lack of trails or facilities, some hikers or other visitors may view the project site from the surrounding mountains. Use of the surrounding mountains by dispersed recreational users is very low. As a result, it is the views of the surrounding mountains from the valley, rather than the views from the surrounding mountains, that are more important.

The duration of views depends on the viewer group. Stationary viewer groups (such as those in nearby residences and visitor-serving businesses) and slow-moving viewer groups (such as certain dispersed recreational users) have more time to view the Project area. Fast-moving viewer groups (such as motorists in roadway traffic) have limited time to view the Project area. Due to the relatively undeveloped nature of the Project area, direct views of the Project area are primarily influenced by topography because there are few obstructions (such as walls, buildings, and vegetation) capable of blocking direct views of the Project area.

As discussed above under Scenic Roadway Programs, I-10 is a Riverside County-eligible scenic highway and runs past the Desert Center area, affording views of the contrasting desert and mountainous terrain. General panoramic vistas of high quality also exist from other roadways such as SR-177 and Kaiser Road. As discussed in Section 3.15, traffic volumes are light on SR-177 and on Kaiser Road in the ROI. Slightly over 100 vehicles were counted in a 24-hour period on Kaiser Road north of Lake Tamarisk.

Peak hour volume on I-10 near the intersection with SR-177 is between 2,800 and 3,000 vehicles. Approximately 26,500 vehicles use I-10 daily.

The photograph in Figure 3.16-2 was taken from SR-177 next to the Desert Lily Sanctuary and is characteristic of the visual resources found within the Project area. The broad valley has flat to gentle slopes and is very gently rolling. The landscape is horizontal with vast open space. The terrain has light brown to buff-colored soils and rock. The valley floor is smooth. Vegetation is rounded,

X:\DESERT SUNLIGHT\VOP.CDR

This westward-facing photograph was taken from State Route 177 near Desert Lily Sanctuary and is characteristic of the visual resources found within the region of influence.

DESERT SUNLIGHT SOLAR FARM

Figure 3.16-2

Typical View of Visual Resources in Region of Influence

clumpy, and mottled in form and follows the line of the terrain. Vegetation colors are tan, brown, green, and dark green. The texture of the vegetation is moderately coarse, consisting of grasses, creosote bushes, and isolated clusters of palm trees. The primary source of permanent water is the Colorado River aqueduct.

Clusters of buildings and structures are found along I-10, at Desert Center, at Lake Tamarisk, and at the landing field southwest of the Desert Lily Sanctuary. The former Kaiser iron ore mining facility, which also has clusters of mostly vacant housing, is northwest of Lake Tamarisk and the proposed Project. Other dispersed developments, such as residences, utility poles, and substations, are found throughout the ROI. Roads of varying composition crisscross the area of the proposed Project.

The buildings and structures, as well as vehicles using the roadways, are the primary sources of artificial light. One of the attractions for residents in less developed areas of the county is the brilliance of the nighttime sky on clear nights, unencumbered by lighting scattered over a large urban area. Residents also value certain wildlife that prefer habitat areas where there is little artificial lighting.

While not all areas of the CDCA would be rated high for viewer sensitivity, the BLM has received consistent feedback from the public that scenery is one of the most prized values of the CDCA. Congress also noted scenery as one of the values of the California Desert. MUC L is the only class that mentions scenery.

The ROI is surrounded by the scenic landscapes of Joshua Tree National Park (including the Joshua Tree Wilderness Area) and Chuckwalla Mountains Wilderness Area. The proposed Project is over 1.5 miles from the closest wilderness area. It is important to note that the portions of wilderness areas closest to the proposed Project have landscape characteristics that more closely resemble the proposed Project area than most of the wilderness area. Additionally, use of the surrounding mountains by dispersed recreational users is low *because of the general lack of facilities serving visitors, developed access, permanent natural water sources, and the steep terrain. While use levels in these areas are low, the remote and isolated character of the landscape and the access to unencumbered, panoramic views of the region are attributes that are highly valued by its users. As such, these users are likely to be highly sensitive to visual changes in adjacent landscapes that are visible from wilderness areas.*

3.17 WATER RESOURCES

3.17.1 Applicable Plans, Policies, and Regulations

Federal

Clean Water Act

The Federal Water Pollution Control Act was passed in 1972, and was amended in 1977 as the Clean Water Act (CWA, 33 USC 1251-1376). The CWA was reauthorized in 1981, 1987 and 2000. The CWA provides guidance for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters. Many pollutants are regulated under the CWA, including various toxic pollutants, total suspended solids, biological oxygen demand and pH (acidity/alkalinity measure scale).

Section 401

Section 401 of the CWA requires the State to issue Water Quality Certifications for licenses or permits issued for, among other things, the discharge of dredged or fill materials to 'waters of the United States' located within the State, including jurisdictional wetlands, headwaters and riparian areas.

Sections 301 and 402

Sections 301 and 402 of the CWA prohibit the discharge of pollutants (except for dredged or fill material, which is regulated under Section 404 of the CWA) from point sources to 'waters of the United States," unless authorized under a National Pollutant Discharge Elimination System (NPDES) permit, issued by EPA or by agencies in delegated states. The NPDES permit program has been delegated in California to the State Water Resources Control Board (SWRCB). The Colorado River Basin Regional Water Quality Control Board (RWQCB) administers the NPDES permits under the CWA in the Project area.

Section 404

Section 404 establishes a permit program administered by the US Army Corps of Engineers (USACE) regulating the discharge of dredged or fill material into "waters of the United States," including wetlands. Implementing regulations by USACE are found at 33 CFR Parts 320-330. Guidelines for implementation are referred to as the Section 404(b)(1) Guidelines and were developed by the EPA in conjunction with USACE (40 CFR Parts 230). The Guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that would have less adverse impacts. A final jurisdictional waters *determination was completed by the USACE on December 28, 2010. The USACE determined that there are no waters of the United States on the Project site.*

Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act (33 USC 401 et seq.) is administered by USACE. This section requires permits in navigable waters of the US for all structures such as riprap and activities such as dredging. Navigable waters are defined as those subject to the ebb and flow of the tide and susceptible to use in their natural condition or by reasonable improvements as means to transport interstate or foreign commerce. The USACE grants or denies permits based on the effects on navigation. Most activities covered under this act are also covered under Section 404 of the CWA.

Safe Drinking Water Act

This act was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources, which are rivers, lakes, reservoirs, springs, and groundwater wells. This act authorizes the EPA to set national health-based standards for drinking water to protect against both naturally occurring and man-made contaminants that may be found in drinking water. The act also mandates a groundwater/wellhead protection program be developed by each state in order to protect groundwater resources that are a source for public drinking water.

National Flood Insurance Program

The National Flood Insurance Program (NFIP) is administered by the Federal Emergency Management Agency (FEMA), a component of the US Department of Homeland Security. The NFIP is a federal program enabling property owners in participating communities to purchase insurance protection against losses from flooding. In support of the NFIP, FEMA identifies flood hazard areas throughout the US and its territories by producing flood hazard boundary maps, flood insurance rate maps, and flood boundary and floodway maps. Several areas of flood hazards are commonly identified on these maps. One of these areas is the special flood hazard area, a high-risk area defined as any land that would be inundated by a flood having a 1% chance of occurring in any given year (also referred to as the base flood). Participation in the NFIP is based on an agreement between communities and the federal government. The agreement states that if a community adopts and enforces a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas, the federal government will make flood insurance available to the community.

Executive Order 11988, Floodplain Management

This order directs all federal agencies to avoid the long-term and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.

Executive Order 11990, Protection of Wetlands

This order directs all federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative.

10 CFR Part 1022

This regulation establishes policy and procedures relating to the Department of Energy's (DOE) responsibilities under Executive Orders (EO) 11988 and 11990, including:

- DOE policy regarding the consideration of floodplain and wetland factors in DOE planning and decision making; and
- DOE procedures for identifying proposed actions located in a floodplain or wetland, providing opportunity for early public review of such proposed actions, preparing floodplain or wetland assessments, and issuing statements of findings for actions in a floodplain.

To the extent possible, DOE shall accommodate the requirements of EO 11988 and EO 11990 through applicable DOE NEPA procedures or, when appropriate, the environmental review process under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC. 9601 *et seq.*).

Colorado River Accounting Surface Rule

The Colorado River Account Surface Rule (Proposed Rule) was proposed by the U.S. Bureau of Reclamation (Reclamation) in the Federal Register on July 16, 2008 (43 CFR Part 415), as a means for tracking and allocating water use along the Colorado River, including in the vicinity of the Project. The Proposed Rule has not been promulgated as a final regulation.

USGS Report 2008-5113 (Wiele et al 2008) updated the location and extent of the Accounting Surface in support of the Proposed Rule. Figure 6 in that USGS document shows that the Project site is located within the areal extent of the river aquifer, and that the Accounting Surface within this aquifer is predicted to be at an elevation of between 238 and 242 feet above mean sea level (msl). The Accounting Surface is proposed to identify which groundwater wells, located outside the floodplain of the Colorado River, pump groundwater that will be replaced by surface water from the Colorado River and, thus, would need to be accounted for as consumptive use of Colorado River water as required under the Consolidated Decree (547 U.S.150 (2006)), (Wiele et al, 2008, page 3).

The Accounting Surface is defined as the elevation and slope of the static water table in the river aquifer that would exist if the water in the aquifer were derived only from the Colorado River (Wilson and Owen-Joyce 1994, Wiele et al 2008). The river aquifer is defined as those saturated sediments that are hydraulically connected to the Colorado River and includes groundwater basins and tributary valleys that are adjacent to the river. The static water level, which is the measured elevation of the water table not affected by groundwater withdrawal, is used to determine whether a well is pumping water that would be replaced by Colorado River water (Wiele et al 2008). A static water level below the Accounting Surface is presumed to yield water that will be replaced by water from the Colorado River (43CFR 415.2(4), Weile et al 2008). Groundwater wells with static water levels above the Accounting Surface are presumed to yield water that will be replaced by precipitation, mountain front recharge, or inflow from tributary valleys (tributary water).

State of California

California Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act of 1967, Water Code Section 13000 et seq. regulates surface water and groundwater within California and assigns responsibility for implementing CWA §401 through 402 and 303(d). It established the SWRCB and divided the state into nine regions, each overseen by a RWQCB, and requires the SWRCB and the nine RWQCBs to adopt water quality criteria to protect State waters. Those criteria include the identification of beneficial uses, narrative and numerical water quality standards, and implementation procedures. The SWRCB is the primary state agency responsible for protecting the quality of the state's surface and groundwater supplies, but much of its daily implementation authority is delegated to the nine RWQCBs. Water quality criteria for the proposed Project area are contained in the Water Quality Control Plan for the Colorado River Basin - Region 7 (Basin Plan) which was adopted in 1993. This plan sets numerical and/or narrative water quality standards controlling the discharge of wastes to the State's waters and land. *Due to the lack of any perennial waters of the state in or near the Project area, and due to the low probability that septic system discharge associated with the Project would impact groundwater, it is not anticipated that the RWQCB would issue Waste Discharge Requirements for either the stormwater discharge or septic system discharge*

associated with the Project. Sunlight will coordinate with the Riverside County Department of Environmental Health to determine whether a Report of Waste Discharge for the septic system would need to be filed with the RWQCB.

