BEFORE THE PUBLIC UTILITIES COMMISSION OF THE

STATE OF CALIFORNIA

In the Matter of the Application of SOUTHERN CALIFORNIA EDISON COMPANY (U-338-E) for a Certificate of Public Convenience and Necessity Concerning the Eldorado-Ivanpah 220 kV Transmission Project	)))))	Application No. _____ (Filed May 28, 2009)

PROPONENT'S ENVIRONMENTAL ASSESSMENT ELDORADO-IVANPAH 220 KV TRANSMISSION PROJECT VOLUME 1

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Dated: May 28, 2009

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

ES.1 PURPOSE OF THE PROPOSED PROJECT

As part of the Renewable Energy Transmission Initiative, the Ivanpah Dry Lake Area in the Eastern Mojave Desert area has been identified to be a rich solar resource area in the State of California. The Ivanpah Dry Lake Area is mostly under the jurisdiction of the Bureau of Land Management. The construction of new transmission lines and facilities will be required to tap this potential solar resource. These new transmission lines and facilities, together with existing facilities, will be used to deliver the power produced from the Ivanpah Dry Lake Area to utility load centers.

Southern California Edison Company (SCE) is proposing to construct the Eldorado-Ivanpah Transmission Project (Proposed Project or Project) for the purpose of providing the electrical facilities necessary to integrate up to 1,400 megawatts (MW) of new solar generation in the Ivanpah Dry Lake Area. The Proposed Project (Figure ES-1) consists of the construction of a new approximately 35-mile double-circuit 220 kilovolt (kV) transmission line between the Ivanpah Dry Lake Area and the existing Eldorado Substation, a new Ivanpah 220/115kV Substation, and a telecommunication system.

ES.2 PROJECT NEED

The Proposed Project is needed to:

1. Comply with the state-mandated Renewables Portfolio Standard (RPS) (i.e., 20 percent renewable by year 2010 per California Senate Bill 107[1]) in an orderly, rational, and cost-effective manner, while also considering the need for maintaining reliable electric service during the upgrade and/or construction of new facilities

2. Integrate planned renewable generation resources[2], including up to 1,400 MW from the Ivanpah Dry Lake Area with a Power Purchase Agreement executed by a California Public Utilities Commission jurisdictional Private Transmission Owners, in a manner that minimizes potential environmental impacts and impacts to existing and planned residences, where feasible, by maximizing the use of existing transmission corridors in order to:
   a) maximize the use of existing, previously disturbed transmission line right-of-way (ROW) to minimize effect on previously undisturbed land and resources
   b) select route and tower locations with the lowest potential for environmental impacts while still meeting Project objectives
   c) select the shortest feasible route that minimizes environmental impacts and Project costs

[1] SB 107; Chapter 464, Statutes of 2006. SB 107 amends pertinent provisions in Public Resources Code Sections 25740 through 25751 and Public Utilities Code Sections 399.11 through 399.16.

[2] Under Sections 210 and 212 of the Federal Power Act (16 U.S.C § 824 (i) and (k)) and Sections 24 and 25 of the California Independent System Operator's (CAISO) Tariff, SCE is obligated to interconnect and integrate power generation facilities into its electric system.

3. Meet the transmission reliability needs of the SCE-owned and CAISO-controlled transmission grid in the eastern Mojave Desert area, resulting from projected load growth in the Los Angeles area

4. Interconnect and deliver energy from up to 1,400 MW of renewable and non-renewable resources located in the eastern Mojave Desert area in a way that complies with all applicable North American Electric Reliability Corporation (NERC)/Western Electricity Coordinating Council (WECC) Planning Standards, and in a manner that minimizes transmission line crossings

5. Support the State of California Greenhouse Gas Reduction Program

6. Support the Federal Energy Mandate

    - Executive Order 13212, Actions to Expedite Energy-Related Projects, requires federal agencies to expedite review of energy project applications

    - The Energy Policy Act of 2005 (Title II, Sec. 211) requires the Department of Interior to approve at least 10,000 MW of renewable energy on public lands by 2015

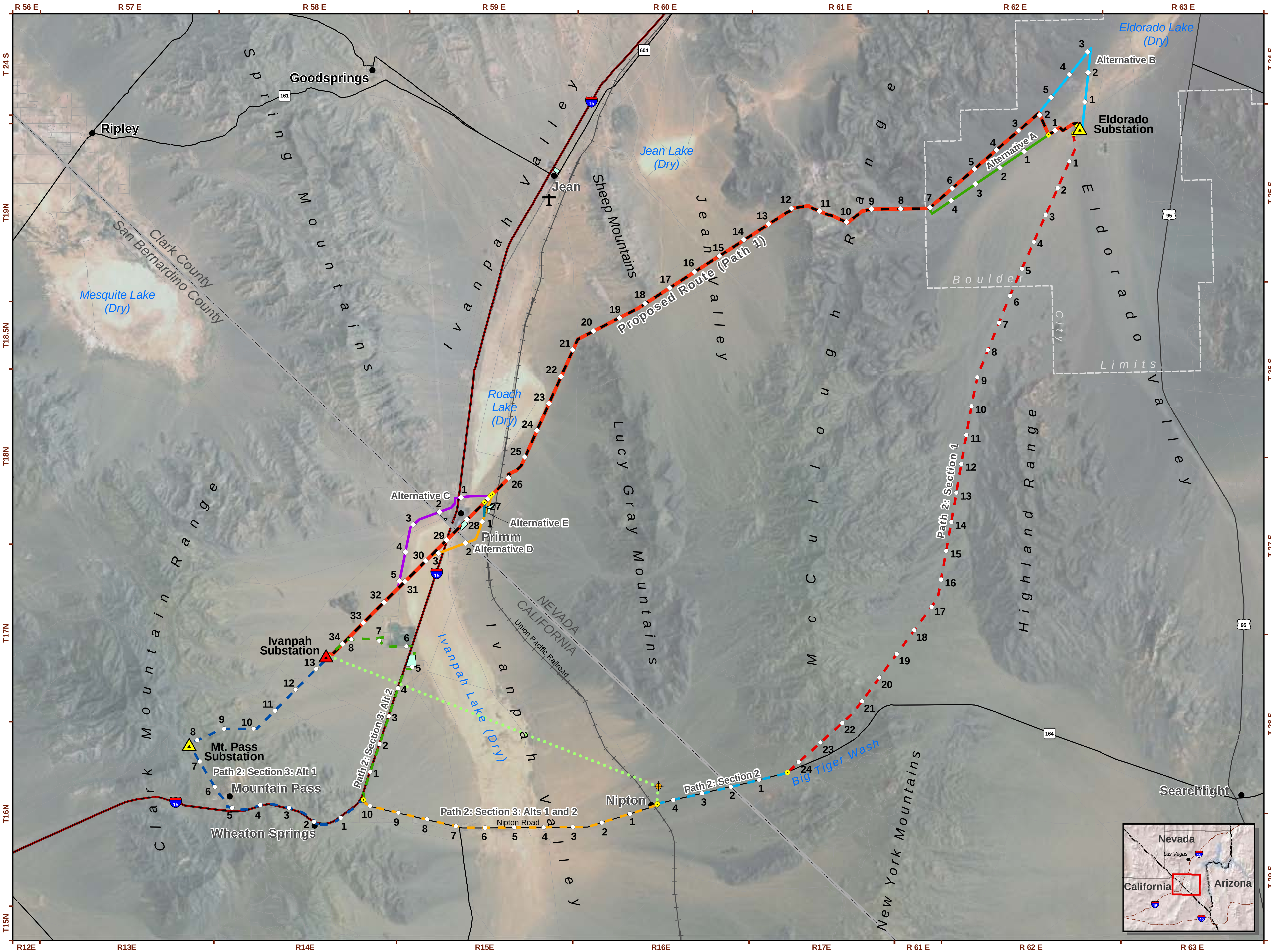
ES.3 PROJECT OBJECTIVES

The California Environmental Quality Act (CEQA) and the CEQA Guidelines (Section 15126.6[a]) require the consideration of a reasonable range of alternatives to a proposed project, or the location of a proposed project that would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project. CEQA Guidelines (Section 15124[b]) require that the statement of objectives sought to be achieved by the project include the underlying purpose of the project. In addition to the purposes described in the Section ES.1 above, SCE has identified the following objectives for meeting the Proposed Project's purpose and need described in this chapter:

1. Reliably interconnect new solar generation resources in the Ivanpah Dry Lake Area and help enable SCE and other California utilities to comply with California's RPS in an expedited manner

2. Comply with all applicable reliability planning criteria required by NERC, WECC, and the CAISO

3. Construct facilities in an orderly, rational, and cost-effective manner to maintain reliable electric service, by minimizing service interruptions during construction;



Eldorado-Ivanpah Transmission Project

Project Overview

Figure ES-1

Legend

220 kV Transmission Line

- Proposed Route
- Alternative A
- Alternative B
- Alternative C
- Alternative D
- Alternative E
- Milepost (Numbered)
- Milepost 0 (Next Line)

Telecommunications Facilities

- Path 1
- Path 2: Section 1
- Path 2: Section 2
- Path 2: Section 3: Alt 1
- Path 2: Section 3: Alt 2
- Path 2: Section 3: Alts 1 and 2
- Path 2: Section 3A: MW Route
- Milepost (Numbered)
- Milepost 0 (Next Line)

Utilities

- Exisiting Substation
- Proposed Substation
- Nipton Microwave
- Laydown Area

Reference Features

- City/Town
- Airfield
- Interstate Highway
- State/Other Highway
- Local Road
- Railroad

Sources: USGS, 2004, 2005, 2006, 2008; Clark County Comprehensive Planning, 2007; SCE, 2006, 2008; FEMA,1996; BLM, 1998, 2005, 2006; EPG, 2008; Global Energy Divisions LLC, 2006; ESRI ArcGIS Online Shaded Relief World, 2008

Scale = 1:200,000

0 0.5 1 2 3 4
Miles

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4. Maximize the use of existing transmission line ROWs in order to minimize effects on previously undisturbed land and resources[3]

5. Minimize environmental impacts through selection of routes, tower types, and locations

6. Where existing ROW is not available, utilize the shortest feasible route that minimizes environmental impacts

7. Meet Project needs in a cost-effective and timely manner

These objectives guide SCE in developing a range of reasonable alternatives to the Project, or to the location of the project, which would feasibly attain most of the basic Project objectives.

ES.4 SUMMARY OF PROPOSED PROJECT

To interconnect the new planned generation resources, SCE needs to develop new and upgraded transmission facilities into the areas where the generation resources are to be located because insufficient transmission capability currently exists in these areas. Furthermore, to transmit the electrical power from these new planned generation resources to areas of electrical load or demand, SCE needs to develop and maintain a reliable transmission network with adequate capacity. The facilities needed to interconnect and transmit the electrical power from the new planned generation resources have been identified through System Impact and Facilities Studies performed as mandated by the CAISO Large Generator Interconnection Procedures. The major components of these facilities are summarized below with complete descriptions provided in Section 3. The Proposed Project's major components are shown in Figure ES-1. Proposed Project summary information is listed in Table ES-1.

ES.4.1 Substations

- Construction of a new 220/115kV substation (Ivanpah) to serve as a collector hub for the solar generation projects identified in the Ivanpah Dry Lake Area. The substation will be designed to allow up to four 220/115kV transformer banks (three are initially required to support 115kV level interconnection requests) and will provide 220kV expandability to support 220kV voltage level generation tie-lines as well as future 220kV network transmission lines (if and when required).

- Install two new 220kV positions at Eldorado Substation to support connection of new transmission lines. Upgrade existing 220kV switchrack and 500kV series capacitor equipment.

[3] See Garamendi Principles (Senate Bill 2431, Stats. 1988, Ch. 1457) regarding state transmission siting policies, including: (1) encourage the use of existing rights-of-way by upgrading existing transmission facilities where technically and economically justifiable; (2) when construction of new transmission lines is required, encourage expansion of existing right-of-way, when technically and economically feasible; (3) provide for the creation of new rights-of-way when justified by environmental, technical, or economic reasons as determined by the appropriate licensing agency; (4) where there is a need to construct additional transmission capacity seek agreement among all interested utilities on the efficient use of that capacity.

- Removal of an existing 220/115kV transformer bank at Eldorado Substation.

ES.4.2 Transmission and Telecommunication

- Removal of approximately 35 miles of a portion of the Eldorado leg of the existing Eldorado-Baker-Cool Water-Dunn Siding-Mountain Pass 115kV line (the existing 115kV infrastructure cannot support transmission of greater capacity).

- Construction of a new approximately 35-mile double-circuit 220kV transmission line with bundled 1590 aluminum conductor steel reinforced conductor, including optical ground wire to support a special protection system (SPS). The new double circuit 220kV line would be constructed in mostly existing ROW with some minor rerouting for technical and environmental reasons.

- A new approximately 1-mile portion of the existing Baker-Cool Water-Dunn Siding-Mountain Pass 115kV line connecting to the proposed Ivanpah Substation.

- Second telecommunication route to support WECC redundant telecommunication requirements for an SPS. The route consists of approximately 25-miles of optical ground wire installed on the existing Eldorado-Lugo 500kV line, 5-miles underground fiber optic cable in Hwy 164 and microwave radio from near the town of Nipton to the proposed Ivanpah Substation.

It should be noted that the use of 220kV double-circuit design specifications for the new construction is prudent and recommended to maximize capability of limited transmission corridors. This will minimize environmental impacts, maximize use of existing transmission line ROW, and avoid significant waste associated with multiple tear-down and rebuild construction activities. Furthermore, the use of double-circuit 220kV design specification for this Project will achieve the most efficient use of land for energy within the existing transmission corridor.

ES.5 ALTERNATIVES TO THE PROPOSED PROJECT

ES.5.1 Overview

Alternatives to the Proposed Project were developed and evaluated based on the Project objectives, purpose, and need. As summarized in Section ES.2, the purpose of the proposed Eldorado-Ivanpah Transmission Project is to provide the electrical facilities necessary to integrate levels of new solar generation.

ES.5.2 System Alternatives

System alternatives considered eliminated include: (1) non-transmission alternatives, such as in-basin generation of electricity or implementation of demand-side management and energy efficiency programs; (2) reconductoring of the existing 115kV Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line between the Ivanpah Dry Lake area and the existing Eldorado Substation; (3) construction of a new 115kV transmission line between the Ivanpah Dry Lake area and the existing Eldorado Substation; (4) construction of a new 220kV transmission line between the Ivanpah Dry Lake area and the existing Eldorado Substation; and (5) construction of new 500kV transmission facilities between the Ivanpah Dry Lakes area and the Eldorado Substation. System alternatives were eliminated from further consideration (refer to Section 2.4.2.1 for detailed information).

ES.5.3 Technology Alternatives

Technology alternatives considered include composite core conductor, painted transmission structures versus galvanized structures, overhead construction versus undergrounding transmission lines, and single-circuit or double-circuit transmission lines. Technologies were evaluated based on their feasibility, cost, reliability, and environmental impacts (refer to Section 2.4.2.2 for detailed information).

ES.5.4 Routing Alternatives

Routing alternatives considered include: (1) using the existing 115kV ROW by removing the existing Eldorado-Ivanpah portion of the existing Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line and replacing it with a new 220kV transmission line on an expanded ROW where the new line must cross over existing lines; (2) same as the first alternative, but eliminates several difficult crossovers of existing transmission lines by routing the proposed line adjacent to the existing City of Los Angeles Department of Water and Power (LADWP) corridor from the McCullough Pass area to the Eldorado Substation or adjacent to a LADWP ROW only near the Eldorado Substation; (3) a route on a new ROW north of the Ivanpah Dry Lake, southerly across the Dry Lake and through the town of Primm; and (4) a route on a new ROW from the existing 115kV ROW near Ivanpah Dry Lake, then easterly and southerly adjacent to an existing LADWP ROW, then rejoining the SCE ROW to a new ROW south of Primm.

Alternative Route 1 was selected since an existing access road can be used for the entire length of the line, minimizing environmental impact caused by construction of the Proposed Project. There are no significant environmental sensitivities along the proposed route that could be avoided by an alternative route. Therefore, no other alternative routes were evaluated for environmental reasons. The Proposed Project area contains a large number of existing transmission lines. The proposed route crosses several of these lines and passes through areas of line congestion. Five alternate route segments were identified where it appeared that the proposed line may not be able to pass over an existing line and may have to be rerouted to facilitate line crossing. Refer to Section 2.4.1.3 for detailed information.

ES.5.5 No Project Alternative

Under the No Project Alternative, there would be no facility upgrades or other changes to SCE's electric transmission system. The Eldorado-Ivanpah Transmission Project, including new and upgraded transmission lines and substations, would not be constructed (refer to Section 2.4.3 for detailed information).

ES.6 ENVIRONMENTAL IMPACTS AND MITIGATION

ES.6.1 Introduction

The impact findings for the proposed Eldorado-Ivanpah Transmission Project, including a listing of potentially significant impacts, applicant proposed measures (APM), proposed mitigation measures, and residual impact findings, are presented by resource topic and CEQA significance criteria in Table ES-2. The completed CEQA Checklist is presented in Appendix A. Proponent's Environmental Assessment (PEA) Section 4.0 (Environmental Setting, Impacts, and Mitigation) and PEA Appendix A addresses the following topics:

- Aesthetic Resources
- Agricultural Resources
- Air Quality
- Biological Resources
- Cultural and Paleontological Resources
- Geology, Mineral Resources, and Soils
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation and Traffic
- Utilities and Service Systems

A summary of key impact findings, by applicable environmental topics, follows.

ES.6.2 Summary of Key Impact Findings

With implementation of the specified APMs and proposed mitigation measures, no unavoidable significant impacts were identified. With implementation of APMs and proposed mitigation measures, potential impacts associated with construction and operation of the proposed Eldorado-Ivanpah Transmission Project for all environmental resource topics are considered to be less than significant.

ES.7 COMPARISON OF PROPOSED PROJECT AND ALTERNATIVES

ES.7.1 Introduction

Alternatives to the Proposed Project were developed and evaluated based on the Project objectives, purpose, and need. The primary purpose of the proposed Eldorado-Ivanpah Transmission Project is to provide the electrical facilities necessary to transmit new solar generation in the eastern Mojave Desert area. SCE's Eldorado-Ivanpah Transmission Project includes new and upgraded high-voltage electric transmission lines and a substation to deliver electricity from new solar facilities, planned by independent power producers, in eastern Mojave Desert to the Los Angeles Basin.

Selection of alternatives either for further evaluation or elimination was based on their ability to meet the purpose and need in a manner that was consistent with the Project objectives, including engineering feasibility, cost effectiveness, and minimization of environmental impacts. The range of alternatives initially considered included: (1) system alternatives; (2) technology alternatives; and (3) routing/siting alternatives. Alternatives eliminated from further consideration are discussed in Section 2.4.2 of the PEA.

ES.7.2 Alternatives Retained for Consideration

The five alternative routes that were retained for further consideration are transmission alternatives that would allow the new 220kV transmission line to cross over existing transmission lines in the area. The 220kV line is proposed to be constructed in an existing ROW, replacing a segment of the existing Eldorado-Baker-Coolwater-Dunn-Siding-Mountain Pass 115kV transmission line. Existing access roads would be used, minimizing impact to the environment. Therefore, no other alternative route was studied from an environmental perspective.

ES.8 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The No Project Alternative would result in the fewest environmental effects. Under the No Project Alternative, there would be no facility upgrades or other changes to SCE's electric transmission system. However, the No Project Alternative would not meet the Project purpose and need and/or objectives (refer to Section 1.1 for more information). The proposed Eldorado-Ivanpah Transmission Project is considered by SCE to be the most feasible and cost-effective method of meeting the Project purpose, need, and objectives with minimal environmental impacts. The Eldorado-Ivanpah Transmission Project routed on the proposed route (Figure ES-1) is considered to be the environmentally superior alternative.

TABLE ES-1 PROPOSED PROJECT SUMMARY INFORMATION ELDORADO-IVANPAH TRANSMISSION PROJECT[4]
Overall Project Construction
The operating date is July 2013 based on a conventional licensing process. Construction is scheduled to commence the last quarter of 2011 and take approximately 19 months to complete. To facilitate renewable interconnections, efforts will be made to accelerate the operating date through shorter agency decision time and compressed procurement and construction schedules.
Construction work would comply with local noise ordinances.
A total workforce of approximately 450 persons, with a daily average workforce of approximately 185 persons.
Disturbance along the proposed route of approximately 448 acres, with restoration of approximately 408 acres, resulting in permanent disturbance of 40 acres.

[4] This is based on planning level assumptions and may change following completion of preliminary and final engineering, identification of field conditions, availability of labor, material, and equipment, and any environmental and permitting requirements.

TABLE ES-2
SUMMARY OF POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS,
PROPOSED MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Resource Area/CEQA Significance Criteria	APMs	Potential Impact Significance	Proposed Mitigation Measure(s)	Resulting Level of Significance
AESTHETIC RESOURCES				
Would the Project have a substantial adverse effect on a scenic vista?	None required	None	None required	No impact
Would the Project substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	None required	None	None Required	No impact
Would the Project substantially degrade the existing visual character or quality of the site and its surroundings?	APM AES-1, APM AES-2, APM AES-4, APM AES-5, APM AES-6, APM AES-7	Less than significant	None required	Less than significant
Would the Project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	APM AES-3 APM AES-8	Less than significant	None required	Less than significant
AGRICULTURAL RESOURCES				
Would the Project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency to non-agricultural use?	None required	None	None required	No impact
Would the Project conflict with existing zoning for agricultual use or a Williamson Act contract?	None required	None	None required	No impact
Would the Project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use?	None required	Less than significant	None required	Less than significant
AIR QUALITY				
Would the Project conflict with or obstruct implementation of the applicable air quality plan?	None required	Less than significant	None required	Less than significant
Would the Project violate any air quality standard or contribute substantially to an existing or projected air quality violation?	None required	Less than significant	None required	Less than significant
Would the Project result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	None required	Less than significant	None required	Less than significant
Would the Project expose sensitive receptors to substantial pollutant concentrations?	None required	Less than significant	None required	Less than significant

TABLE ES-2
SUMMARY OF POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS, PROPOSED MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Resource Area/CEQA Significance Criteria	APMs	Potential Impact Significance	Proposed Mitigation Measure(s)	Resulting Level of Significance
Would the Project create objectionable odors affecting a substantial number of people?	None required	Less than significant	None required	Less than significant
BIOLOGICAL RESOURCES				
Would the Project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-7, APM BIO-8, APM BIO-9, APM BIO-10	Potentially significant	BIO MIT-1	Less than significant
Would the Project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	APM BIO-2, APM BIO-3, APM BIO-4, APM BIO-9	Less than significant	None required	Less than significant
Would the Project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	APM BIO-3	Less than significant	None Required	Less than significant
Would the Project interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	APM BIO-1, APM BIO-5	Potentially significant	BIO MIT-2	Less than significant
Would the Project conflict with any local policies or ordinance protecting biological resources, such as a tree preservation policy or ordinance?	None required	None	None required	No impact
Would the Project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state Habitat Conservation Plan?	None required	None	None required	No impact
CULTURAL AND PALEONTOLOGICAL RESOURCES				
Would the Project cause a sustantial adverse change in the significance of a historical resource as defined in 15064.5?	APM CR-2, APM CR-3a, APM CR-3b, APM CR-4a, APM CR-4b	Less than significant	None required	Less than significant

TABLE ES-2
SUMMARY OF POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS, PROPOSED MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Resource Area/CEQA Significance Criteria	APMs	Potential Impact Significance	Proposed Mitigation Measure(s)	Resulting Level of Significance
Would the Project cause a substantial adverse change in the significance of an archaeological resource pursuant to 15064.5?	APM CR-3a, APM CR-3b, APM CR-4a, APM CR-4b	Less than significant	None required	Less than significant
Would the Project disturb any human remains, including those interred outside of formal cemeteries?	APM CR-5, APM CR-6	Less than significant	None required	Less than significant
Would the Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	APM Paleo-1, APM Paleo-2, APM Paleo-3,APM Paleo-4, APM Paleo-5, APM Paleo-6,APM Paleo-7, APM Paleo-8	Less than significant	None required	Less than significant
GEOLOGY, MINERAL RESOURCES, AND SOILS				
Would the Project expose people or structures to potential substantial adverse effects as a result of:				
(i) rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the other substantial evidence of a known fault?	APM GEO-1, APM GEO-2, APM GEO-3	Less than significant	None required	Less than significant
(ii) strong seismic ground shaking?	APM GEO-1, APM GEO-2, APM GEO-3	Less than significant	None required	Less than significant
(iii) seismic related ground failure, including liquifaction?	APM GEO-1, APM GEO-2, APM GEO-3	Less than significant	None required	Less than significant
Would the Project result in substantial soil erosion or the loss of topsoil?	APM GEO-1, APM GEO-2, APM GEO-3	Less than significant	None required	Less than significant
Would the Project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project and potentially result in a landslide, lateral spreading, subsidence, liquefaction, or collapse?	APM GEO-1	Potentially significant	MM GEO-1	Less than significant
Would the Project be located on expansive soil, creating substantial risks to life or property?	APM GEO-1	Less than significant	None required	Less than significant
Would the Project have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	APM GEO-1	Less than significant	None required	Less than significant