Senate Bill 610

Senate Bill 610 (SB 610), approved by the Governor in October 2001, requires that all projects, as defined under Water Code Section 10912, must provide a water supply assessment (WSA) to demonstrate that there is a sufficient water supply available for the project. SB 610 applies only if the project is subject to the requirements of CEQA. If there is a public water system supplying water for the project, the public water system must provide a WSA, otherwise the lead agency for the project must supply a WSA. The WSA must include an evaluation of whether the total projected available water supplies, determined to be available during normal, single dry, and multiple dry water years during a 20-year projection, would meet the projected water demand associated with the proposed project.

Water Code Section 10912 defines a project as follows:

- A proposed residential development of more than 500 dwelling units;
- A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space;
- A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space;
- A proposed hotel or motel, having more than 500 rooms;
- A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area;
- A mixed-use project that includes one or more of the projects specified in this subdivision;
- A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500-dwelling project.

With regard to last item in this list, one acre-foot of water can generally serve two to three households annually, so one dwelling unit typically consumes 0.3 to 0.5 acre-foot of water per year (DWR 2003).

The proposed project does not meet the first six criteria above to qualify as a project under Water Code Section 10912. The final criterion speaks to total project water demand and also indicates that the proposed Project would not be considered a project under Water Code Section 10912. The projected water demand for the proposed Project totals *1,506 to 1,606* acre-feet for the 26 months required for project construction and approximately 0.2 acre-foot per year for operations and maintenance of the Solar Farm*; and less than 0.1 acre-foot per year for operations and maintenance of Red Bluff Substation*. Over the 20-year evaluation period, total water usage for the proposed project would be on the order of *1,511 to 1,611* acre-feet. Conversely, over the 20-year evaluation period for a 500-unit project, total water usage would be on the order of 5,000 acre-feet (250 acre-feet per year for 20 years). Because total estimated water use for the proposed Project falls well below the total

water usage standard outlined in the last bullet above, the proposed Project would not be considered a project under the Water Code, and the provisions of SB 610 do not apply.

California Construction General Stormwater Permit

CWA §402 regulates construction-related stormwater discharges to surface waters through the NPDES program. In California, the EPA has delegated to the SWRCB the authority to administer the NPDES program through the RWQCBs and has developed a general permit for Stormwater Discharges Associated with Construction Activities, the Construction General Permit (Water Quality Order 99-08-DWQ). Construction activities that disturb more than one acre are required to obtain an NPDES Construction General Permit from the SWRCB. The General Permit requires the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that specifies Best Management Practices (BMPs) for controlling stormwater, reduces pollutants that leave the site and minimize erosion caused by the project. *Note that the California Construction General Stormwater Permit is applicable only where there is a linkage to "waters of the United States," thereby establishing a federal nexus under the Federal Clean Water Act.*

California Industrial Stormwater Program

Industrial activities with the potential to impact stormwater discharges are required to obtain an NPDES permit for those discharges. In California, an Industrial Stormwater General Permit, Order 97-03-DWQ (General Industrial Permit CAS 000001) may be issued to regulate discharges associated with 10 broad categories of industrial activities, including electrical power generating facilities. The General Industrial Permit requires the implementation of management measures that will protect water quality. In addition, the discharger must develop and implement a SWPPP and a monitoring plan. The monitoring plan requires sampling of stormwater discharges during the wet season and visual inspections during the dry season. A report must be submitted to the RWQCB each year by July 1 documenting the status of the program and monitoring results. *Permits associated with the California Industrial Stormwater Program Permit are applicable only where there is a linkage to "waters of the United States," thereby establishing a federal nexus under the Federal Clean Water Act.*

California Water Code Section 1200, Water Rights

The law in California requires that water be identified as one of three categories: surface water, percolating groundwater, and "subterranean streams that flow through known and definite channels". Only surface water and subterranean stream water are within the permitting jurisdiction of the SWRCB. Appropriation of those waters requires a SWRCB permit, and is subject to various permit conditions.

Water subject to appropriation is defined in Water Code Section 1201, as "all water flowing in any natural channel", except water that is or may be needed for use upon riparian land or water that is otherwise appropriated. The SWRCB's authority over groundwater extends only to the water in un-appropriated subterranean streams that flow through known or defined channels, except as it is or may be reasonably be needed for useful and beneficial purposes upon lands riparian to the channel through which it is flowing.

"Percolating groundwater" has two sub-classifications: overlying land use, and surplus groundwater. Land owners overlying percolating groundwater may use it on an equal basis and share a right to reasonable use of the groundwater aquifer. In this right, a user cannot take unlimited quantities

without regard to the needs of other users. Surplus groundwater may be appropriated for use on non-overlying lands, provided such use will not create an overdraft condition.

Streambed Alteration Agreements, California Fish and Game Code, Sections 1601 – 1603

Under these sections of the Fish and Game Code, the Applicant is required to notify the California Department of Fish and Game (CDFG) prior to constructing any project that would divert, obstruct or change the natural flow, bed, channel, or bank of any river, stream, or lake. Preliminary notification and project review generally occur during the environmental process. When an existing fish or wildlife resource may be substantially adversely affected, CDFG is required to propose reasonable project changes to protect the resource. These modifications are formalized in a Streambed Alteration Agreement that becomes part of the plans, specifications, and bid documents for the project.

State Water Resources Control Board Resolution 88-63

On May 19, 1988, the SWRCB adopted the Policy entitled "Sources of Drinking Water", which was later revised by Resolution No. 2006-0008. The purpose was to provide sufficient detail to be incorporated into the RWQCB Water Quality Control Plans (Basin Plan) to judge clearly what is or is not a source of drinking water for various purposes. All surface and ground waters of the State are considered to be suitable, or potentially suitable, for municipal or domestic water supply and should be so designated by the Regional Boards with the exception of surface and ground waters where:

- The Total Dissolved Solids (TDS) exceed 3,000 milligram per liter (mg/L) (5,000 microSiemens per centimeter (µS/cm), electrical conductivity) and it is not reasonably expected by RWQCB to supply a public water system, or
- There is contamination, either by natural processes or by human activity (unrelated to the specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices, or
- The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day.

Groundwater Protection Areas and Wellhead Protection

The overall concept behind wellhead protection is to develop a reasonable distance between point sources of pollution and public drinking water wells so that releases from point sources are unlikely to impact groundwater from the well. The California Department of Public Health established the Drinking Water Source Assessment and Protection Program, which guides local agencies in protecting surface water and groundwater that are sources of drinking water. The California Department of Pesticide Regulation's Groundwater Protection Program is charged with identifying areas sensitive to pesticide contamination and develops mitigation measures and regulations to prevent pesticide movement into groundwater systems.

Regional and Local Regulations

County of Riverside

The Desert Center Area Plan within the County of Riverside General Plan aims to preserve the natural character of the unincorporated areas of Riverside County and Desert Center. The plan

encourages clustering of development for the preservation of contiguous open space, aims to limit off-road vehicle use, and requires new development to conform with desert tortoise critical habitat designation requirements.

The Riverside County Flood Control and Water Conservation District is the regional flood management authority for the western part of Riverside County. The responsibility for the eastern part of the County is borne by a combination of the County Transportation Department, the Coachella Valley Water District and the various cities and a variety of local entities.

Riverside Code Section 13.20 (Ordinance 682): Construction, Reconstruction, Abandonment and Destruction of Wells

This ordinance provides minimum standards for construction, reconstruction, abandonment, and destruction of all wells. Permits shall be issued after compliance with the standards provided and incorporated by reference in this ordinance. Plans shall be submitted to the Department demonstrating compliance with such standards.

Standards for the construction, reconstruction, abandonment, or destruction of wells shall be the standards recommended in the Bulletins of the California Department of Water Resources as follows: Bulletin No. 74-81 Chapter II Water Wells, and Bulletin No. 74-90 (Supplement to Bulletin No. 74-81) and as these Bulletins may be amended by the State of California from time to time.

Water from all new, repaired, and reconstructed community water supply wells, shall be tested for and meet the standards for constituents required in the California Code of Regulations, Title 22, *Domestic Water Quality and Monitoring.*

Riverside Code Section 8.124 (Ordinance 650.5) – Septic System

This ordinance regulates the discharge of sewage in the unincorporated areas of Riverside Country. An on-site water treatment system (OWTS) means any individual or community onsite wastewater treatment, pretreatment and dispersal system including septic systems. An application must be submitted to the Riverside County Department of Environmental Health for approval, and the OWTS will be subject to an annual operating permit.

3.17.2 Water Resources Existing Conditions

The proposed Desert Sunlight Solar Farm is located in eastern Riverside County, six miles north of the Desert Center community, in the Chuckwalla Valley. The Chuckwalla Valley generally trends northwest to southeast and is surrounded by the Chuckwalla Mountains to the south, Eagle Mountains to the west and north, Coxcomb Mountains to the north, and Palen Mountains to the East.

The California Interagency Watershed Mapping Committee (CIWMC) has developed a system for naming and delineating watersheds and subunits in California, beginning with 10 Hydrologic Regions that each covers millions of acres, and which are progressively subdivided into five smaller nested levels. The smaller nested levels in order of decreasing size are 1) Hydrologic Units (HU), 2) Hydrologic Areas, 3) Hydrologic Sub-Areas, 4) Super Planning Watersheds and 5) Planning Watersheds. The proposed project is located in the Colorado Hydrologic Region, and is within the Chuckwalla HU (HU# = 17) and entirely within the Palen Hydrologic Area subdivision of the Chuckwalla HU. The Chuckwalla HU contains 1,268,650 acres and the Palen Hydrologic Area is

419,660 of these acres (see Figure 3.17-1). The proposed project is contained within the US Geological Survey (USGS) 8-digit HU code 18100100, known as the Southern Mojave (CIWMC 1999). The following discussion of surface water resources relates to the Chuckwalla HU, unless identified otherwise.