TABLE ES-2
SUMMARY OF POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS, PROPOSED MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Resource Area/CEQA Significance Criteria	APMs	Potential Impact Significance	Proposed Mitigation Measure(s)	Resulting Level of Significance
Would the Project result in the loss of availability of a locally important mineral resource that would be of value to the region and the residents of the state?	None required	Less than significant	None required	Less than significant
Would the Project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	None required	Less than significant	None required	Less than significant
HAZARDS AND HAZARDOUS MATERIALS				
Would the Project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	APM HAZ-2, APM HAZ-5	Less than significant	None required	Less than significant
Would the Project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release ot hazardous material into the environment?	None required	None	None required	No impact
Would the Project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school?	None required	None	None required	No impact
Would the Project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and as a result, would it create a significant hazard to the public or the environment?	APM HAZ-1	Less than significant	None required	Less than significant
For potential Project areas located within an airport land use plan or where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the Project result in a safety hazard for people residing or working in the Project Area?	None required	None	None required	No impact
For potential areas located within the vicinity of a private airstrip, would the Project result in a safety hazard for people residing or working in the Project Area?	None required	None	None required	No impact
Would the Project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	None required	None	None required	No impact
Would the Project expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildands are adjacent to urbanized areas or where residences are intermixed with wildlands?	APM HAZ-4	Less than significant	None required	Less than significant

TABLE ES-2
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Resource Area/CEQA Significance Criteria	APMs	Potential Impact Significance	Proposed Mitigation Measure(s)	Resulting Level of Significance
HYDROLOGY AND WATER QUALITY				
Would the Project violate any water quality standards or waste discharge requirements, or otherwise substantially degrade water quality?	APM W-1, APM W-2, APM W-3, APM W-4, APM W-5, APM W-8	Less than significant	None required	Less than significant
Would the Project substantially deplete groundwater supplies or interfere substantially with groundwater recharge, such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	None	None	None	No impact
Would the Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on-or off-site or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-site or off-site?	APM W-4, APM W-7	Less than significant	None	Less than significant
Would the Project create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	APM W-5, APM W-7	None	None	No impact
Would the Project place housing within a 100-year flood hazard area as mapped on a federal Flood Insurance Rate Map or other flood hazard delineation map?	None	None	None	No impact
Would the Project place within a 100-year flood hazard area structures which would impede or redirect flood flows?	None	None	None	No impact
Would the Project expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of a failure of a levee or dam?	APM W-1, APM W-5, APM W-7	Less than significant	None	Less than significant
Would the Project expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow?	None	None	None	No impact

TABLE ES-2
SUMMARY OF POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS, PROPOSED MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Resource Area/CEQA Significance Criteria	APMs	Potential Impact Significance	Proposed Mitigation Measure(s)	Resulting Level of Significance
LAND USE AND PLANNING				
Would the Project physically divide an established community?	None required	None	None required	No impact
Would the Project conflict with any applicable land use plan, policy, or regulation of an agency jurisdiction over the Project?	None required	None	None required	No impact
Would the Project conflict with any applicable Habitat Conservation Plan or Natural Community Conservation Plan?	None required	None	None required	No impact
NOISE				
Would the Project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	APM NOI-1, APM NOI-2, APM NOI-3, APM NOI-4, APM NOI-5	Less than significant	None required	Less than significant
Would the Project result in exposure to or generation of excessive groundborne noise levels?	APM NOI-6	Less than significant	None required	Less than significant
Would the Project result in a substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project?	None required	None	None required	No impact
Would the Project result in substantial temporary or periodic increase in ambient noise levels in the Project area?	APM NOI-1, APM N0I-4, APM NOI-5	Less than significant	None required	Less than significant
For potential Project areas located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public or private airport, or public/private use airport, would the Project expose people residing or working in the Project area to excessive noise levels?	None required	None	None required	No impact
For a Project within the vicinity of a private airstrip, would the Project expose people residing or working in the Project area to excessive noise levels	None required	None	None required	No impact
POPULATION AND HOUSING				
Would the Project induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	None required	Less than significant	None required	Less than significant
Would the Project displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	None required	None	None required	No impact

TABLE ES-2
SUMMARY OF POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS, PROPOSED MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Resource Area/CEQA Significance Criteria	APMs	Potential Impact Significance	Proposed Mitigation Measure(s)	Resulting Level of Significance
Would the Project displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	None required	None	None required	No impact
PUBLIC SERVICES				
Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for:				
I. Fire protection?	None required	None	None required	No impact
II. Police protection?	None required	None	None required	No impact
III. Schools?	None required	None	None required	No impact
IV. Parks?	None required	None	None required	No impact
V. Other public facilities?	None required	None	None required	No impact
RECREATION				
Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	None required	None	None required	No impact
Would the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	None required	None	None required	No impact
TRANSPORTATION AND TRAFFIC				
Would the Project cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial incease in either the number of vehicle trips, the volume to capacity ration on roads, or congestion at intersections?	APM TRA-2	Less than significant	None required	Less than significant
Would the Project exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	APM TRA-2	Less than significant	None required	Less than significant
Would the Project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	None required	None	None required	No impact

TABLE ES-2
SUMMARY OF POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS, PROPOSED MITIGATION MEASURES, AND RESULTING LEVELS OF SIGNIFICANCE

Resource Area/CEQA Significance Criteria	APMs	Potential Impact Significance	Proposed Mitigation Measure(s)	Resulting Level of Significance
Would the Project substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	APM TRA-1, APM TRA-2	None	None required	No impact
Would the Project result in inadequate emergency access?	None required	Less than significant	None required	Less than significant
Would the Project result in inadequate parking capacity?	None required	None	None required	No impact
Would the Project conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)	APM TRA-1, APM TRA-2	None	None required	No impact
UTILITIES AND SERVICE SYSTEMS				
Would the Project exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	None required	Less than significant	None required	Less than significant
Would the Project require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	None required	None	None required	No impact
Would the Project require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	None required	None	None required	No impact
Would the Project have insufficient water supplies available to serve the Project from existing entitlements and resources, or require new or expanded entitlements?	None required	Less than significant	None required	Less than significant
Would the Project result in a determination by the wastewater treatment provider, which serves or may serve the Project, that it has inadequate capacity to serve the Project's projected demand in addition to the provider's existing commitments?	None required	Less than significant	None required	Less than significant
Would the Project be served by a landfill with insufficient permitted capacity to accommodate the Project's waste disposal needs?	None required	None	None required	No impact
Would the Project not comply with federal, state, and local statutes and regulations related to solid waste?	None required	Less than significant	None required	Less than significant

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1.0 PURPOSE AND NEED

SECTION 1.0
PURPOSE AND NEED AND OBJECTIVES

1.1 PURPOSE OF THE PROPOSED PROJECT

1.1.1 Introduction

As part of Renewable Energy Transmission Initiative (RETI), the Ivanpah Dry Lake Area, mostly under Bureau of Land Management (BLM) jurisdiction, has been identified to be a rich solar resource area in the State of California. The construction of new transmission lines and facilities will be required to tap this potential solar resource. These new transmission lines and facilities, together with existing facilities, will be used to deliver the power produced from the Ivanpah Dry Lake Area to utility load centers.

The purpose of the Eldorado-Ivanpah Transmission Project (Proposed Project or Project) is to provide the electrical facilities necessary to integrate up to 1,400 megawatts (MW) of new solar generation in the Ivanpah Dry Lake Area. The Proposed Project consists of a new, approximately 35-mile double-circuit 220 kilovolt (kV) transmission line between the Ivanpah Dry Lake Area and the existing Eldorado Substation and the construction of a new Ivanpah 220/115kV Substation. As discussed below, the Proposed Project is needed to:

1. Comply with the state-mandated Renewables Portfolio Standard (RPS) (i.e., 20 percent renewable by year 2010 per California Senate Bill 107[1]) in an orderly, rational, and cost-effective manner, while also considering the need for maintaining reliable electric service during the upgrade and/or construction of new facilities

2. Integrate planned renewable generation resources[2], including up to 1,400 MW from the Ivanpah Dry Lake Area with a Power Purchase Agreement (PPA) executed by a California Public Utilities Commission (CPUC) jurisdictional Private Transmission Owners (PTO), in a manner that minimizes potential environmental impacts and impacts to existing and planned residences, where feasible, by maximizing the use of existing transmission corridors in order to:

    a) maximize the use of existing, previously disturbed transmission line right-of-way (ROW) to minimize effect on previously undisturbed land and resources

    b) select route and tower locations with the lowest potential for environmental impacts while still meeting Proposed Project objectives

    c) select the shortest feasible route that minimizes environmental impacts and Proposed Project costs

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[1] SB 107; Chapter 464, Statutes of 2006. SB 107 amends pertinent provisions in Public Resources Code Sections 25740 through 25751 and Public Utilities Code Sections 399.11 through 399.16.

[2] Under Sections 210 and 212 of the Federal Power Act (16 U.S.C § 824 [i] and [k]) and Section 25 of the California Independent System Operator's (CAISO) Tariff, Southern California Edison (SCE) is obligated to interconnect and integrate power generation facilities into its electric system.

3. Interconnect and deliver energy from up to 1,400 MW of renewable resources located in the Ivanpah Dry Lake Area in a way that complies with all applicable North American Electric Reliability Council (NERC)/Western Electric Coordinating Council (WECC) Planning Standards, and in a manner that minimizes transmission line crossings

4. Support the State of California Greenhouse Gas Reduction Program

5. Assist the BLM in meeting the federal directive to develop 10,000 MW of renewable generation[3]

1.1.2 Compliance with Renewable Portfolio Standard

The California RPS was established in 2002 by Senate Bill 1078.[4] The RPS requires investor-owned utilities, including retail sellers of electricity such as SCE, to increase their sale of electricity produced by renewable energy sources (such as wind) by at least 1 percent per year, achieving 20 percent by 2017 (at the latest). These requirements were accelerated by the passage of Senate Bill 107[5] to be consistent with the Energy Action Plan (EAP). The EAP adopted by CPUC, California Energy Commission (CEC), and the now defunct California Power Authority pledged that the agencies will accelerate RPS implementation to meet the 20 percent goal by 2010 instead of 2017. In order for investor-owned utilities (including retail sellers of electricity such as SCE) to satisfy these target goals, new transmission facilities will be required to interconnect remote areas of high renewable generation concentration. One of these remote areas is referred to as Ivanpah Dry Lake Area.

Consequently, the Proposed Project will help enable California utilities to comply with the state mandated RPS.

The CEC's 2006 Integrated Energy Policy Report (IEPR) Update Report (January 2007) encourages the development of additional transmission infrastructure to interconnect and deliver renewable resources. The IEPR Update Report identified the lack of transmission infrastructure to access remote renewable resources as the most critical barrier to meeting California's 20 percent target by 2010. Furthermore, the IEPR Update Report states that achieving the state's RPS is an essential component of California's greenhouse gas (GHG) emission reduction targets.

1.1.3 Integrate Planned Renewable Generation Resources

Under Sections 210 and 212 of the Federal Power Act (16 U.S.C § 824 [i] and [k]) and Section 25 of the CAISO's Tariff, SCE is obligated to interconnect and integrate power generation facilities into its electric system. As of April 22, 2009, there were a total of eight active

[3] Executive Order 13212, Actions to Expedite Energy-Related Projects, requires federal agencies to expedite review of energy project applications; and the Energy Policy Act of 2005 (Title II, Sec. 211) requires the Department of Interior (DOI) to approve at least 10,000 MW of renewable energy on public lands by 2015.

[4] SB1078 (Stats. 2002, Ch. 516), adding Article 16 (California RPS Program) to the CPUC § 399.11, et seq. (2004) (SB 1078).

[5] SB 107, Chapter 464, Statutes of 2006. SB 107 amends pertinent provisions in Public Resources Code Sections 25740 through 25751 and Public Utilities Code Sections 399.11 through 399.16.

interconnection requests in the Ivanpah Dry Lake Area totaling 1,677 MW of new renewable generation interconnections. SCE understands that PG&E has executed a PPA with two of the eight active projects, and SCE recently executed a PPA with one of the active projects which have a combined output in excess of 1,400 MW. An Application for Certification (AFC) with the CEC has been filed for these three projects with a PPA on August 31, 2007 (Docket 07-AFC-05). The AFC indicates that the three plants (projects) would be developed in concert, and a joint environmental assessment by the BLM and the CEC is currently underway. Consequently, the Proposed Project will enable California utilities to access renewable generation in the Ivanpah Dry Lake Area, and thus satisfy SCE's obligation to interconnect and integrate power generation facilities into the electric grid.

1.1.4 Compliance with North American Electric Reliability Council/Western Electric Coordinating Council Reliability Planning Criteria

Transmission lines must be constructed in accordance with reliability planning criteria, including criteria developed by the CAISO, WECC, and NERC. These criteria require that the potential loss of transmission lines (proposed and existing) be analyzed and the transmission system be designed to continue to function if a loss occurs. To the extent that simultaneous loss of two or more transmission lines occurs within the same transmission corridor and creates a problem with respect to system reliability, SCE must utilize acceptable mitigation measures, such as Special Protection Systems (SPS) or construction of additional facility upgrades.

1.1.5 Support California's Greenhouse Gas Reduction Program

With the recent signing of Assembly Bill 32 (Nuñez), Chapter 488, Statutes of 2006, California will embark on an ambitious program to reduce GHG emissions. The 2006 IEPR Update states that "achieving the state's Renewable Portfolio Standard goals is an essential component of California's greenhouse gas emission reduction targets."

Consequently, the Proposed Project will enable California to integrate renewable resources (such as solar) with no GHG emissions, which could help the State of California achieve GHG emissions reduction targets.

1.1.6 Support Federal Renewable Energy Mandates

Executive Order 13212, Actions to Expedite Energy-Related Projects, requires federal agencies to expedite review of energy project applications.

The Energy Policy Act of 2005 (Title II, Sec. 211) requires the Department of Interior (DOI) to approve at least 10,000 MW of renewable energy on public lands by 2015.

1.2 NEED FOR THE PROPOSED PROJECT

The Proposed Project is needed to interconnect and deliver energy from renewable resources located in the Ivanpah Dry Lake Area in a way that complies with all applicable NERC/WECC

Planning Standards. These renewable resources are being planned by independent power producers in response to the state mandated RPS. Consequently, the energy is expected to supplant energy deliveries from existing non-renewable resources.

All new interconnection requests are shown in Table 1-1. The interconnection studies conducted as mandated by the CAISO Large Generator Interconnection Procedures (LGIP) have determined that the planned additional generation interconnections would result in unacceptable thermal overload conditions on the existing Eldorado-Baker-Cool Water-Dunn Siding-Mountain Pass 115kV. In particular, these studies determined that a portion of the existing Eldorado-Baker-Cool Water-Dunn Siding-Mountain Pass 115kV (approximately 35 miles of the Eldorado leg) as well as the existing 220/115kV transformer bank at Eldorado would load beyond the maximum allowable limits under base case conditions. These findings result in the need to construct new 220kV transmission facilities from the Ivanpah Dry Lake Area to SCE's Eldorado Substation, including a new collector substation in the Ivanpah Dry Lake Area to interconnect up to 1,400 MW of new generation resources.

TABLE 1-1
IVANPAH DRY LAKE AREA
NEW GENERATION INTERCONNECTION REQUESTS

CAISO Queue Position	Type	Size (MW)
CAISO Queue #11	New Wind Project	63
CAISO Queue #131 [1]	New Solar Project	100
CAISO Queue #162 [1]	New Solar Project	114
CAISO Queue #233 [1]	New Solar Project	200
Total Continuing Under LGIP Serial Approach		**477**
[1] Currently under review at the CEC (Docket 07-AFC-05)		
CAISO Queue #163	New Solar Project	300
CAISO Queue #234	New Solar Project	400
CAISO Queue #382	New Solar Project	270
CAISO Queue #467	New Solar Project	230
Total Continuing Under Transitional Queue Cluster Approach		**1,200**
	Grand Total Interconnection Requests	**1,677**

The Proposed Project will be configured to allow for future network upgrades to further increase renewable resource integration beyond the estimated 1,400 MW Proposed Project capability as limited by CAISO double-line outage Spinning Reserve Criteria. Given that the total amount of requested interconnections (see Table 1-1) which are still active are in excess of the 1,400 MW maximum Spinning Reserve Criteria as limited by double-line outage conditions, the use of double-circuit construction instead of single-circuit is prudent and will allow for maximizing amount of power in this corridor with minimal environmental impact as potential additional facilities are installed when required beyond those described in this document. Although not part of this plan, SCE envisions potential future transmission into the Ivanpah Dry Lake Area when actual generation development exceeds the 1,400 MW capability of the Proposed Project. Such potential future transmission is anticipated to allow for full integration of the identified renewable resources with minimal impacts on the Proposed Project corridor if double-circuit design specification for the new transmission construction is implemented as part of this Proposed Project. Since the executed PPAs are less than the 1,400 MW Proposed Project capability and not all projects in the CAISO's interconnection queue are expected to materialize, justification of potential future transmission is not appropriate at this time because the need for such additional transmission is too speculative. Therefore, SCE has not included these potential additional facility upgrades as part of this Proposed Project.

1.3 PROJECT OBJECTIVES

The California Environmental Quality Act (CEQA) and the CEQA Guidelines (Section 15126.6[a]) require the consideration of a reasonable range of alternatives to a Proposed Project, or the location of a Proposed Project that would feasibly attain most of the basic objectives of the Proposed Project, but would avoid or substantially lessen any of the significant effects of the project. CEQA Guidelines (Section 15124[b]) require that the statement of objectives sought to be achieved by the Proposed Project include the underlying purpose of the Proposed Project. In addition to the purposes described in Section 1.1, SCE has identified the following objectives for meeting the Proposed Project's purpose and need described in this chapter:

1. Reliably interconnect new solar generation resources in the Ivanpah Dry Lake Area and help enable SCE and other California utilities to comply with California's RPS in an expedited manner

2. Comply with all applicable reliability planning criteria required by NERC, WECC, and the CAISO

3. Construct facilities in an orderly, rational, and cost-effective manner to maintain reliable electric service, by minimizing service interruptions, during construction

4. Maximize the use of existing transmission line ROWs in order to minimize effects on previously undisturbed land and resources[6]

5. Minimize environmental impacts through selection of routes, tower types, and locations

6. Where existing ROW is not available, use the shortest feasible route that minimizes environmental impacts

7. Meet Proposed Project needs in a cost-effective and timely manner

These objectives guide SCE in developing a range of reasonable alternatives to the Proposed Project, or to the location of the Proposed Project, which would feasibly attain most of the basic project objectives.

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[6] See Garamendi Principles (Senate Bill 2431, Stats. 1988, Ch. 1457) regarding state transmission siting policies, including: (1) encourage the use of existing ROWs by upgrading existing transmission facilities where technically and economically justifiable; (2) when construction of new transmission lines is required, encourage expansion of existing ROW, when technically and economically feasible; (3) provide for the creation of new ROWs when justified by environmental, technical, or economic reasons as determined by the appropriate licensing agency; (4) where there is a need to construct additional transmission capacity, seek agreement among all interested utilities on the efficient use of that capacity.

1.4 SUMMARY OF PROJECT

To interconnect the new planned generation resources, SCE needs to develop new and upgraded transmission facilities into the areas where the generation resources are to be located because insufficient transmission capability currently exists in these areas. Furthermore, to transmit the electrical power from these new planned generation resources to areas of electrical load or demand, SCE needs to develop and maintain a reliable transmission network with adequate capacity. The facilities needed to interconnect and transmit the electrical power from the new planned generation resources have been identified through System Impact and Facilities Studies performed as mandated by the CAISO LGIP. The major components of these facilities are summarized as follows, with a complete description provided in Section 3.

1.4.1 <u>Substations</u>

- Construction of a new 220/115kV substation (Ivanpah) to serve as a collector hub for the solar generation projects identified in the Ivanpah Dry Lake Area. The substation will be designed to allow up to four 220/115kV transformer banks (three initially required to support 115kV level interconnection requests) and will provide 220kV expandability to support 220kV voltage level generation tie-lines, as well as future 220kV network transmission lines (if and when required).

- Install two new 220kV positions at Eldorado Substation to support connection of new transmission lines. Upgrade existing 220kV switchrack and 500kV series capacitor equipment.

- Removal of an existing 220/115kV transformer bank at Eldorado.

1.4.2 <u>Transmission and Telecommunication</u>

- Removal of approximately 35 miles of a portion of the Eldorado leg of the existing Eldorado-Baker-Cool Water-Dunn Siding-Mountain Pass 115kV line (the existing 115kV infrastructure cannot support transmission of greater capacity).

- Construction of a new approximately 35-mile double-circuit 220kV transmission line with bundled 1590 aluminum conductor steel reinforced (ACSR) conductor, including optical ground wire (OPGW) to support a SPS. The new double-circuit 220kV line would be constructed in mostly existing ROW with some minor rerouting for technical and environmental reasons.

- A new approximately 1-mile portion of the existing Baker-Cool Water-Dunn Siding-Mountain Pass 115kV line connecting to the proposed Ivanpah Substation.

- Second telecommunication route to support WECC redundant telecommunication requirements for an SPS. The route consists of approximately 25-miles of optical ground wire installed on the existing Eldorado-Lugo 500kV line, 5-miles underground fiber optic cable in Hwy 164 and microwave radio from near the town of Nipton to the proposed Ivanpah Substation.

It should be noted that the use of 220kV double-circuit design specifications for the new construction is prudent and recommended to maximize capability of limited transmission corridors. This will minimize environmental impacts, maximize use of existing transmission line ROW, and avoid significant waste associated with multiple tear-down and rebuild construction activities. Furthermore, the use of double-circuit 220kV design specification for this Proposed Project will achieve the most efficient use of land for energy within the existing transmission corridor.

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2.0 ALTERNATIVES

SECTION 2.0
ALTERNATIVES TO THE PROPOSED PROJECT

2.1 INTRODUCTION

This chapter describes the process SCE used to develop the alternatives for the Proposed Project and to select the Proposed Project for recommendation to the CPUC. The chapter also provides a description of each Project alternative (including the No Project Alternative) and discusses the ability of each of these alternatives to meet Project objectives, purpose, and need. Also included is the rationale for either eliminating an alternative or carrying it forward. For purposes of describing the alternatives to the Proposed Project, this chapter considers system, technology, and routing alternatives. The CEQA does not require in-depth analysis of all Project alternatives, but specifies that a reasonable range of alternatives be considered and evaluated.

This section begins with a description of the approach to the initial routing and alternatives selection, discusses requirements of CEQA and the National Environmental Policy Act (NEPA), and then provides descriptions of alternatives eliminated and retained for evaluation in this Proponent's Environmental Assessment (PEA).

While the CAISO is responsible for providing open and non-discriminatory access to the CAISO Controlled Grid in California, the CPUC retains exclusive jurisdiction over the siting of CAISO-approved transmission projects within the State of California and is the lead agency with respect to such project elements within the State of California under CEQA. Therefore, in the Application of which this PEA is a part, SCE seeks from the CPUC a Certificate of Public Convenience and Necessity (CPCN) in accordance with CPUC General Order 131-D. The CPCN would identify the selected route for the CAISO-approved Project, based on environmental review of SCE's proposed route and alternatives thereto, as required by CEQA, and would authorize construction of the Project along the CPUC-selected route, consistent with Public Utilities Code Section 1001. This PEA includes a detailed environmental analysis of SCE's proposed route, together with other information required by CPUC rules, in order to assist the CPUC in preparing its Initial Study of the Project pursuant to CEQA. SCE will also need to file for a Use Permit from Clark County and comply with the Utility Environmental Protection Act from the Public Utility Commission of Nevada**.** Also, since most of the Project area is located on land under the jurisdiction of the BLM, SCE will need to file a ROW application and obtain a permit to construct with the BLM.