Surface Water Resources

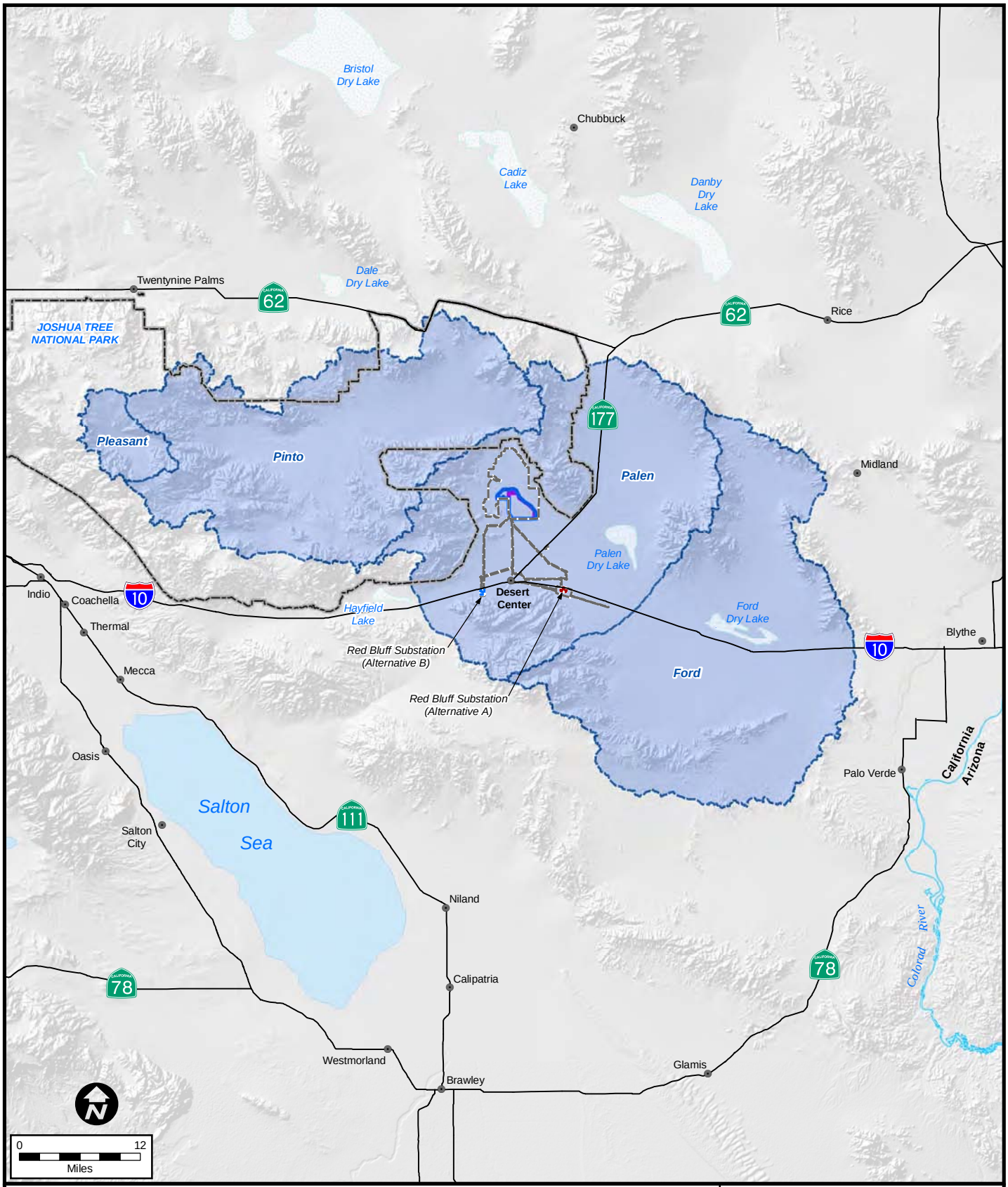
The Porter-Cologne Water Quality Control Act divided the state into nine regions, each overseen by an RWQCB. The proposed Project is within the Colorado River Basin Region, which corresponds almost exactly to the area of the Colorado Hydrologic Region discussed above. There are seven planning areas within the region, and the proposed Project is in the Hayfield Planning Area (SWRCB 2006). This corresponds closely to the Chuckwalla HU described above, although the Hayfield Planning Area includes two additional small watersheds. No perennial streams flow in this planning area. The average annual precipitation in the Hayfield Planning Area ranges from less than 3 inches in the lower valleys to 8 inches in the highest mountains. Almost all of the moisture from rain in the Hayfield Planning Area is lost through evaporation and evapotranspiration (SWRCB 2006). Although there are no perennial streams in the Hayfield Planning Area, Pinto Wash is an ephemeral stream that serves as the main drainage in the Project Study Area when there is surface water, and surface water *generally* flows from west to east. Pinto Wash traverses the Project Study Area for approximately 6 miles, trending northwest to southeast. Pinto Wash is just east of the Solar Farm Site B and C. Big Wash is another large ephemeral stream that traverses the Project Study Area northwest to southeast (for approximately 4.5 miles), although most of this wash is just south of the Project Study Area. A third ephemeral stream, Eagle Creek, terminates at the Project Study Area and crosses the Project Study Area for a little over 2 miles. All three of these ephemeral streams originate north and west of the Project Study Area, and all three of them are fed by rainfall. These three ephemeral streams, along with multiple other, smaller ephemeral streams, are shown in Figure 3.17-2. A few intermittent springs exist in the northwest portion of the Chuckwalla Valley, but there are no springs that are documented as permanent or year-round (Eagle Crest Energy Company 2008).

There are also no outlets from the Chuckwalla Valley, which is internally drained. *Desert washes within the Chuckwalla Valley either terminate in localized groundwater sinks (as is the case for the proposed Project), or flow to* Palen Dry Lake, approximately five miles east of the Project Study Area, or to Ford Lake, southeast of Palen Dry Lake. Both Palen Dry Lake and Ford Lake are playas, which are shallow, centrally located basins or depressions where water gathers after a rain but evaporates quickly. Palen Dry Lake is a wet playa, with shallow groundwater discharge at the surface due to evaporation, and is approximately three miles wide and four miles long. Ford Lake is a "dry playa," with groundwater occurring well below the ground surface, and is approximately two miles wide and seven miles long.

The Colorado River Aqueduct flows along the northern and western edges of the Project Study Area, less than a mile from the Project Study Area (see Figure 3.17-2), and it is underground along the western edge. The Colorado River is approximately 50 miles east of the eastern edge of the Project Study Area.

Although there are no perennial surface water features in the basin, storm water can have a significant effect on an area's surface water hydrology. Stormwater hydrology studies were performed for First Solar for the Solar Farm Layout A (no longer being considered in this EIS but

X:\GIS\Desert_Sunlight\MXD_Files\Watershed.mxd



LEGEND

- Perennial Water Feature
- Intermittent Water Feature
- Desert Sunlight Study Area Boundary
- Solar Farm Boundary (Alternative B)
- Solar Farm Boundary (Alternative C)
- Joshua Tree National Park Boundary
- Hydrologic Areas

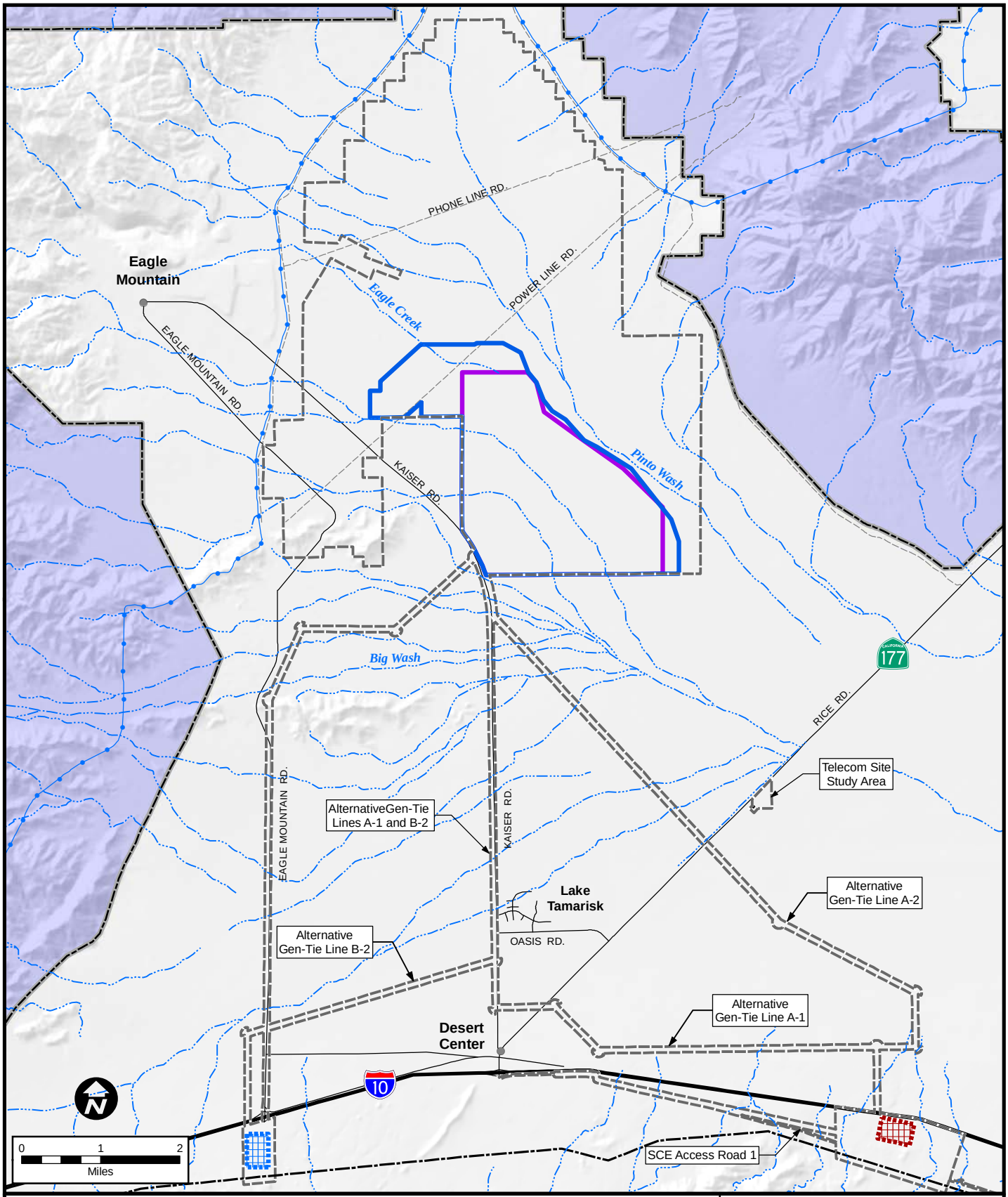
Source: Department of Water Resources, Hydrologic Regions of California

DESERT SUNLIGHT SOLAR FARM

Figure 3.17-1

Chuckwalla Hydrologic Unit (Watershed)

X:\GIS\Desert_Sunlight\MXD_Files\Hydrology.mxd



LEGEND

- Intermittent Creek
- Aqueduct
- Desert Sunlight Study Area Boundary
- Solar Farm Boundary (Alternative B)
- Solar Farm Boundary (Alternative C)
- Red Bluff Substation (Alternative B)
- Red Bluff Substation (Alternative A)
- Joshua Tree National Park Boundary
- Devers-Palo Verde Transmission Line (DPV1)

Source: USGS, 2008.

DESERT SUNLIGHT SOLAR FARM

Figure 3.17-2

Surface Water Resources

the information is relevant to the analysis) (AECOM 2010a; Appendix G) and the Solar Farm Layout B (AECOM 2010b; Appendix G) to evaluate the impacts of the proposed Project facilities on surface water flow, sediment transport, local scour effects and geomorphology of the landforms within the project site. The boundaries and elevations of hydrologic basins for the study were defined using USGS's National Elevation Dataset and EPA's BASINS model, and are shown in Figure 2 of the stormwater hydrology study reports (AECOM 2010a and 2010b; Appendix G). Slightly different model boundaries were used for the Solar Farm Layout A model versus the Solar Farm Layout B model, and both model areas include most of the area of the Solar Farm Layouts A and B, including the portions of Eagle Creek and Big Wash that cross the Solar Farm Layouts A and B. The model area also includes the portion of Pinto Wash that is just east of the Solar Farm Layouts A and B. A two-dimensional model (FLO-2D) was built to simulate flow patterns and sediment transport in the Solar Farm areas, with hydrologic flows for the different storm scenarios estimated using the USACE HEC-HMS model. The model was run for the design case (100-year storm), the 10-year storm and an Additional Considerations Case (100-year storm with 100 percent soil saturation prior to the storm), to provide a conservative evaluation of potential impacts from the proposed Project.