The principal Project alternatives SCE considered were:

- No Project Alternative - Transmission facilities would not be constructed
- Alternative System Configurations, including facilities of different voltage levels
- Alternative transmission line routes in the Ivanpah Dry Lake and Primm, Nevada areas.
- Alternative transmission line routes in Eldorado Substation area
- Alternative technologies including:
  - Undergrounding
  - Tower Structures
  - Composite Core Conductor

2.1.1 Summary of Southern California Edison's Findings

SCE evaluated each alternative for its ability to meet the Project objectives. Each of these alternatives differs according to environmental impacts, engineering feasibility, and cost. SCE concluded that alternatives presented in Section 2.4.1, Alternatives Evaluated in the Proponent's Environmental Assessment, would be feasible and could be implemented in an efficient and expedited manner. As discussed in Section 2.4.2, Alternatives Considered and Eliminated, the analysis determined that implementation of several of the alternatives considered would not satisfy SCE's basic Project objectives. The No Project Alternative (see Section 2.6 would not meet the Project objectives, but is retained in the PEA to provide a baseline for analysis of the Proposed Project.

2.2 APPROACH TO ALTERNATIVES SELECTION

2.2.1 Project Objectives

SCE evaluated a number of alternative methods for achieving the basic Project objectives defined in Section 1.0 (Purpose and Need and Objectives) before recommending the Proposed Project for approval by the CPUC. SCE has identified the following objectives for meeting the proposed Project's purpose and need (see Section 1.3) (each objective is followed by an abbreviated title that is used throughout this section):

1. Construct the Project to reliably interconnect new solar generation resources in the Ivanpah Dry Lake Area, and enable SCE and other California utilities to comply with California's RPS in an expedited manner (Reliably Interconnect Generation and Comply with RPS in an Expedited Manner).

2. Comply with all applicable reliability planning criteria required by the NERC, WECC, and CAISO (Comply with Reliability Planning Criteria).

3. Construct Project in an orderly, rational, and cost-effective manner to maintain reliable electric service, by minimizing service interruptions, during construction (Construct in an Orderly, Rational, and Cost-effective Manner).

4. Maximize the use of existing transmission line ROWs in order to minimize effects on previously undisturbed land and resources (Maximize Use of Existing ROW and Corridors).[1]

5. Minimize environmental impacts, through selection of routes, structure types, and locations, while still meeting Project objectives (Minimize Environmental Impacts).

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[1] See Garamendi Principles (Senate Bill 2431, Stats. 1988, Ch. 1457) regarding state transmission siting policies, including: (1) encourage the use of existing ROWs by upgrading existing transmission facilities where technically and economically justifiable; (2) when construction of new transmission lines is required, encourage expansion of existing ROW, when technically and economically feasible; (3) provide for the creation of new ROWs when justified by environmental, technical, or economic reasons as determined by the appropriate licensing agency; (4) where there is a need to construct additional transmission capacity, seek agreement among all interested utilities on the efficient use of that capacity.

6. Where existing ROW is not available, select the shortest feasible route that minimizes environmental impacts (Select the Shortest Feasible Route).

7. Meet Project needs in a cost-effective and timely manner (Meet Project Needs in a Cost-effective and Timely Manner).

The Proposed Project is discussed in detail in Section 3.0 Project Description. The Proposed Project maximizes use of existing ROW as set out in the objectives for the Project. Generally, routing alternatives were eliminated when they would require the establishment of new transmission corridors which, compared to the retained alternatives, would: (1) increase the environmental impacts, including impacts in currently undisturbed and urban areas; (2) cause disruption or relocation of existing or planned developments; (3) increase the Project cost; and (4) potentially create a longer Project schedule.

2.2.2 Initial Routing and Siting Study

This Project represents the plan of service identified for the area in three system impact studies undertaken in response to generation interconnection requests. The Project also represents the culmination of a comprehensive, long-term planning process undertaken by several key stakeholders over a period of several years. Participants included SCE, CAISO, the CPUC, the CEC, independent power producers, and others. Under the CAISO's federally approved tariff (CAISO Tariff), the CAISO is responsible for providing open and non-discriminatory access to the CAISO Controlled Grid. In order to satisfy this obligation, the CAISO, in cooperation with SCE, applied the LGIP[2] to identify the required transmission upgrades necessary to interconnect and deliver generation from the Ivanpah Dry Lake Area in a manner that:

- Provides the least-cost solution that reliably interconnects generation resources from the Ivanpah Dry Lake Area

- Facilitates the ability of California utilities to comply with the state-mandated RPS by providing access to planned renewable resources in the Ivanpah Dry Lake Area which have an executed PPA and are nearing completion of final environmental review

- Provides access to the Mountain Pass Competitive Renewable Energy Zone (CREZ) as identified by the Renewable Energy Transmission Initiative

After determining general areas where generation resources would be located, SCE developed numerous potential alignments for new transmission lines and different sites for the proposed new Ivanpah Substation. SCE typically considers several important factors when siting electric facilities. These factors include the following:

- Ability to modify or otherwise make use of existing transmission facilities rather than construct entirely new facilities in undisturbed areas
- Ability to follow established utility corridors
- Ability to utilize existing ROW where practicable

[2] The Federal Energy Regulatory Commission (FERC) issued Order No. 2003-C which approved Appendix B, Standard LGIP. The LGIP can be found at http://www.ferc.gov/industries/electric/indus-act/gi/stnd-gen/2003-C-LGIP.doc

- Minimization of environmental impacts
- Accessibility to construct and maintain supporting structures
- Length of new transmission lines and number of new structures or poles
- Number of crossings of highways, creeks, and other electric lines
- Minimization of exposure to geologic hazards
- Ability to avoid disruption or relocation of existing development
- Compatibility with local planning agencies' vision and/or planning strategy for development in the Project area to the extent practicable
- Easement acquisition costs
- Installation and maintenance costs
- Overall Project cost
- NERC and WECC Reliability and planning standards

Potential locations for new facilities were identified through fieldwork and review of aerial photographs and publicly available data. By comparing environmental considerations, engineering feasibility, and order of magnitude costs, SCE determined the preferred route and transmission method (i.e., type of conductor, overhead, or underground) for the proposed transmission line. For example, a transmission line connecting the new Ivanpah Substation can be routed different ways. Possible routing options were compared against each other. The proposed and feasible alternative transmission line routes and new substation site were determined by rejecting some route alignments and substation site options in favor of others for environmental, engineering feasibility, or cost reasons.

SCE engineers and construction managers experienced in design and construction of electric transmission lines conducted the engineering feasibility and relative cost evaluations. Following SCE's determinations, the technical staff responsible for the impact analysis sections of the PEA analyzed each segment and substation site determined by SCE to be potentially feasible against a variety of environmental criteria (primarily based on CEQA significance criteria as listed in the technical sections of this PEA).

2.2.3 Requirements of the California Environmental Quality Act

An important aspect of the environmental review process is the identification and assessment of a reasonable range of alternatives. CEQA Guidelines were used in the development and screening of alternatives. The CEQA Guidelines (Section 15126.6[d]) require the selection of a reasonable range of feasible alternatives to the Proposed Project, including a No Project Alternative. CEQA requires that sufficient information is provided about each alternative to allow meaningful evaluation, analysis, and comparison with the Proposed Project. A reasonable range of feasible alternatives is established through consideration of the following requirements:

- An alternative must have the potential to "avoid or substantially lessen any of the significant effects of the project" (Guidelines Section 15126.6[a]). If an alternative was identified that clearly does not have the potential to provide an overall environmental advantage as compared to the Proposed Project, it was eliminated from further consideration. At the screening stage, it is not possible to evaluate all of the impacts of the alternatives in comparison to the Proposed Project with absolute certainty, nor is it possible to quantify impacts. However, it is possible to identify elements of an alternative that are likely to be the sources of impact and to relate them, to the extent possible, to general conditions in the subject area.

- An alternative can be retained even if it is considered to be more costly than other alternatives or if it were to impede the attainment of Project objectives to some degree (Guidelines Section 15126.6[b]). The CEQA Guidelines state that alternatives whose effects cannot be reasonably ascertained and whose likelihood of implementation is remote or speculative do not have to be retained.

- A range of reasonable alternatives to the Proposed Project must be considered and discussed. The range of potential alternatives shall include those that would feasibly accomplish most of the basic objectives of the Project and could avoid or lessen one or more of the significant effects (Guidelines Section 15126.6[c]). The selection rationale for alternatives retained as well as eliminated should be included. Among the factors that may be used to eliminate alternatives from further consideration include failure to meet most of the basic Project objectives, infeasibility, or inability to avoid significant environmental impacts.

- Guideline Section 15126.6[f][1] states that the factors that may be taken into account when addressing the feasibility of alternatives include site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or other regulatory limitations, jurisdictional boundaries, and the proponent's control over alternative sites in determining the range of alternatives. For the Proposed Project's screening analysis, the overall feasibility of potential alternatives was assessed taking into consideration the specific economic, legal (regulatory), and technical feasibility of each alternative.

The CPUC uses the PEA and any subsequent data requests during their preparation of an Environmental Impact Report (EIR) pursuant to CEQA. CPUC would use the EIR as the CEQA document for the CPUC's consideration and approval of the Proposed Project. The EIR would also be reviewed by other agencies acting as responsible agencies under CEQA. The EIR may also be used by federal agencies as part of the information considered by the agency in making approval decisions that may be required for the Project.

2.2.4 <u>Requirements of the National Environmental Policy Act</u>

This PEA is not intended to comply with NEPA requirements; however, they were reviewed in the development and screening of alternatives. NEPA regulations (40 CFR 1502.14 [c]) identify the need to consider reasonable alternatives, including those that are not within the jurisdiction of the lead agency. In addition, NEPA (40 CFR Section 1502.23) states that the merits and drawbacks of the alternatives do not need to be displayed in a monetary cost/benefit analysis and that economic concerns should not outweigh important qualitative considerations. NEPA requires consideration of all aspects that may be relevant and important to decision-makers, including factors that are not related to environmental quality. NEPA requires substantial treatment of each alternative, including the proposed action, so that reviewers may evaluate their comparative merits (40 CFR Section 1502.14).

2.3 APPROACH TO ALTERNATIVES DEVELOPMENT

2.3.1 Project Area Description

2.3.1.1 Background

Under Sections 210 and 212 of the Federal Power Act (16 U.S.C § 824 [i] and [k]) and Section 25 of the CAISO Tariff, SCE is obligated to interconnect and integrate power generation facilities into its electric system. SCE is also required to comply with the state-mandated RPS to increase the sale of electricity produced by renewable energy sources.

SCE's Proposed Project includes replacing an existing 115kV electric transmission line with a new high-voltage electric transmission line and constructing a new substation. This section includes a general description of the Project area from the Ivanpah Dry Lake to the existing Eldorado Substation located in Boulder City, and focuses specifically on topography and level of development and land use.

There are many variables and criteria involved in selecting an appropriate route for new electric transmission lines. Considerations for selecting the route include the terrain, or topography, across which the transmission lines would travel and the level of development in the area. The terrain can result in higher Project costs and reduced transmission reliability. The level of development in the area is a key consideration for minimizing effects on communities.

2.3.1.2 Geographic Locations

The Project area can be described in four parts: (1) public lands in the Ivanpah Dry Lake Area (California); (2) private lands in Primm, Nevada; (3) public lands in Nevada between Primm and Boulder City; and (4) private lands in Boulder City, Nevada. A regional map is provided in Figure 2.3-1.

Public Lands in the Ivanpah Dry Lake Area: Public lands in the Ivanpah Dry Lake Area are located in the Mojave Desert, eastern portion of San Bernardino County, in California. The Ivanpah Dry Lake Area is bordered on the east by the State of Nevada, on the south by the Mojave National Preserve, on the west by the Clark Mountains, and on the north by the Mesquite and Stateline Wilderness Areas.

Private Lands in Primm, Nevada: The small community of Primm, Nevada is located on Interstate 15 (I-15) in Clark County, at the border of Nevada and California, roughly 40 miles south of Las Vegas. The Ivanpah Dry Lake, a popular land-sailing destination, is located in Primm.

Public Lands in Nevada between Primm and Boulder City: Public lands in the vicinity of the Project between Primm and Boulder City include the Ivanpah Valley and McCullough Pass (between the North McCullough Mountain and South McCullough Mountain Wilderness Study Areas).