The hydrologic basins for the model show flow occurring from the northwest to the southeast across the Solar Farm Layouts A and B, consistent with the overall topography of the Chuckwalla Valley. Peak outflow under existing conditions for the design case (Solar Farm Layout A for the 100-year storm) was calculated to be 24,811 cubic feet per second (cfs), with a peak velocity of 4.6 feet per second (Figure 8, AECOM 2010a; Appendix G). *The maximum peak flow depth on site was 2.2 feet, occurring in locations in the eastern portion of the site, caused by influence of the Pinto Wash, which is located immediately east of SF-B (Figure 5, AECOM 2010a; Appendix G).* The model results show that sheet flow occurs across the Solar Farm Layout A to a maximum depth of 0.1 to 0.5 foot for both the 10-year and 100-year storm (Figures 5 and 11, AECOM 2010a; Appendix G). *The model results show that sheet flow occurs across the Solar Farm B to a maximum peak flow depth on site of 1.4 feet for the 10-year storm and 2.2 feet for the 100-year storm event (Tables 3 and 4, AECOM 2010a; Appendix G).*

A jurisdictional waters delineation was submitted to the USACE on September 16, 2010, for the Project Study Area (Ironwood Consulting and Huffman-Broadway Group, Inc., 2010), in accordance with the CFR definitions of jurisdictional waters, the Wetlands Delineation Manual (USACE 1987), the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) (USACE 2008), *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar and McColley 2008), and supporting guidance documents, such as the Rapanos guidance (December 2008).

Results of the delineation indicated that there were no areas within the Project location that met the USACE criteria for wetlands. *USACE has concurred that it has no jurisdiction over any area within the Project boundary under the Federal Clean Water Act.*

Surface Water Quality

Under section 303(d) of the CWA, states, territories, and authorized tribes are required to develop lists of impaired waters. Impaired waters are defined as "waters that are too polluted or otherwise degraded to meet the water quality standards set by states, territories, or authorized tribes." The law further requires that these jurisdictions establish priority rankings for waters on the lists and develop a Total Maximum Daily Load (TMDL) for these waters. A TMDL is a calculation of the maximum

amount of a pollutant that a water body can receive and still safely meet water quality standards (EPA 2009c).

For the proposed project site, the Colorado River Basin RWQCB (CRBRWQCB) Region 7 is responsible for maintaining the Section 303d impaired waters list. The most recent adopted 303d impaired waters list is from 2006. Several impaired water bodies are identified on this list for the Colorado River Basin Region, but none of these impaired water bodies are within the Hayfield Planning Unit, so there are no impaired water bodies on the proposed project site (CRBRWQCB 2006). Additionally, there is no other surface water quality data available for the Project Study Area.

Groundwater Resources

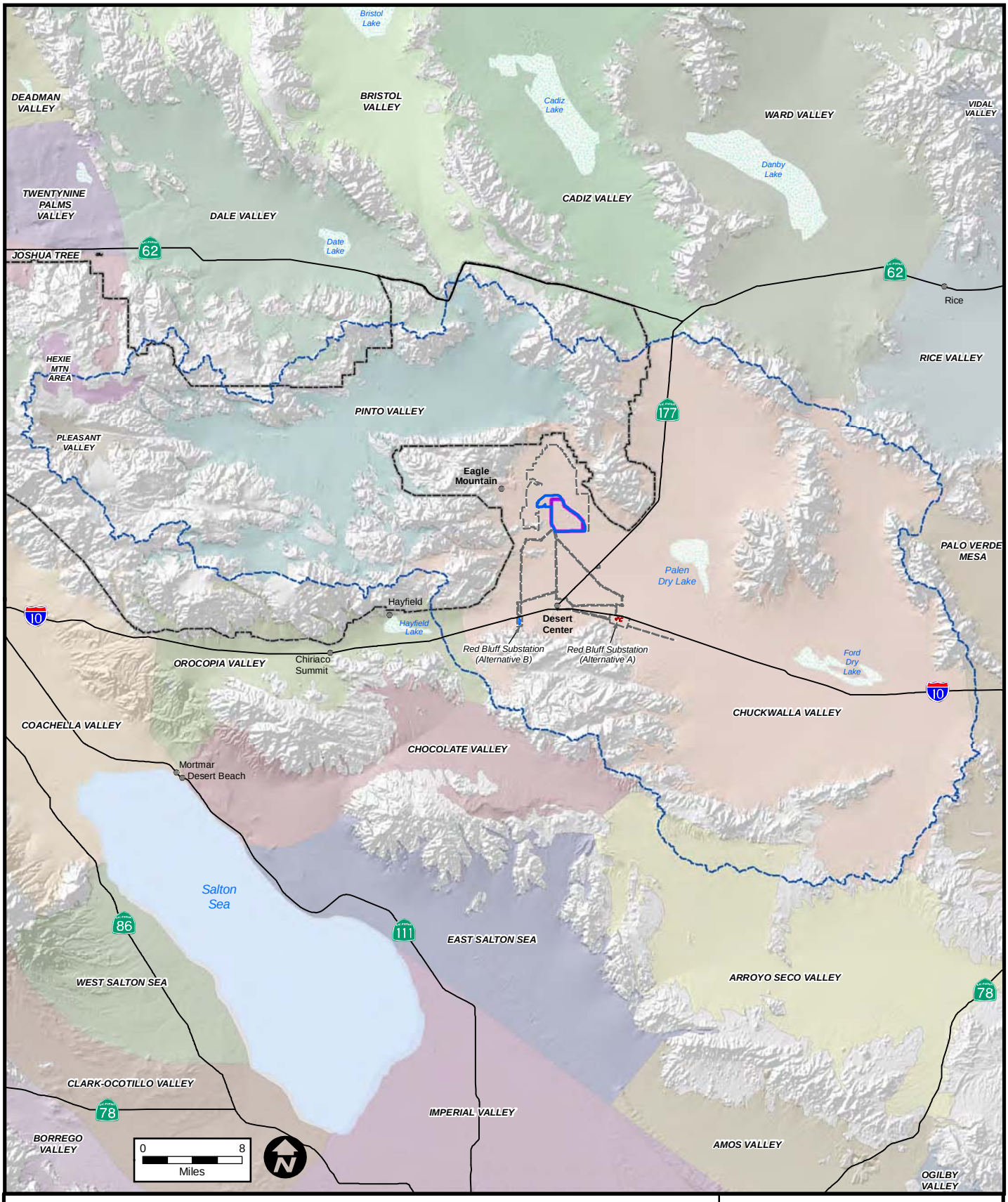
The following terms are defined for readers to facilitate their understanding of this section (DWR 2003, except where noted):

- Groundwater—Water that occurs beneath the land surface and fills the pore spaces of the alluvium, soil, or rock formation in which it is situated.
- Aquifer—A body of rock or sediment that is sufficiently porous and permeable to store, transmit, and yield significant or economic quantities of groundwater to wells and springs.
- Transmissivity—A measure of an aquifer's ability to transmit groundwater (the ability of water to move through the aquifer) horizontally through its entire saturated thickness. Mathematically, transmissivity is defined as the product of hydraulic conductivity and the aquifer thickness.
- Specific Yield—The volume of water that an unconfined aquifer releases from storage per unit surface area of the aquifer per unit decline in the water table (Freeze and Cherry 1979). For example, if the height of the water table of the aquifer declines by 10 feet, 1 foot (10 percent of 10 feet) of water would be released from the aquifer.
- Perennial Yield—The maximum quantity of water that can be annually withdrawn from a groundwater basin over a long period (during which water supply conditions approximate average conditions) without developing an overdraft condition.

The project area is located within the Chuckwalla Valley Groundwater Basin (California Department of Water Resources [DWR] Basin #7-5), which has a surface area of 940 square miles (605,000 acres). The groundwater basin is contained almost entirely within the Chuckwalla HU (see Figure 3.17-3). Water bearing units in the groundwater basin range in age from Pliocene to Quaternary, and include Quaternary alluvium, the Pleistocene-age Pinto Formation and the Pliocene-age Bouse Formation. The maximum thickness of these sediments is 1,200 feet and the average specific yield in the upper 500 feet is estimated to be 10 percent. The Quaternary alluvium is likely the most important aquifer in the basin (DWR 2003).

The Chuckwalla Valley groundwater basin is recharged by flow from the Pinto Valley Groundwater Basin located west of Chuckwalla Valley. DWR (2003) reports that Chuckwalla Valley is also recharged by flow from the Cadiz Valley Groundwater Basin, located adjacent to the northwest portion of Chuckwalla Valley. A study by Black and Veatch, however, indicated that Cadiz Valley groundwater does not flow into the Chuckwalla HU (Eagle Crest Energy Company 2008). Similar to surface water flow, groundwater flow is from northwest to southeast in the western portion of the Chuckwalla Valley groundwater basin and west to east in the eastern portion of the basin.

X:\GIS\Desert_Sunlight\MXD_Files\GW_Basin.mxd



LEGEND

- Desert Sunlight Study Area Boundary
- Solar Farm Boundary (Alternative B)
- Solar Farm Boundary (Alternative C)
- Red Bluff Substation (Alternative B)
- Red Bluff Substation (Alternative A)
- Chuckwalla Hydrologic Unit
- Joshua Tree National Park Boundary

Source:
Department of Water Resources, Hydrologic Regions of California

DESERT SUNLIGHT SOLAR FARM

Figure 3.17-3

Groundwater Basins

There are more than 60 wells in the Chuckwalla Valley *G*roundwater *B*asin, with an average pumping rate for each well of about 1,800 gallons per minute (gpm) and a maximum reported pumping rate of 3,900 gpm (DWR 1975). Depth to groundwater in the eastern part of the basin ranges from approximately 20 feet to 270 feet below ground surface (WorleyParsons 2009). There are 14 known groundwater wells within a two-mile radius of the Project Study Area (Figure 3.17-4). Two of these are owned by Kaiser Steel, and the remaining twelve are private wells.

Reported transmissivities range from 95 to 247,000 gallons per day per foot (gpd/ft), but are generally in the range of 45,000 to 147,000 gpd/ft. The perennial yield of the *Chuckwalla Valley Groundwater B*asin is between approximately *2,608 and 3,346* acre-feet per year (AFY) (BLM and CEC, 2010; *WorleyParsons, 2009*).

Groundwater budgets were developed for the Chuckwalla Valley groundwater basin for the Palen Solar Power Project EIS (BLM and CEC 2010) and the Genesis Solar Energy Project (WorleyParsons 2009). Both groundwater budgets identified recharge from precipitation as the greatest source of inflow to the basin, and groundwater pumpage as the greatest source of outflow from the basin. Both groundwater budgets indicated there was a net inflow into the basin, with the Palen Solar Power Project EIS identifying a net inflow of 2,608 AFY and the groundwater resources investigation for the Genesis Solar Energy Project identifying a net inflow of 2,446 AFY.

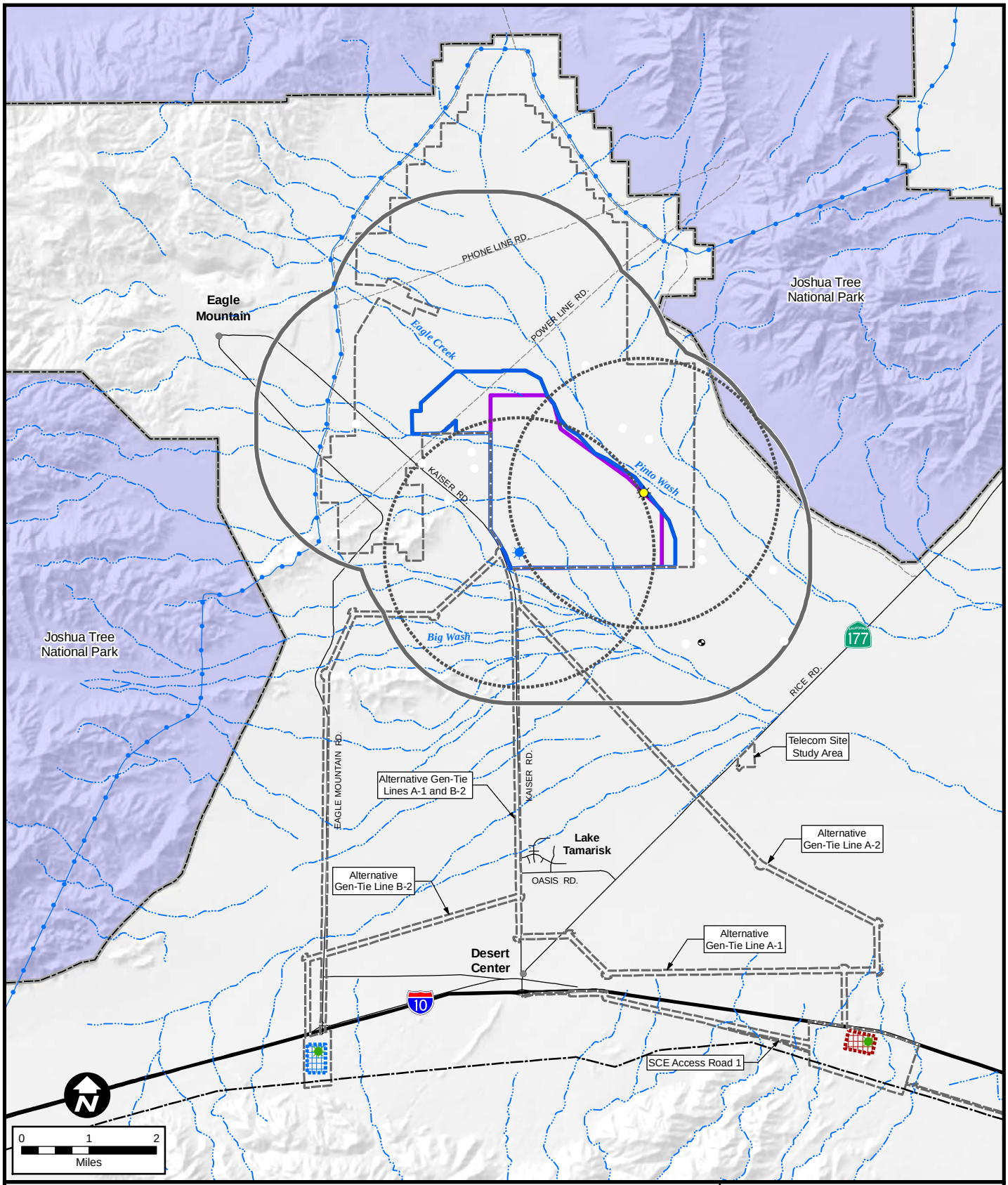
Historically, the greatest use of groundwater in the basin was for agriculture. The highest amount of recorded pumping in the basin occurred in 1986, when approximately 21,000 acre-feet (AF) was pumped, mostly for jojoba and asparagus farming, which had begun being planted in 1981. *Other major historical water users include the former Eagle Mountain Mine and associated housing.* From 1950 to 1981, water levels were relatively stable in the basin, but during the years of highest water use, water levels declined in the vicinity of the pumping by up to 130 feet, indicating that groundwater levels in the basin are very sensitive to pumping. Since 1986, water use has stabilized in the range of 5,000 to 7,000 AFY, and groundwater levels between 1986 and 2002 recovered over 100 feet (Eagle Crest Energy Company 2008).

Eagle Crest Energy Company has proposed the construction of a pumped storage project within a mile of the proposed project site. The Eagle Mountain Pumped Storage Project *proposes to* pump water from a lower reservoir to an upper reservoir using off-peak energy, and then run the water back down to the lower reservoir during high energy demand periods. The initial filling of the reservoirs (24,200 AF over two years) *would* be accomplished using either local groundwater or water purchased outside the basin. *For a discussion of the Colorado River Accounting Surface, refer to the previous Applicable Plans, Policies, and Regulations subsection of this chapter.*

Groundwater Quality

TDS concentrations in groundwater across the Chuckwalla Valley basin ranges from 274 to 12,300 mg/L, with the lowest concentrations occurring in the western part of the basin, where TDS concentrations range from 274 to 730 mg/L. EPA has established a secondary (non-mandatory) standard for TDS in drinking water of 500 mg/L, based upon potential odor and taste concerns (EPA 2009d). Overall, the TDS concentrations are considered high for domestic use, and the groundwater may have elevated levels of sulfate, chloride and fluoride (DWR 2003).

X:\GIS\Desert_Sunlight\MXD_Files\Wells.mxd



LEGEND

- Existing Well Location
- Proposed Permanent Well Location
- Proposed Temporary Well Location
- Proposed Substation Well Location
- 2-Mile Proposed Well Buffer
- 2-Mile Site Buffer
- Desert Sunlight Study Area Boundary
- Solar Farm Boundary (Alternative B)
- Solar Farm Boundary (Alternative C)
- Red Bluff Substation (Alternative B)
- Red Bluff Substation (Alternative A)
- Intermittent Creek
- Aqueduct
- Devers-Palo Verde Transmission Line (DPV1)

Source: USGS, 2008.
AECOM, 2010.

DESERT SUNLIGHT SOLAR FARM

Figure 3.17-4

Project Study Area Well Locations

3.18 CUMULATIVE ANALYSIS

3.18.1 Introduction

In accordance with NEPA, this EIS analyzes cumulative effects of the proposed Project and its alternatives in conjunction with other past, present, and reasonably foreseeable actions that affect or could affect the area. Because CPUC intends to use this document for the environmental review required for its approval of SCE's Red Bluff Substation, this document also considers the CEQA requirements for cumulative analysis.

NEPA and CEQA have similar definitions of "cumulative impact." According to the CEQ's regulations implementing NEPA, "cumulative impact" or effect "is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR §1508.7). "Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR §1508.7). Under NEPA, when determining what is "significant," both context and intensity are considered. When considering intensity of an effect, we consider "[w]hether the action is related to other actions with individually minor but cumulatively significant impacts. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts" (40 CFR §1508.27[b][7]).

Under CEQA Guidelines, "a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts" (14 California Code of Regulations [CCR] §15130[a][1]). Cumulative impacts must be addressed if the incremental effect of a project, combined with the effects of other projects, is "cumulatively considerable" (14 CCR §15130[a]). Such incremental effects are to be "viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects" (14 CCR §15164[b][1]). Together, these projects compose the cumulative baseline that forms the basis of the cumulative impact analysis.

CEQA also states that both the severity of impacts and the likelihood of their occurrence are to be reflected in the discussion, "but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion of cumulative impacts shall be guided by standards of practicality and reasonableness, and shall focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact" (14 CCR §15130[b]).

To comply with both NEPA and CEQA, a cumulative projects scenario has been developed for this EIS that identifies and evaluates projects that already exist within the *relevant geographic scope defined for each resource area* or are reasonably foreseeable to be constructed or begin operation during the time of activity associated with the proposed Project. This scenario is consistent with that developed for other large-scale solar projects in eastern Riverside County.

3.18.2 Definition of Cumulative Project Scenario

Cumulative impacts analysis is intended to highlight past, *present, and reasonably foreseeable* actions that are closely related either in time or location to the project being considered, catalogue past projects and discuss how they have harmed the environment, and discuss past actions even if they were

undertaken by another agency or another person. Most of the projects listed in the cumulative projects tables in Section 3.18.4 have or will be required to undergo their own independent environmental review under either NEPA and/or CEQA.

Under NEPA, an EIS must provide a detailed catalogue of past, present, and reasonably foreseeable future projects, and provide an adequate analysis of how these projects, in conjunction with the proposed action, may adversely impact the environment. While NEPA requires cataloging of past projects, it also requires a discussion of consequences of those past projects.

Under CEQA, there are two acceptable and commonly used methodologies for establishing the cumulative impact baseline setting: the "list approach" and the "projections approach." The first approach would use a "list of past, present, and probable future projects producing related or cumulative impacts" (14 CCR §15130[b][1][A]). The second approach is to use a "summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact" (14 CCR §15130[b][1][B]). This EIS uses the "list approach" to provide a tangible understanding and context for analyzing the potential cumulative effects of the Project.

3.18.3 Methodology and Approach

Given the selection of the "list approach" for the Project's cumulative impact analysis, there needs to be a determination of the general geographic area within which to identify the baseline for cumulative impacts analysis for each resource area. The BLM identified the California desert (California Desert District area) as the largest area within which cumulative effects should be assessed for all disciplines. However, within the desert region, the specific area of cumulative effect varies by resource. For this reason, each discipline has an identified geographic scope for analysis of cumulative impacts.

This EIS evaluates cumulative impacts within the analysis of each resource area, following these steps:

1. Define the geographic scope of the cumulative impact analysis area for each resource, based on the potential area within which impacts of the Project could combine with those of other projects.
2. Evaluate the effects of the Project on that resource in combination with past and present projects within the geographic area defined for each resource.
3. Evaluate the effects of the Project on that resource with reasonably foreseeable future projects within the geographic area defined for each resource.

Each of these steps is described below.

Geographic Scope of Cumulative Analysis

The area of cumulative effect varies by resource. For example, air quality impacts tend to disperse over a large area, while traffic impacts are typically more localized. For this reason, the geographic scope for the analysis of cumulative impacts must be identified for each resource area.

The analysis of cumulative effects considers a number of variables including geographic (spatial) limits, time (temporal) limits, and the characteristics of the resource being evaluated. The geographic scope of each analysis is based on the topography surrounding the Project and the natural boundaries of the resource affected, rather than jurisdictional boundaries. The geographic scope of cumulative effects will often extend beyond the scope of the direct effects, but not beyond the scope of the direct and indirect effects of the proposed action and alternatives.

In addition, each project in a "list-based" approach will have its own implementation schedule, which may or may not coincide or overlap with the Project schedule. This is a consideration for short-term impacts from the Project. However, to be conservative, the cumulative analysis assumes that all projects listed in the cumulative scenario are built and operating during the operating lifetime of the proposed Project.

Project Effects in Combination with Past, Present, and Reasonably Foreseeable Future Projects

The intensity, or severity, of the cumulative effects should include the magnitude, geographic extent, duration and frequency of the effects (CEQ 1997). The magnitude of the effect reflects the relative size or amount of the effect; the geographic extent considers how widespread the effect may be; and the duration and frequency refer to whether the effect is a one-time event, intermittent, or chronic (CEQ 1997). CEQA similarly requires that the Project's contribution to cumulative impacts depends on the severity and duration of the Project's impacts on a resource. Whether these impacts are significant may be determined by applying the significance criteria for each resource.

The impacts of the proposed Project are evaluated for each discipline added to the current baseline: the past, present (existing) and reasonably foreseeable projects within the geographic scope identified for each resource area.

The geographic scope of reasonably foreseeable projects that could contribute to the cumulative effects scenario depends on the extent of the Project effects for each resource area, but could include projects in the immediate I-10 corridor, as well as the larger California Desert District. The discussion in Section 3.18.4 illustrates there are a number of projects in the immediate area around the I-10 corridor with impacts that could combine with those of the proposed Project.

3.18.4 Potential Cumulative Projects and Projections

The projects considered part of the cumulative scenario are (a) closely related, completed, past projects; (b) projects approved and under construction; (c) projects approved but not yet under construction; and (d) projects proposed but not approved. They are renewable energy projects, transportation projects, infrastructure improvement projects, pipeline projects, and other projects that meet these criteria.