Eldorado-Ivanpah Transmission Project

Regional Setting

Figure 2.3-1

Legend

- Proposed and Alternative Routes
- Exisiting Substation
- Proposed Substation

Reference Features

- State Boundary
- County Boundary
- Interstate Highway
- River
- Ocean/Lake
- City Limits

Sources: USGS, 2004, 2005, 2006, 2008; Clark County Comprehensive Planning, 2007; SCE, 2006, 2008; FEMA, 1996; BLM, 1998, 2005, 2006; EPG, 2008; SCAG, 2008; Global Energy Divisions LLC, 2006; ESRI ArcGIS Online Shaded Relief World, 2008

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Private Lands in Boulder City, Nevada: Private lands of Boulder City are located in the Eldorado Valley area which is situated east of the McCullough Range and primarily west of U.S. Route 95. The Eldorado-Piute areas of critical environmental concern (ACEC) border the southern boundary. Boulder City, Nevada contains the northernmost portion of the proposed Project, which is approximately 37.0 miles east of the border of Nevada and California.

2.3.2 Transmission Line Alternatives

Alternatives to the Project were developed and evaluated based on the Project objectives, purpose, and need. As discussed in Section 1.0 of this PEA, the purpose of the Proposed Project is to provide the electrical facilities necessary to integrate up to 1,400 MW of new solar generation in the Ivanpah Dry Lake Area. SCE's Proposed Project includes replacing an existing 115kV electric transmission line with a new high-voltage electric transmission line and constructing a new substation to deliver electricity from new solar generation facilities, planned by independent power producers, in the Ivanpah Dry Lake Area. The solar generation facilities and new substation is currently undergoing environmental permitting as part of the Ivanpah Solar Electric Generation System 0-AFC-5.

Selection of alternatives either for further evaluation or elimination was based on their ability to meet the purpose and need in a manner that was consistent with the objectives listed in Section 1.3, including engineering feasibility, cost effectiveness, and minimization of environmental impacts. Alternatives retained for evaluation are discussed in Section 2.4.1 and alternatives eliminated are discussed in Section 2.4.2. The range of alternatives initially considered included: (1) system alternatives; (2) technology alternatives; and (3) routing/siting alternatives, and are described as follows:

- System alternatives include non-transmission alternatives, such as in-basin generation of electricity or implementation of demand-side management and energy efficiency programs. Other system alternatives, such as connecting Ivanpah Dry Lake Area with lower voltage or higher voltage transmission facilities, or connecting the Ivanpah Dry Lake Area to a substation different than Eldorado (new substation near the Mojave National Preserve), involve a different method of service for interconnecting the Ivanpah Dry Lake Area. All these system alternatives were eliminated from further consideration because they do not meet the Project purpose and need (see Section 2.4.2.1).

- Technology alternatives include composite core conductor, tower construction and materials, overhead construction versus undergrounding transmission lines, and single-circuit or double-circuit transmission lines. Technologies were evaluated based on their feasibility, cost, reliability, and environmental impacts.

- Types of routing and siting alternatives include alternative locations, use of existing corridors and ROWs, and establishment of new corridors and ROWs. Feasibility of the alternatives were determined by topography, cost and time associated with establishing transmission lines and associated equipment and facilities, and the ability of a corridor configuration to provide for reliability requirements. Environmental advantages and disadvantages evaluated included, but were not limited to, ground disturbance, visual impacts, and potential impacts to existing or planned developments.

2.3.3 Initial Routing and Siting

For integrating generation resources in the Ivanpah Dry Lake Area, technical evaluations have been conducted as part of several System Impact Studies. These technical evaluations determined that the existing system is incapable of integrating the generation resources without significant system upgrades. As a result, numerous Project arrangements were examined to identify the optimal Project arrangement that would meet stated Project objectives, purpose, and need. Factors considered included use of existing ROW, minimizing environmental impacts, topographic limitations, development, easement acquisition costs, and operation and maintenance costs.

2.3.4 Alternatives Screening Criteria

Alternatives were evaluated with respect to their ability to meet the purpose and need of the Proposed Project, engineering feasibility, cost effectiveness, and potential environmental impacts. Specifically, the alternatives were evaluated against the Project objectives listed in Section 2.2.1 Project Objectives.

2.4 SCREENING RESULTS

This section presents the results of the alternatives screening process. The screening analysis did not focus on economic factors other than the consideration of whether the alternatives were economically feasible. Therefore, alternatives capable of eliminating or reducing significant environmental effects were considered even though they could impede the attainment of the Project objectives or prove to be more costly.

2.4.1 Alternatives Evaluated in the Proponent's Environmental Assessment

The information in this section briefly describes the alternatives retained for evaluation in this PEA and provides reasons for retaining the alternatives. Expanded descriptions are provided in Section 3.0 Project Description.

2.4.1.1 System Alternative

The proposed system alternative is driven by the purpose and need of the Project (Section 1.0) and has been formulated through the following directives and decisions:

- Comply with the state-mandated RPS, per California Senate Bill 107 (see Section 1.1.2)
- Interconnect and integrate power generation facilities, such as those planned for the Ivanpah Dry Lake Area, into SCE's electric system, per CAISO Tariff (see Section 1.1.3)

2.4.1.2 Technology Alternatives

Standard Core Conductor

Description: For the Proposed Project, SCE would use standard core conductor equipment to support new transmission line construction. For the 220kV transmission lines, SCE would use two bundled 1,590 kcmil ACSR conductor or "2B-1590 ACSR" equipment with nonspecular finish.

Project Objectives, Feasibility, and Environmental Considerations: Standard core conductor is durable and reliable in long-term use and therefore would meet Project objectives. Standard core conductor is a proven, reliable technology that is also the most cost-effective choice for construction of the Proposed Project. Therefore, standard core conductor was retained for use on the Proposed Project.

Lattice Steel Towers

Description: Lattice steel towers (LST) are a common type of transmission structure used in high voltage transmission line applications. An LST is a freestanding steel framework that has been used to support transmission lines by many of the nation's largest utilities. For the Proposed Project, SCE would use LSTs to support new transmission construction; the Project would also use both single-circuit and double-circuit structures.

Project Objectives, Feasibility, and Environmental Considerations: The use of LSTs offers several advantages as compared to other structure types. Primarily, LSTs have low maintenance costs and adequate strength-to-weight ratios. High quality hot-dipped galvanizing of structural members and fasteners assures long term integrity, reliability, and low-maintenance. Because LSTs have a well-earned reputation for dependability LSTs were retained as the primary structure type used for Proposed Project construction of the Proposed Project.

Tubular Steel Poles

Description: Tubular steel poles (TSP) are relatively new structures used by utilities. TSPs are steel poles manufactured in long sections which taper in cross-sections from the base of the pole to top of the pole.

Project Objectives, Feasibility, and Environmental Considerations: The use of TSPs can offer an advantage over LSTs in certain types of applications, such as locations where ROW width is constrained or space for structure installation is limited; for example, in developed urban areas. TSPs require large footings and are manufactured in long sections requiring use of long-bed trucks for transportation and heavy cranes that can lift and stack the TSP sections for assembly. Because TSP sections are long and heavy, construction of TSPs by helicopter is not practical. TSPs would be viable for use for the Proposed Project where construction equipment can be mobilized to the area. Therefore, TSPs were considered for site-specific locations.

Galvanized Structures

Description: Transmission structures are galvanized for corrosion protection purposes. This process allows for shading, which helps reduce their aesthetic impact. Primary methods for shading or coloring structures include galvanizing, which is a factory-applied non-paint treatment applied prior to construction or painting, which would be applied to steel structure elements after structure construction is completed.

Project Objectives, Feasibility, and Environmental Considerations: LSTs require a continuous electric path through each steel element to ground for personnel safety and to mitigate the effects of short circuits or lightning strikes. Thus, any coloring technique used for LSTs must preserve this continuous electrical path. Because galvanizing is a non-paint treatment, there is no coating between structure pieces that would impede surface-on-surface contact, and the electric path between all steel elements is preserved. Galvanizing is a one-time application without the on-going maintenance-related environmental impacts associated with reapplication of new coloring. Presently, available galvanizing treatments range from light to dark.

Galvanizing is a durable method of shading transmission structures, which protects from corrosion and reduces aesthetic impact while preserving proper grounding of structures to protect personnel and equipment. SCE has retained galvanizing as the preferred alternative for LSTs.

Overhead Construction

Description: The transmission segments of the Proposed Project would use overhead construction at voltages of 220kV. Under this method of construction, transmission conductor would be strung overhead on supporting steel structures. Heights of structures for the Proposed Project would vary widely depending on the electrical clearances required.

Project Objectives, Feasibility, and Environmental Considerations: Overhead construction could provide infrastructure to prevent overloading of existing facilities and provide the capacity for transferring future renewable energy generated in the Ivanpah Dry Lake Area to customers of the SCE transmission grid, through the installation of the 220kV transmission line.

Overhead transmission line construction is a proven and reliable technology for high voltage transmission line applications. It is more cost-effective than underground construction. Therefore, overhead construction was retained for primary design of the Proposed Project transmission line.

2.4.1.3 Routing/Siting Alternatives

RA Retained 1 – Use of Existing SCE Transmission Corridor (Proposed Route)

Description: This alternative would mostly utilize the existing ROW by removing the existing 115kV transmission line and replacing it with a new 220kV double-circuit transmission line between the proposed Ivanpah Substation and the existing Eldorado Substation. Because of the multiple existing transmission line crossovers, there is a need to expand the existing ROW at these transmission line crossovers in order to transition from 1 double-circuit to 2 single-circuit 220kV transmission lines and back to 1 double-circuit 220kV transmission line. Additional detail regarding the routing of this alternative is provided in Section 3.0.

Project Objectives, Feasibility, and Environmental Considerations: While this alternative would require new ROW acquisition, the new ROW would be limited to areas where a transmission line crossover requires the transition from 1 double-circuit structure to 2 single-circuit structures and back to 1 double-circuit structure. This alternative would result in the least amount of new ROW requirements and would therefore achieve the most efficient use of land for energy. Additionally, providing needed transmission routing in the existing ROW would help to meet California's RPS in an expedited and cost-effective manner. Furthermore, the double-circuit 220kV transmission line would enhance the capability of SCE's transmission system to integrate up to 1,400 MW of new renewable resources in the Ivanpah Dry Lake Area.

This line routing would meet the Project objectives, purpose, and need. This alternative would maximize the use and capability of the existing and new ROWs and meet the capacity needs of the Ivanpah Dry Lake Area. Furthermore, by optimizing the use of the existing ROW, impact to the environment would be reduced. The use of existing transmission corridor was retained for further analysis.

<u>RA Retained 2 – Use of Adjacent Los Angeles, Department of Water and Power AC Transmission Corridor (Alternative A)</u>

Description: This alternative would eliminate several difficult crossovers near the Eldorado Substation. The alternative would involve deviating from the RA Retained 1 alternative only near the Eldorado Substation area. This alternative would use a new ROW adjacent to the existing Los Angeles, Department of Water and Power (LADWP) Alternating Current (AC) transmission corridor from the McCullough Pass beginning on Township 25 South, Range 62 East, Section 19 (Boulder City) to near the Eldorado Substation.

Project Objectives, Feasibility, and Environmental Considerations: Because the use of expanded LADWP transmission corridor would meet the objectives, purpose, and need of the Project and is consistent with the plan of service, the alternative was retained for analysis.

<u>RA Retained 3 – Use of Adjacent Los Angeles, Department of Water and Power DC Transmission Corridor (Alternative B)</u>.

Description: The alternative would involve deviating from the RA Retained 1 alternative only near the Eldorado Substation area. The alternative would use a new ROW adjacent to the existing LADWP Direct Current (DC) transmission corridor and proceed north from LADWP's McCullough Substation northerly and then southwesterly on a new ROW to a point where the existing SCE 115kV line heads south, towards the Eldorado Valley Dry Lake.

Project Objectives, Feasibility, and Environmental Considerations: Because the use of expanded LADWP transmission corridor would meet the objectives, purpose, and need of the Project and is consistent with the plan of service, the alternative was retained for analysis.

RA Retained 4 – North of Ivanpah Dry Lake and Primm, Nevada (Alternative C)

Description: This alternative would require new ROW north of the Ivanpah Dry Lake and Primm, Nevada, but would eliminate routing the 220kV transmission line through the Ivanpah Dry Lake and through the town of Primm, Nevada. The transmission line would be routed off the existing SCE transmission corridor just before entering the Ivanpah Dry Lake, and head north and around the dry lake as well as around Primm, Nevada. The transmission line would join back to the existing SCE transmission corridor at a point northeast of Primm, Nevada. Except for the acquisition of new ROW in order to be routed around the Eldorado Dry Lake and Primm, Nevada, this alternative would be similar to RA Retained 1.