Renewable Energy Projects in the California Desert District

A large number of renewable energy projects have been proposed on BLM managed land, state land, and private land in California. As of January 2010, there were 244 proposed renewable energy projects in California in various stages of the environmental review process or under construction. As of December 2009, 49 of these projects, representing approximately 10,500 MW, were planning on requesting American Recovery and Reinvestment Act (ARRA) funds from the federal government. Solar, wind, and geothermal development applications have requested use of BLM

land, including approximately one million acres of the California desert. State and private lands have also been targeted for renewable solar and wind projects.

Figure 3.18-1 and Table 3.18-1 illustrate the numerous proposed renewable energy projects (solar and wind) on BLM land in the California Desert District. In particular, solar and wind development applications for use of BLM land (excluding state and private land) have been submitted for approximately one million acres of the California Desert Conservation Area.

Table 3.18-1
Renewable Energy Projects on BLM Land in the California Desert District

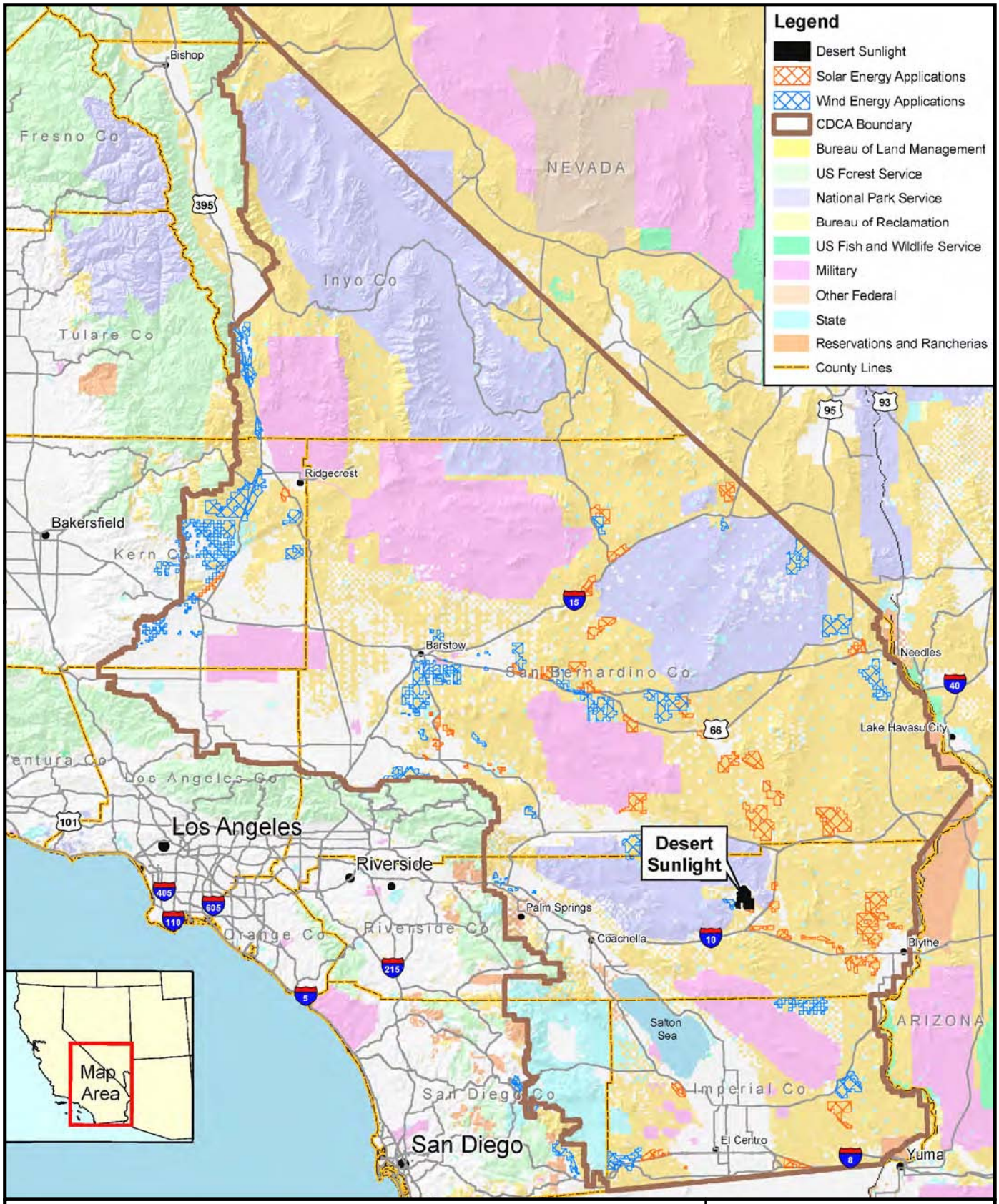
BLM Field Office	Number of Projects & Acres	Total MW
	Solar Energy	
Barstow Field Office	18 projects 132,560 acres	12,875 MW
El Centro Field Office	7 projects 50,707 acres	3,950 MW
Needles Field Office	17 projects 230,480 acres	15,700 MW
Palm Springs Field Office	17 projects 123,592 acres	11,873 MW
Ridgecrest Field Office	4 projects 30,543 acres	2,835 MW
TOTAL – CA Desert District	63 projects 567,882 acres	47,233 MW
	Wind Energy	
Barstow Field Office	25 projects 171,560 acres	N/A
El Centro Field Office	9 projects (acreage not given for 3 of the projects) 48,001 acres	N/A
Needles Field Office	8 projects 115,233 acres	N/A
Palm Springs Field Office	4 projects 5,851 acres	N/A
Ridgecrest Field Office	16 projects 123,379 acres	N/A
TOTAL – CA Desert District	62 projects 433,721 acres	N/A

Source: Renewable Energy Projects in the California Desert Conservation Area identifies solar and wind renewable projects as listed on the BLM California Desert District Alternative Energy Website (BLM 2010b)

Likelihood of Development

The large renewable energy projects now described in applications to the BLM and on private land are competing for utility Power Purchase Agreements, which will allow utilities to meet state-required Renewable Portfolio Standards. Not all of the projects listed in Table 3.18-1 will complete the environmental review, and not all projects that do complete environmental review will be funded and constructed. It is thus unlikely that all of these projects will be constructed for the following reasons:

X:\GIS\Desert_Sunlight\MXD_Files\Solar_Projects.mxd



Source: BLM, 2010.

0 20 40
Miles

DESERT SUNLIGHT SOLAR FARM

Figure 3.18-1

Overview of Regional Renewable Energy Applications

- Not all developers will develop the detailed information necessary to meet BLM and California Energy Commission standards. Most of the solar projects with pending applications are proposing generation technologies that have not been implemented at large scales. As a result, preparing complete and detailed plans of development (PODs) is difficult, and completing the required NEPA and CEQA documents is especially time-consuming and costly.
- As part of approval by the appropriate Lead Agency under NEPA or CEQA (generally the BLM or the Energy Commission), all regulatory permits must be obtained by the applicant or the prescriptions required by the regulatory authorities incorporated into the Lead Agency's license, permit or right-of-way grant. The large size of these projects may result in permitting challenges related to endangered species, mitigation measures or requirements, and other issues.
- After project approval, construction financing must be obtained (if it has not been obtained earlier in the process). The availability of financing will depend on the status of competing projects, the laws and regulations related to renewable project investment, and the time required for obtaining permits.

Incentives for Renewable Energy Development

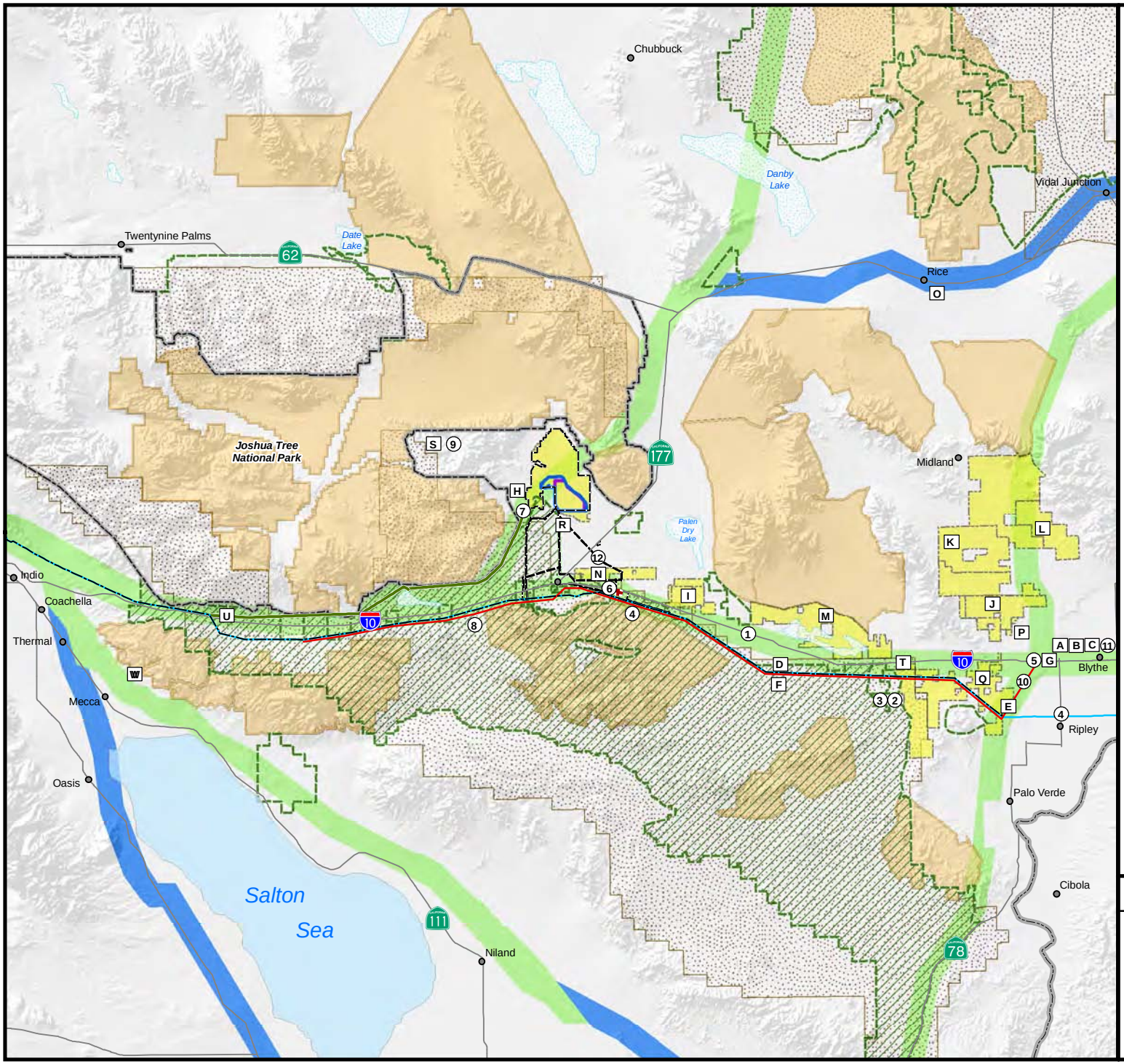
A number of existing policies and incentives encourage renewable energy development. These incentives lead to a greater number of renewable energy proposals. *Incentives for renewable energy projects include:*

- US Treasury Department's Payments for Specified Energy Property in Lieu of Tax Credits under §1603 of the American Recovery and Reinvestment Act of 2009 (Public Law 111-5)—Offers a grant (in lieu of investment tax credit) to receive funding for 30 percent of the total eligible capital cost when a project begins commercial operation (currently applies to projects that begin construction by December 31, 2010 and begin commercial operation before January 1, 2017).
- US Department of Energy (DOE) Loan Guarantee Program pursuant to §1703 of Title XVII of the Energy Policy Act of 2005—Offers a loan guarantee that is also a low interest loan to finance up to 80 percent of the capital cost at an interest rate much lower than conventional financing. The lower interest rate can reduce the cost of financing and the gross project cost on the order of several hundred million dollars over the life of the project.
- *Section 1705 of Title XVII of the Energy Policy Act of 2005, as amended by §406 of the American Recovery and Reinvestment Act of 2009—Authorized a new program for rapid deployment of renewable energy projects and related manufacturing facilities, electric power transmission projects, and leading edge biofuels projects that commence construction before September 30, 2011.*

Other Projects in Eastern Riverside County

Figure 3.18-2, Table 3.18-2 and Table 3.18-3 define the projects in the immediate vicinity of the I-10 corridor. The area included on these tables consists of a 15- to 20-mile radius around the Project site. Table 3.18-2 identifies existing projects and Table 3.18-3 identifies future foreseeable projects. The locations of all projects in these tables are shown on Figure 3.18-2.

X:\GIS\Desert_Sunlight\MXD_Files\Cumulative_Vicinity.mxd



0 12

Miles

LEGEND

- Desert Sunlight Study Area Boundary
- Solar Farm Boundary (Alternative B)
- Solar Farm Boundary (Alternative C)
- Joshua Tree National Park Boundary
- Area of Critical Environmental Concern (ACEC)
- Chuckwalla DWMA
- BLM Wilderness Area
- Desert Tortoise Critical Habitat Boundary

PROJECTS

- Blythe Energy Project Transmission Line
- Devers-Palo Verde Transmission Line (DPV1)
- DPV 2 and Desert Southwest Transmission Line
- Green Energy Express Transmission Line
- BLM Solar ROW Application
- (5) Existing Projects (Table 3.18-2)
- [A] Proposed Projects (Table 3.18-3)

BLM Utility Corridor

- Designated Corridor
- Contingent Corridor

Source: California Energy Commission, 2010.
BLM, 2010.

Riverside County, 2010

DESERT SUNLIGHT SOLAR FARM

Figure 3.18-2

Cumulative Projects in the Project Area

Table 3.18-2
Existing Projects along the I-10 Corridor (Eastern Riverside County)

ID # on Figure 3.18-2	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
1	Interstate 10	Linear *interstate highway* running from Santa Monica to Blythe (in California)	Caltrans	Existing	N/A	Interstate 10 (I-10) is a major east-west route for trucks delivering goods to and from California. It is a four-lane divided highway in the project region.
2	Chuckwalla Valley State Prison	19025 Wiley's Well Rd. Blythe, CA	CA Dept. of Corrections & Rehabilitation	Existing	1,080	State prison providing long-term housing and services for male felons classified as medium and low-medium custody inmates jointly located on 1,720 acres of state-owned property. APN 879040006, 008, 012, 027, 028, 029, 030
3	Ironwood State Prison	19005 Wiley's Well Rd. Blythe, CA	CA Dept. of Corrections & Rehabilitation	Existing	640	ISP jointly occupies with Chuckwalla Valley State Prison 1,720 acres of state-owned property, of which ISP encompasses 640 acres. The prison complex occupies approximately 350 acres with the remaining acreage used for erosion control, drainage ditches, and catch basins. *APNs* 879-040-001, 004, 009, 010, 011, 015, 016, 017, 018, 019, 020
4	Devers-Palo Verde 1 Transmission Line	From *Palo Verde (Arizona)* to Devers Substation	SCE	Existing	N/A	Existing 500 kV transmission line parallel to I-10 from *Arizona* to the SCE Devers Substation, near Palm Springs. *DPV1 will loop into the approved Midpoint Substation (now called Colorado River Substation), which will be located 10 miles southwest of Blythe. See D and E in Table 3.18-3.*
5	Blythe Energy Project	City of Blythe, north of I-10, 7 miles west of the CA /AZ border	Blythe Energy, LLC	Existing	76	520 MW combined-cycle natural gas-fired electric-generating facility. Project is connected to the Buck Substation owned by WAPA.
6	West-wide Section 368 Energy Corridors	Riverside County, parallel to DPV corridor	BLM, DOE, US Forest Service	Approved by BLM and US Forest Service	N/A	Designation of corridors on federal land in the 11 western states, including California, for oil, gas, and hydrogen pipelines and electricity transmission and distribution facilities (energy corridors). One of the corridors runs along the southern portion of Riverside County.

Table 3.18-2 (continued)
Existing Projects along the I-10 Corridor (Eastern Riverside County)

ID # on Figure 3.18-2	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
7	Eagle Mountain Pumping Plant	Eagle Mountain Road, west of Desert Center	Metropolitan Water District of Southern California	Existing		144-foot pumping plant that is part of the Metropolitan Water District of Southern California's facilities. APNs 807-150-007, 807-150-009, 807-150-010
8	Recreational Opportunities	Eastern Riverside County	BLM	Existing	N/A	BLM has numerous recreational opportunities on lands in eastern Riverside County along the I-10 corridor including the Wiley's Well Campground, Coon Hollow Campground, and Midland Long-Term Visitor Area.
9	Kaiser Mine	Eagle Mountain, north of Desert Center	Kaiser Ventures, Inc.	*Existing*		Kaiser Steel mined iron ore at Kaiser Mine in Eagle Mountain and provided much of the Pacific Coast steel in the 1950s. Mining project also included the Eagle Mountain Railroad, 51 miles long. Imported steel captured market share in the 1960s and 1970s and primary steelmaking closed in the 1980s. 701380031
10	Blythe Energy Project Trans-mission Line	From the Blythe Energy Project (Blythe, CA) to *Julian Hinds* Substation	Blythe Energy, LLC	*Existing*	N/A	Transmission line modifications including upgrades to Buck Substation, approximately 67.4 miles of new 230 kV transmission line between Buck Substation and Julian Hinds Substation, upgrades to the Julian Hinds Substation, installation of 6.7 miles of new 230 kV transmission line between Buck Substation and SCE's DPV 500 kV transmission line.
11	*Blythe PV Project*	*Blythe*	*First Solar*	*CPUC approved project terms of a 20 year power purchase agreement for sale of 7.5 MW, Under construction in fourth quarter, 2009*	*200*	*7.5 MW solar photovoltaic project located on 200 acres. Project was constructed by First Solar and sold to NRG Energy.*
12	*Chuckwalla Valley Raceway*	*Desert Center Airport (no longer a community airport)*	*Developer Matt Johnson*	*Existing*	*400*	*Proposed 500-mile race track located on 400 acres of land that used to belong to Riverside County and was used as the Desert Center Airport. APNs 811-142-016, 811-142-006. Small private airstrip kept as part of project. Construction completed in March 2010.*

Table 3.18-3
Future Foreseeable Projects along the I-10 Corridor (Eastern Riverside County)

ID # on Figure 3.18-2	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
A	Four Commercial Projects	Blythe, CA	Various	Approved	N/A	Four commercial projects have been approved by the Blythe Planning Department including the Agate Road Boat & RV Storage, Riverway Ranch Specific Plan, Subway Restaurant and Motel, and Agate Senior Housing Development.
B	Intake Shell	Blythe, CA		Under Construction	N/A	Reconstruction of a Shell facility located at Intake & Hobson Way. Demolition occurred in 2008, reconstruction planned for 2009-2010.
C	Fifteen residential developments	Blythe, CA	Various	Approved or Under Construction	N/A	Twelve residential development projects have been approved by the Blythe Planning Department including: Vista Palo Verde (83 Single Family Residential [SFR]), Van Weelden (184 SFR), Sonora South (43 SFR), Ranchette Estates (20 SFR), Irvine Assets (107 SFR), Chanslor Village (79 SFR), St. Joseph's Investments (69 SFR), Edgewater Lane (SFR), The Chanslor Place Phase IV (57 SFR), Cottonwood Meadows (103 Attached SFR), Palo Verde Oasis Phase IV (29 SFR). Three residential development projects have been approved and are under construction including: The Chanslor Phase II & III (78 SFR), River Estate at Hidden Beaches, Mesa Bluffs Villas (26 Attached SFR).
D	Devers-Palo Verde 2 Trans-mission Line Project	From the Midpoint Substation to Devers Substation *(CA-only portion)*	SCE	*CPUC Petition to Modify Request to construct CA-only portion was* approved by CPUC 11/2009. *DPV2 to Arizona was originally approved by CPUC in 6/2007. BLM ROD not yet issued.*	N/A	New 500 kV transmission line parallel to the existing Devers-Palo Verde Transmission Line from Midpoint Substation, approximately 10 miles southwest of Blythe, to the SCE Devers Substation, near Palm Springs. The ROW for the 500 kV transmission line would be adjacent to the existing DPV ROW and would require an additional 130 feet of ROW on federal and State land and at least 130 feet of ROW on private land and Indian Reservation land.
E	Colorado *River* Substation *Expansion*	10 miles southwest of Blythe	SCE	Approved by CPUC 11/2009. *Application for expansion filed with CPUC in 11/2010. Expansion currently under environmental review.*	44	The *substation was approved by the CPUC (as the "Midpoint Substation") but is proposed to be expanded as a* 500/230 kV substation *and* would be constructed in an area approximately 1,000 feet by 1,900 feet, permanently disturbing approximately *90* acres. The 500 kV switching station would include buses, circuit breakers, and disconnect switches. The switchyard would be equipped with 108-foot-high dead-end structures. Outdoor night lighting would be designed to illuminate the switchrack when manually switched on. *The Draft Supplemental EIR was published by the CPUC in February 2011.*

Table 3.18-3 (continued)
Future Foreseeable Projects along the I-10 Corridor (Eastern Riverside County)

ID # on Figure 3.18-2	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
F	Desert Southwest Trans-mission Line	118 miles primarily parallel to DPV	Imperial Irrigation District	Final EIR/EIS prepared *in* 2005. Approved by the BLM in 2006.	N/A	New, approximately 118-mile 500 kV transmission line from a new substation/switching station near the Blythe Energy Project to the existing Devers Substation located approximately 10 miles north of Palm Springs, California.
G	Blythe Energy Project II	Blythe, CA. Near the Blythe Airport and I-10	Blythe Energy, LLC	Approved *by CEC in* December 2005	30 acres (located on Blythe Energy Project land)	520 MW combined-cycle power plant located entirely within the Blythe Energy Project site boundary. Blythe Energy Project II will interconnect with the Buck Substation constructed by WAPA as part of the Blythe Energy Project. Project is designed on 30 acres of a 76-acre site.
H	Eagle Mountain Pumped Storage Project	Eagle Mountain iron ore mine, north of Desert Center	Eagle Crest Energy Company	License application filed with FERC in June 2009. *EIR published in mid- 2010; FERC Draft EIS published in December 2010*.	1,524	1,300 MW pumped storage project designed to store off-peak energy to use during peak hours. The captured off-peak energy would be used to pump water to an upper reservoir. When the water is released to a lower reservoir through an underground electrical generating facility the stored energy would be added into the Southwestern grid during "high demand peak" times, primarily weekdays. Estimated water use is 8,100 AFY for the first four-year start-up period and replacement water is 1,763 AFY thereafter.
I	Palen Solar Energy Project	North of I-10, 10 miles east of Desert Center	Solar Millennium LLC/ Chevron Energy	*Approved by CEC in December 2010. Undergoing environmental review by BLM. Proposed to have one unit online in 2012 and one unit online in 2013.*	5,200	500 MW solar trough project on 5,200 acres. Facility would consist of two 250 MW plants disturbing approximately 3,870 acres. Project would include interconnection to the SCE Red Bluff Substation. Project would use an estimated 300 AFY of water.
J	Blythe Solar Power Project	North of I-10, immediately north of the Blythe Airport	Solar Millennium LLC/Chevron Energy	*Approved by CEC and BLM in 2010; under construction.*	9,400	1,000 MW solar trough facility on 9,400 acres.
K	NextEra (FPL) McCoy	Northwest of Blythe, CA, immediately north of Blythe Solar Power Project	NextEra (FPL)	Plan of Development in to Palm Springs BLM	20,608	250 MW solar trough project. ROW in process for monitoring water well drilling.