Project Objectives, Feasibility, and Environmental Considerations: This alternative would generally meet the Project objectives, purpose, and need and further provide the critical interconnection of solar generation resources in the Ivanpah Dry Lake Area to comply with California's RPS.

RA Retained 5 – South of Primm, Nevada (Alternatives D and E)

Description: This alternative would require new ROW from the Ivanpah Dry Lake east towards the existing LADWP AC transmission corridor. The transmission line would be routed off the existing SCE transmission corridor in the Ivanpah Dry Lake (Township 17 North, Range 15 East, Section 18) and head east towards the LADWP AC transmission corridor. From this point, the alternative would require expansion of the existing LADWP corridor until the transmission line joins back with the existing SCE transmission corridor. Except for the acquisition of new ROW in order to be routed south of Primm, Nevada, this alternative would be similar to RA Retained 1.

Project Objectives, Feasibility, and Environmental Considerations: This alternative would generally meet the Project objectives, purpose, and need and further provide the critical interconnection of solar generation resources in the Ivanpah Dry Lake Area to comply with California's RPS.

2.4.2 Alternatives Considered and Eliminated

2.4.2.1 System Alternatives

System alternatives were developed as part of the serial interconnection study process.

System Alternative 1 – Non-Transmission System

Description: Non-transmission system alternatives include the development of in-basin generation, instead of interconnecting generation from the Ivanpah Dry Lake Area and implementation of demand-side management and energy efficiency programs.

Project Objectives, Feasibility, and Environmental Considerations: Under Sections 210 and 212 of the Federal Power Act (16 U.S.C § 824 [i] and [k]) and Sections 3.2 and 5.7 of the CAISO

Tariff, SCE is obligated to interconnect and integrate power generation facilities into its electric system. Numerous applications have been submitted by generation developers requesting interconnection with the Ivanpah Dry Lake Area (see Section 1.1.4). Because SCE is obligated to interconnect generation as requested, non-transmission system alternatives would not eliminate the need to provide the electrical facilities necessary to integrate up to 1,400 MW of new generation in the Ivanpah Dry Lake Area.

The Non-Transmission System Alternative does not interconnect and integrate generation resources in the Ivanpah Dry Lake Area (Objective 1 – Construct in an Orderly, Rational, and Cost-effective Manner); therefore, this alternative was eliminated from further consideration.

<u>System Alternative 2 – Reconductor Existing 115kV Line</u>

Description: Reconductoring of the existing line between the Ivanpah Dry Lake Area and the existing Eldorado Substation would involve replacing the existing low capacity conductor with a new conductor of higher capacity.

Project Objectives, Feasibility, and Environmental Considerations: Under Sections 210 and 212 of the Federal Power Act (16 U.S.C § 824 [i] and [k]) and Sections 3.2 and 5.7 of the CAISO Tariff, SCE is obligated to interconnect and integrate power generation facilities into its electric system. The total amount of generation interconnection requests received in the Ivanpah Dry Lake Area would exceed the amount of transmission capacity made available under a reconductor alternative.

Because SCE is obligated to interconnect generation as requested, the reconductor alternative would not provide the needed capacity to integrate up to 1,400 MW of new generation in the Ivanpah Dry Lake Area. Consequently, the Reconductor Alternative does not interconnect and integrate up to 1,400 MW of generation resources in the Ivanpah Dry Lake Area (Objective 1 – Construct in an Orderly, Rational, and Cost-effective Manner); therefore, this alternative was eliminated from further consideration.

<u>System Alternative 3 – Lower Voltage Transmission Service</u>

Description: Lower voltage transmission service system alternatives would include the construction of new 115 kV transmission facilities between the Ivanpah Dry Lake Area and the existing Eldorado Substation.

Project Objectives, Feasibility, and Environmental Considerations: The use of a lower voltage transmission system alternative would result in an undersized method of service for the Ivanpah Dry Lake Area. SCE standard 115kV conductor would provide up to 217 megavolt amperes (MVA) of capacity. Within the existing ROW, the maximum number of 115kV lines that can be accommodated is two sets of double-circuit structures or four individual 115\kV lines. This would limit the maximum amount of generation that can be accommodated to no more than 868 MVA.

Because SCE is obligated to interconnect generation as requested, the lower voltage system alternative would not provide the needed capacity to integrate up to 1,400 MW of new generation in the Ivanpah Dry Lake Area. Consequently, the Lower Voltage System Alternative does not interconnect and integrate up to 1,400 MW of generation resources in the Ivanpah Dry Lake Area (Objective 1 – Construct in an Orderly, Rational, and Cost-effective Manner); therefore, this alternative was eliminated from further consideration. In addition, this alternative does not meet the Project objectives of maximizing use of existing ROW (Objective 6 – Maximize Use of Existing ROW and Corridors).

System Alternative 4 – Higher Voltage Transmission Service

Description: Higher voltage transmission service system alternatives would include the construction of new 500kV transmission facilities between the Ivanpah Dry Lake Area and the existing Eldorado Substation.

Project Objectives, Feasibility, and Environmental Considerations: The use of a higher voltage transmission system alternative would require the expansion of the existing 100-foot-wide ROW. The amount of ROW expansion would be dependant on the construction design, single-circuit versus double-circuit 500kV. If a single-circuit design standard were selected, the maximum amount of generation that can be interconnected is limited to no more than 1,150 MW as limited by the CAISO single contingency maximum generation tripping limit. The use of a double-circuit 500kV design standard would increase the maximum amount of generation that can be interconnected to 1,400 MW as limited by the CAISO double contingency maximum generation tripping limit. To further increase the amount of generation that can be interconnected, additional transmission not currently defined would need to be constructed.

This transmission alternative does not provide for any additional generation interconnection, as compared to a 220kV alternative, and requires the expansion of existing SCE ROW. Consequently, the Higher Voltage System Alternative does not interconnect and integrate more than 1,400 MW of generation resources in the Ivanpah Dry Lake Area (Objective 1 – Construct in an Orderly, Rational, and Cost-effective Manner); therefore, this alternative was eliminated from further consideration. In addition, this alternative does not meet the Project objectives of maximizing use of existing ROW (Objective 6 – Maximize Use of Existing ROW and Corridors).

2.4.2.2 Technology Alternatives

Technology Alternative 1 – Composite Core Conductor Alternative (Alternative to Standard Core Conductor)

Description: This alternative involves replacing the conductor on the existing 115kV single-circuit line between the Ivanpah Dry Lake Area and the Eldorado Substation.

Project Objectives, Feasibility, and Environmental Considerations: Because the composite core conductor is a new technology, it has several drawbacks when it is compared to the standard core conductor. While the United States Department of Energy Technical Review Committee on Composite Core Conductors has deemed several composite core conductors as a “commercial product,” the technology is not supported by sufficient field experience and, therefore, SCE finds that its reliability in long-term use is unknown. The technology is 10 to 15 times more expensive than the standard core conductor and more fragile than conventional conductors. Therefore, the use of composite core conductor does not represent an added benefit to the system.

Furthermore, the amount of generation requesting interconnection significantly exceeds the amount of transmission capacity that can be gained with the use of composite core conductor resulting in a short-lived alternative. As a result, this alternative does not reduce any of the environmental impacts as compared to the retained Project alternatives. In addition, implementation of this alternative would increase the cost of the Proposed Project as the need for removal of the existing 115kV line to upgrade corridor capability would not be eliminated.

Technology Alternative 1 would result in greater Project costs and would not provide the needed transmission capacity into the Ivanpah Dry Lake Area; therefore, it would not meet Objective 1 (Construct in an Orderly, Rational, and Cost-effective Manner). Because the alternative would meet neither Objective 1 nor Objective 9 (Meet Project Needs in a Cost-effective and Timely Manner), it was eliminated from further consideration.

<u>Technology Alternative 2 – Painted Transmission Structures (Alternative to Galvanized Structures)</u>

Description: Under this alternative, transmission structures would be painted after construction rather than using the proposed, galvanized structures which do not require painting after construction. Presently, available galvanizing treatments range from light to dark. Both galvanized and paint coatings can be used on transmission towers to protect the steel surfaces.

Project Objectives, Feasibility, and Environmental Considerations: For personnel safety, LSTs require a continuous electrical path through each steel element to the ground. This electrical path is achieved when the individual galvanized steel elements are securely bolted together. Painting or powder coating of steel lattice structure elements prior to assembly impedes the continuous electric path because it creates an insulator between the elements. Therefore, paint applications for lattice steel structures would need to be applied in the field *after* assembly of the individual pieces into a tower. Powder coating would not be possible after construction because it must be applied in a specialized closed environment.

From a practical perspective, SCE can paint structures in the field and has done so for very specific, limited purposes. However, painting in the field could present additional safety concerns, higher operating and maintenance costs, and have more long-term environmental effects associated with ongoing maintenance than galvanizing, including emission and inadvertent paint spills. The paint would have to be applied in the open air where volatile organic compound emissions would occur and paint spills could occur. In addition, paint has a life cycle much shorter than the structure. This would require repainting over the life of the Project, resulting in additional environmental impacts associated with mobilizing the equipment required to each of the tower sites and scraping off loose paint before a new paint coat can be applied. To reduce the long-term environmental effects resulting from the use of painted structures, SCE uses galvanizing or similar factory-applied conductive non-paint treatments.

Because painted structures would require periodic applications of new paint coatings resulting in higher maintenance costs related to the Proposed Project, and the environmental impacts would be increased as compared to the galvanized alternative, Technology Alternative 2 was eliminated from further consideration.

Technology Alternative 3 – Undergrounding Transmission Lines (Alternative to Overhead Transmission Lines)

Description: Transmission lines are overhead conductors or underground cables capable of transmitting 220kV or 500kV. Lines energized at lower voltages are subtransmission or distribution lines. The following four underground technologies are commercially available for 500kV: high-pressure fluid-filled (HPFF) cables; self-contained fluid-filled (SCFF); solid dielectric (XLPE) transmission cables; and compressed gas insulated transmission lines (CGTL).

While HPFF and SCFF are feasible technologies, they have a potential to release dielectric fluid into the environment. World-wide, the CGTL system has been installed for only up to 2 miles in length. Its reliability over greater distances is not known. The assembly of CGTL requires a dust-controlled environment to avoid particle pollution of the insulated gas. CGTL may be feasible for short distances; however, the cost is extremely high (ranging from 10 to 20 times cost of overhead, depending on installation requirements). CGTL also requires greater ongoing maintenance to ensure reliable operation.

In relatively flat terrain, most of the Proposed Project, installing 220kV underground facilities would require trenching of the cable and associated underground infrastructure (e.g., cooling equipment, splice vaults, and underground ducts). The ROW above the underground facilities would need to be maintained undeveloped and clear of vegetation.

In mountainous terrain, the underground alternative would require a combination of trenching and tunneling due to the mechanical restrictions associated with 220kV underground cables. Underground 220kV cables do not provide sufficient flexibility to follow terrain in mountainous areas. In addition, the gravitational pull on the cables in terrain with significant uphill and downhill grades would require the installation of anchoring facilities in order to minimize the cable slippage. As with any high-voltage facility, the design would include the installation of the cables and associated underground infrastructure with proper access for maintenance. These requirements would increase the overall Project environmental impacts and costs.

Installation of CGTL would require an open trench or underground tunnel with room for a maintenance vehicle to travel the length of the installation and a transition station at each end.

Due to the time required for repair of underground facilities, additional cables or CGTL tubes would have to be installed as spares. This would further increase the impact by requiring additional ducts or tunnels.

Project Objectives, Feasibility, and Environmental Considerations: Underground construction of the transmission line would result in greater land disturbance, a longer construction period, and greater Project cost (due to a longer construction period, and specialized manufacturing and construction requirements) than the Proposed Project. In addition, underground 220kV technologies in geographic areas with active fault zones have a greater potential, as compared to overhead construction, to result in prolonged service interruption because any sections requiring repair would be more difficult to identify and would take longer to repair. While overhead conductors can be repaired within days, underground cables might take months to repair.