Table 3.18-3 (continued)
Future Foreseeable Projects along the I-10 Corridor (Eastern Riverside County)

ID # on Figure 3.18-2	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
L	McCoy Soleil Project	10 miles northwest of Blythe	enXco	Plan of Development in to Palm Springs BLM	1,959	300 MW solar power tower project located on 1,959 acres. Project would require a 14-mile transmission line to proposed SCE Colorado Substation south of I-10. Would use 575-600 AFY of water.
M	Genesis Solar Energy Project	North of I-10, 25 miles west of Blythe and 27 miles east of Desert Center	NextEra (FPL)	*Approved by CEC and BLM in 2010; under construction*		250 MW solar trough project on 4,640 acres north of the Ford Dry Lake. Project includes six-mile natural gas pipeline and a 5.5-mile gen-tie line to the Blythe Energy Center to Julian Hinds Transmission Line, then travel east on shared transmission poles to the Colorado River Substation.
N	Chuckwalla Solar I	1 mile north of Desert Center	Chuckwalla Solar I, LLC	Plan of Development submitted to BLM	4,083	200 MW solar photovoltaic project on 4,083 acres. Project would be developed in several phases and would tap into an existing SCE 161-kV transmission line crossing the site.
O	Rice Solar Energy Project	Rice Valley, Eastern Riverside County	Rice Solar Energy, LLC (Solar Reserve, LLC)	*Approved by CEC; construction to begin in 2011*	1,410	150 MW solar power tower project with liquid salt storage. Project is located on approximately 1,410 acres and includes a power tower approximately 650 feet tall and a 10-mile long interconnection with the WAPA Parker-Blythe transmission line.
P	Blythe Airport Solar I Project	Blythe Airport	U.S. Solar	City of Blythe approved the project in November, 2009	640	100 MW solar photovoltaic project located on 640 acres of Blythe airport land.
Q	Desert Quartzite	South of I-10, 8 miles southwest of Blythe	First Solar (previously OptiSolar)	POD in to BLM	7,724	600 MW solar photovoltaic project located on 7,724 acres. Adjacent to DPV transmission line and SCE Colorado Substation. Approximately 27 AF of water would be used during construction and 3.8 AFY during operation.
R	Desert Harvest Project	6 miles north of Desert Center	enXco	*POD submitted to BLM*	1,057	100 MW photovoltaic plant on 1,057 acres of BLM land. Would require a 5- to 8-mile transmission line to planned SCE Red Bluff Substation.
S	Eagle Mountain Landfill Project	Eagle Mountain, North of Desert Center	Mine Reclamation Corporation and Kaiser Eagle Mountain, Inc.	US Court of Appeals for the Ninth Circuit issued its opinion regarding the EIS for the project in 11/09 and ruled that the land exchange for the project was not properly approved by	~ 3,500	The project proposed to be developed on a portion of the Kaiser Eagle Mountain Mine in Riverside County, California. The proposed project comprises a Class III nonhazardous municipal solid waste landfill and the renovation and repopulation of Eagle Mountain Townsite. The proposal by the proponent includes a land exchange and application for rights-of-way with the Bureau of Land Management and a Specific Plan, General Plan Amendment, Change of Zone, Development Agreement, Revised Permit to Reclamation Plan, and Tentative Tract Map with the County. The Eagle Mountain

Table 3.18-3 (continued)
Future Foreseeable Projects along the I-10 Corridor (Eastern Riverside County)

ID # on Figure 3.18-2	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
				the administrative agency. Kaiser's Mine and Reclamation is considering all available options.		landfill project proposes to accept up to 20,000 tons of non-hazardous solid waste per day for 50 years.
T	Wiley's Well Communi-cation Tower (part of the Public Safety Enterprise Communi-cation System)	East of Wiley's Well Road, just south of I-10	Riverside County	Final EIR for the Public Safety Enterprise Communication System published in August 2008.	N/A	The Public Safety Enterprise Communication project is the expansion of Riverside County's fire and law enforcement agencies approximately 20 communication sites to provide voice and data transmission capabilities to personnel in the field.
U	Paradise Valley "New Town" Development	Approximately 30 miles west of Desert Center (7 miles east of the city of Coachella)	Glorious Land Company	Notice of Preparation (NOP) of an EIR published in December 2005. Still under environmental review.	6,397	Company proposes to develop a planned community as an international resort destination with residential, recreational, commercial, and institutional uses and facilities. The project is planned as a self-contained community with all public and quasi-public services provided. The project is located outside the Coachella Valley Water District (CVWD) boundaries and the applicant has entered into an agreement with the CVWD to manage artificial recharge of the Shaver's Valley groundwater. The proponent has purchased a firm water supply from Rosedale-Rio Bravo Water District in Kern County. In-kind water would be transferred to the MWD that would release water from the Colorado River Aqueduct to a 38-acre percolation pond on the project site. MWD would deliver approximately 10,000 AFY to the percolation pond and over the long term, no net loss of groundwater in storage is anticipated.
V	Mecca Specific Plan	North of Salton Sea, east of community of Mecca, southeast of City of Coachella.	Mecca Group LLC	NOP of an EIR published in June 2008. Still under environmental review.	2,934	The proposed project includes 19,476 units with a mix of low-, medium- and high-density residential development. Non-residential uses include retail/commercial, mixed use, a golf course, and open space with civic uses and agricultural buffers. The Specific Plan incorporates existing residential, commercial, industrial, and civic uses with a blend of proposed low-, medium- and high-density residential and commercial land uses. The proposed General Plan Amendment and Change of Zone would be changed to Specific Plan and Specific Plan zoning.

Table 3.18-3 (continued)
Future Foreseeable Projects along the I-10 Corridor (Eastern Riverside County)

ID # on Figure 3.18-2	Project Name; Agency ID	Location	Ownership	Status	Acres	Project Description
Additional Projects Outside Cumulative Figure Boundaries or Not Analyzed in Cumulative Discussion						
W	Proposed National Monument (former Catellus Lands)	Between Joshua Tree National Park and Mojave National Preserve		In December 2009, Senator Feinstein introduced bill S.2921 that would designate two new national monuments including the Mojave Trails National Monument.	941,000	The proposed Mojave Trails National Monument would protect approximately 941,000 acres of federal land, including approximately 266,000 acres of the former railroad lands along historic Route 66. The BLM would be given the authority to conserve the monument lands and also to maintain existing recreational uses, including hunting, vehicular travel on open roads and trails, camping, horseback riding and rockhounding.
X	BLM *Solar Energy Zones (SEZs)*	Along the I-10 corridor between Desert Center and Blythe	BLM	Proposed	202,*896* (eastern Riverside County only)	The DOE and the BLM identified 24 tracts of land as Solar Energy Study Areas in the BLM and DOE Solar Programmatic *Draft* EIS, *published in December 2010.* These areas have been identified for in-depth study of solar development and may be found appropriate for designation as solar energy zones in the future.

Three projects included on Table 3.18-3 would interconnect to the SCE Red Bluff Substation, and their construction and operational impacts would occur at the same times and in the same general area as the proposed Project. These projects are separate projects that are being undertaken by different entities. However, the following provides additional, clarifying information about the description and environmental impacts of these projects and the potential for these impacts to combine with impacts of the proposed Project:

- ***Palen Solar Power Project (PSPP)**. This is a 500 MW solar trough project on 5,200 acres, about seven miles south of the Desert Sunlight project and about two miles north of the Red Bluff Substation. It would consist of two adjacent 250 MW plants disturbing approximately 3,870 acres. PSPP would interconnect to the SCE Red Bluff Substation; the gen-tie is evaluated in its CEQA document. It would use an estimated 300 AFY of water. Impacts of this project were defined by the California Energy Commission, which approved the project in December 2010 (CEC, 2010; see Commission Decision CEC-800-2010-010 CMF, Docket Number 09-AFC-07). As defined in that Decision, the significant and unmitigable impacts of the PSPP were defined by the CEC as follows:*
    - ***Cultural Resources**. The project may permanently change and/or result in the destruction of cultural resources, both known and as yet unknown, contributing to a cumulatively considerable impact which will be mitigated to the extent possible, but may not be fully mitigated.*
    - ***Land Use**. The CEC's decision states that the contribution of PSPP to the loss of desert lands, in combination with the other renewable energy projects proposed in the region (including Desert Sunlight and the Red Bluff Substation), would be cumulatively significant. Lands formerly available for multiple uses—habitat, open space, grazing, and recreation—would no longer be available for those uses once a power plant is constructed.*
    - ***Visual Resources**. PSPP would result in the installation of a large, industrial facility in the I-10 corridor. The CEC defined significant visual impacts from several Key Observation Points in the Chuckwalla Valley, the Palen McCoy Wilderness, and along I-10. A significant cumulative impact to visual resources in eastern Riverside County was identified from the combination of PSPP and other existing and proposed energy projects including the Desert Sunlight and Red Bluff Substation projects. The PSPP transmission line would also result in a substantial contribution to cumulative visual impacts in the context of existing cumulative conditions. PSPP's contribution to visible industrialization of the desert landscape also constitutes a substantial contribution to a significant visual impact when considering existing and foreseeable projects, both within the immediate project viewshed and in a broader context encompassing the whole of the I-10 corridor.*
- ***enXco Desert Harvest Solar Project**. This 100 MW photovoltaic plant is proposed on 1,057 acres of BLM-administered land (BLM Application CACA 049491). It would require a five- to eight-mile gen-tie line to connect to the SCE Red Bluff Substation. This project has not yet been evaluated under NEPA or CEQA. The impacts would be similar to those of the Desert Sunlight project, as disclosed in this EIS, but since its ground disturbance would be about one-quarter of the size of that project, most impacts would be reduced proportionally.*
- ***Eagle Mountain Pumped Storage Project:** On June 22, 2009, Eagle Crest Energy Company filed an application for an original license with the Federal Energy Regulatory Commission (FERC) for the proposed Eagle Mountain Pumped Storage Hydroelectric Project, which would be located on the site of the inactive Eagle Mountain mine, in Riverside County, California, near the town of Desert Center. The project would occupy 1,059 acres of federal lands administered by BLM and 1,162 acres of private lands owned by Kaiser Eagle Mountain, LLC. The power generated at Eagle Mountain would be transmitted to the electric*

grid via the Red Bluff Substation. The estimated annual production from the proposed project would be a maximum of 4,308 gigawatt-hours of on-peak generation. According to the Draft EIS published by the Federal Energy Regulatory Commission in December 2010 (FERC, 2010), the primary environmental issues associated with licensing the project are the effects from construction and operation on groundwater, water quality, and terrestrial species, including several state sensitive bat species, the BLM sensitive desert bighorn sheep, and the threatened desert tortoise.