Underground installation of cables could be achieved with trenching and tunneling construction methods. Both construction methods would result in impacts to air quality from emissions from construction equipment and from dust generation during construction and the use of unpaved access roads. Both could result in the release of hazardous materials into the environment, either as inadvertent spills during construction or during failure of the cables and subsequent release of sulfur hexafluoride SF_6 gas or dielectric fluid. Both would result in large amounts of solid waste (i.e., soil and rock) which would have to be disposed of properly. Trenching would potentially affect surface features, such as habitat, soils, and surface water. Furthermore, it could disturb cultural resources and hazardous waste (e.g., mining waste) buried at shallow depths. Tunneling could create noise and vibration, potentially affecting nearby structures and protected species. Tunneling could affect both surface and groundwater resources, as well as deeply buried geologic and paleontologic features.

Undergrounding portions of the Proposed Project would neither minimize environmental impacts (Objective 7 – Minimize Environmental Impacts) nor construct the Project in a cost-effective and timely manner (Objective 9 – Meet Project Needs in a Cost-effective and Timely Manner). Therefore, Technology Alternative 4 was eliminated from further consideration.

<u>Technology Alternative 4 – Single Circuit (Alternative to Double-circuit)</u>

Description: This alternative would construct a 220kV transmission line between the proposed Ivanpah Substation and existing Eldorado Substations for a total of 36 miles as a single-circuit transmission line mostly on existing ROW.

Project Objectives, Feasibility, and Environmental Considerations: This alternative would not facilitate the possibility of adding a second 220kV transmission line mostly within existing ROW. Without a second 220kV transmission line, the maximum amount of generation that can be interconnected is limited to no more than 1,150 MW. As a result, the need for future upgrades would necessitate either complete tear-down of the single-circuit 220kV transmission line and rebuilding it with a double-circuit 220kV transmission line (i.e., the Proposed Project), or the acquisition of new ROW and the construction of new single-circuit or new double-circuit transmission line.

This alternative would not result in the construction of facilities in an orderly, rational, and cost-effective manner (Objective 3 – Construct in an Orderly, Rational, and Cost-effective Manner) as it would require tear-down of the single-circuit transmission line built under this alternative to accommodate future transmission requirements with a replacement double-circuit transmission line. Such future upgrades would result in construction impacts that would be avoided with implementation of the Proposed Project. Constructing a single-circuit transmission line now and replacing it in the future would not minimize environmental impacts (Objective 7 – Minimize Environmental Impacts) and costs (Objective 9 – Meet Project Needs in a Cost-effective and Timely Manner). Because the alternative does not meet Objectives 3, 7, and 9, it was eliminated from further analysis.

2.4.2.3 Routing/Siting Alternatives

RA Eliminated 1 – Ivanpah Substation to Eldorado Substation

Description: This alternative would create a new ROW for the 220kV transmission line between the proposed Ivanpah Substation and the existing Eldorado Substation at a distance of at least 2,000 feet on either side of the existing SCE 100-foot corridor. The width of the new, separate ROW would be at least 100 feet or greater.

Project Objectives, Feasibility, and Environmental Considerations: This alternative would not improve system reliability because there is currently no risk of simultaneous outage of transmission lines contained within a common transmission corridor beyond the Proposed Project. However, placement of the new 220kV transmission line in a new, separate ROW would require the establishment of new access roads. The width of the new, separate ROW would be at least 100 feet.

This alternative would not maximize the use of existing ROW (Objective 6 – Maximize Use of Existing ROW and Corridors), and would therefore result in greater environmental effects and Project costs than the retained alternative. Therefore, this alternative was eliminated.

2.5 TELECOMMUNICATION ALTERNATIVES

2.5.1 Introduction

Once the transmission system type and routing were identified, telecommunications systems were evaluated that would meet the needs of the transmission system. The Proposed Project would require construction of two fully diverse and redundant communication paths to support both a special protection system that would trip the SCE Eldorado-Ivanpah 220kV transmission line relays under specific outage contingencies, as well as for the operating and monitoring of the substation and transmission line equipment. The paths would connect the Eldorado Substation to the proposed Ivanpah Substation. New telecommunication infrastructure would be installed to provide protective relay circuit, Supervisory Control and Data Acquisition (SCADA) circuit, data, and telephone services to the proposed Ivanpah Substation.

2.5.2 Telecommunication System Alternatives Considered

Three telecommunication transmission network types were evaluated for the Proposed Project: (1) OPGW placed on overhead on transmission towers or underground; (2) microwave sites with a line-of-sight between microwave stations; or (3) a combination OPGW and microwave system.

2.5.2.1 Optical Ground Wire and Combined Microwave System

An OPGW link was identified for the Proposed Project. The OPGW communication link proposed between the Eldorado Substation and the proposed Ivanpah Substation consists of two diverse telecommunication paths referred to as Path 1 and Path 2. Path 1 is from the

Eldorado Substation to the proposed Ivanpah Substation and uses new OPGW along the proposed Eldorado-Ivanpah 220kV transmission line to be constructed from the Eldorado Substation to the Ivanpah Substation. Path 2 from the Eldorado Substation to the Ivanpah Substation uses the existing SCE Eldorado-Lugo 500kV transmission line, an underground duct, and a new microwave tower. Other alternatives considered to the microwave tower include the combination of All Dielectric Self Supporting (ADSS) fiber optic cable on an existing Nipton 33kV distribution line, and underground fiber optic cable.

2.5.2.2 Microwave System

To provide two diverse telecommunication paths from the Eldorado Substation to the Ivanpah Substation would require development of seven new microwave sites. This would involve building six microwave towers, four new communication buildings, and one passive reflector site. All of these sites would require helicopter transport to deliver large items. Helicopter transport requires a large staging area for helicopter pick-up resulting in significant land disturbance. The alternate option for transport to these microwave sites is to widen and improve the roadways to these sites, but this will cause even more land disturbance. Most of the microwave sites identified have existing microwave facilities and would require significant grading to make room for new tower and communication building.

2.5.2.3 Alternatives Screening Criteria

Alternatives were evaluated with respect to their ability to meet the purpose and need of the Proposed Project, engineering feasibility, cost effectiveness, and potential environmental impacts.

2.5.2.4 Screening Result

The combined OPGW microwave alternative would meet Project objectives, is the most feasible, and minimizes environmental effects. This alternative was selected for the Proposed Project.

2.6 NO PROJECT ALTERNATIVE

Description: Under the No Project Alternative, there would be no facility upgrades or other changes to the electric transmission system. Proposed alternatives, including new and upgraded transmission lines and substations, would not be constructed.

Project Objectives, Feasibility, and Environmental Considerations: With implementation of the No Project Alternative, key objectives that would not be met are the requirement that SCE interconnect and integrate power generation facilities into its electric system and that the RPS target goals are met. The No Project Alternative would not meet the objectives, purpose, and need of the Proposed Project as described in Section 1.0.

The No Project Alternative would not meet the purpose of the Proposed Project to provide the electrical facilities necessary to integrate levels of new solar generation. Inclusion of the No Project Alternative is prescribed by CEQA Guidelines. Although the No Project Alternative does not satisfy the purpose and need for the Proposed Project, it serves as a baseline against which the impacts of the Proposed Project can be evaluated.

3.0 PROJECT DESCRIPTION

SECTION 3.0
PROJECT DESCRIPTION

3.1 INTRODUCTION

SCE proposes to construct a new 220kV to 115kV substation, a new 220kV transmission line, a new portion of an existing 115kV subtransmission line, an extension of an existing 33kV distribution line, and a new telecommunication system. The substation would be called Ivanpah Substation and would include 220kV and 115kV switchracks. It would be located in California near Primm, Nevada. The 220kV transmission line would be approximately 35 miles long, and of double-circuit construction. It would be located between the existing Eldorado Substation in Nevada and the proposed new Ivanpah Substation in California. The Eldorado-Ivanpah portion of the existing SCE Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line would be removed and replaced with the proposed 220kV transmission line. Removal of the existing transmission line, construction of the new transmission line, construction of the new Ivanpah Substation, modifications at SCE's existing Eldorado Substation, and construction of a telecommunications system are hereafter referred to as the Project. The telecommunication system would consist of two fully diverse and redundant telecommunication paths and would include: (1) Path 1 - placement of approximately 35 miles of new OPGW along the proposed Eldorado-Ivanpah 220kV transmission line from the Eldorado Substation to the Ivanpah Substation; or (2) Path 2 - along a path consisting of replacement of an overhead ground wire (OHGW) with OPGW on an approximately 25-mile section of the existing SCE Eldorado – Lugo 500kV transmission line, and installation of approximately 5 miles of fiber optic cable in an underground duct from the Eldorado-Lugo transmission line to the town of Nipton. Path 2 would then follow a route from the town of Nipton to the Ivanpah Substation on either a preferred microwave path or one of two alternate routes, both following the existing Nipton 33kV distribution line to the Ivanpah Substation. The Proposed Project also includes changes inside the Eldorado Substation to accommodate the new 220kV lines. The Project is shown in Figure 3.1-1 (located in the Map Volume). This project description is based on planning level assumptions. Exact details would be determined following completion of preliminary and final engineering, identification of field conditions, availability of labor, material, and equipment, and compliance with applicable environmental and permitting requirements.

3.2 ELDORADO-IVANPAH 220KV TRANSMISSION LINE

The existing 115kV line would not provide the power transmission capacity necessary for projected solar generation development in the Ivanpah area. A new 220kV double-circuit line would meet the necessary requirements and would be constructed within the existing 115kV ROW, wherever feasible. The proposed 220kV line would be constructed on double-circuit LST for most of the route. Where required, additional ROW and single-circuit steel H-frame structures would be used to facilitate the crossing of other transmission lines in the Project area.

The entire Proposed Project would span approximately 28 miles in Nevada and approximately 7 miles in California. The CPUC and BLM are the lead agencies for compliance with the CEQA and NEPA, respectively. The Nevada Utilities Commission is the lead agency for compliance with the Nevada Utility Environmental Protection Act.

The CPUC and the BLM have agreed to prepare a combined EIR/Environmental Impact Statement (EIS) or Environmental Assessment (EA) presenting the Proposed Project and evaluating potential impacts of the Proposed Project on the existing environment. The purpose of this PEA is to define the Project, present SCE's data collection of environmental resources of the study area, present SCE's evaluation of potential impacts, and list SCE's proposed measures to reduce impacts to less than significant.

The location maps of the proposed and alternate line routes are shown in Figure 3.1-1 (located in the Map Volume). Project facility data and land disturbance summary data for the proposed and alternative routes are presented in Table 3-1. Factors used to estimate land disturbances on the proposed and alternative routes are presented in Tables 3-2 through 3-7. All data provided in this project description is based on planning level assumptions and may change following completion of preliminary and final engineering, identification of field conditions, availability of labor, material, and equipment, and any environmental and permitting requirements.

3.2.1 Proposed Route Description

A portion of the existing SCE Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line would be removed and replaced with 220kV double-circuit transmission line (the Eldorado-Ivanpah transmission line) mostly within the existing ROW between the existing Eldorado Substation in Nevada and the to-be constructed Ivanpah Substation in California (the Eldorado-Ivanpah 220kV transmission line).

The proposed Eldorado-Ivanpah 220kV transmission line route (Figure 3.1-1 [located in the Map Volume] begins at the existing Eldorado Substation). The line exits the substation to the north and joins the existing Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line ROW. The line would head generally west on a 130-foot ROW and crosses below five existing LADWP transmission lines (Eldorado-McCullough 500kV, Mead-Victorville 287kV, McCullough-Victorville 1 500kV, McCullough-Victorville 2 500kV, and Intermountain-Adelanto +/-500kV DC). The SCE existing 70- to 100-foot ROW will need to be widened to a minimum 100-foot and where possible to a 130-foot ROW for the entire route to accommodate 220kV construction. At major utility transmission line crossings, a 250-foot ROW would be required at the crossing locations for side-by-side single-circuit 220kV steel H-frame structures (Figure 3.2-1). There is a possibility that existing transmission lines of other utilities may have to be modified in order to facilitate the crossing of the proposed 220kV transmission line.

At Milepost 2.1 (Tower 20), the line makes a sharp turn to the southwest along the existing SCE Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line 100-foot ROW for approximately 5.0 miles until it turns due west and immediately crosses below the Intermountain-Adelanto +/-500kV DC transmission line. At the crossing location, the existing 100-foot ROW will need to be widened to a 250-foot ROW for side-by-side single-circuit 220kV steel H-frame structures. This may be difficult given the congestion in this area. Additional survey information will be evaluated to determine the optimum crossing alignment.

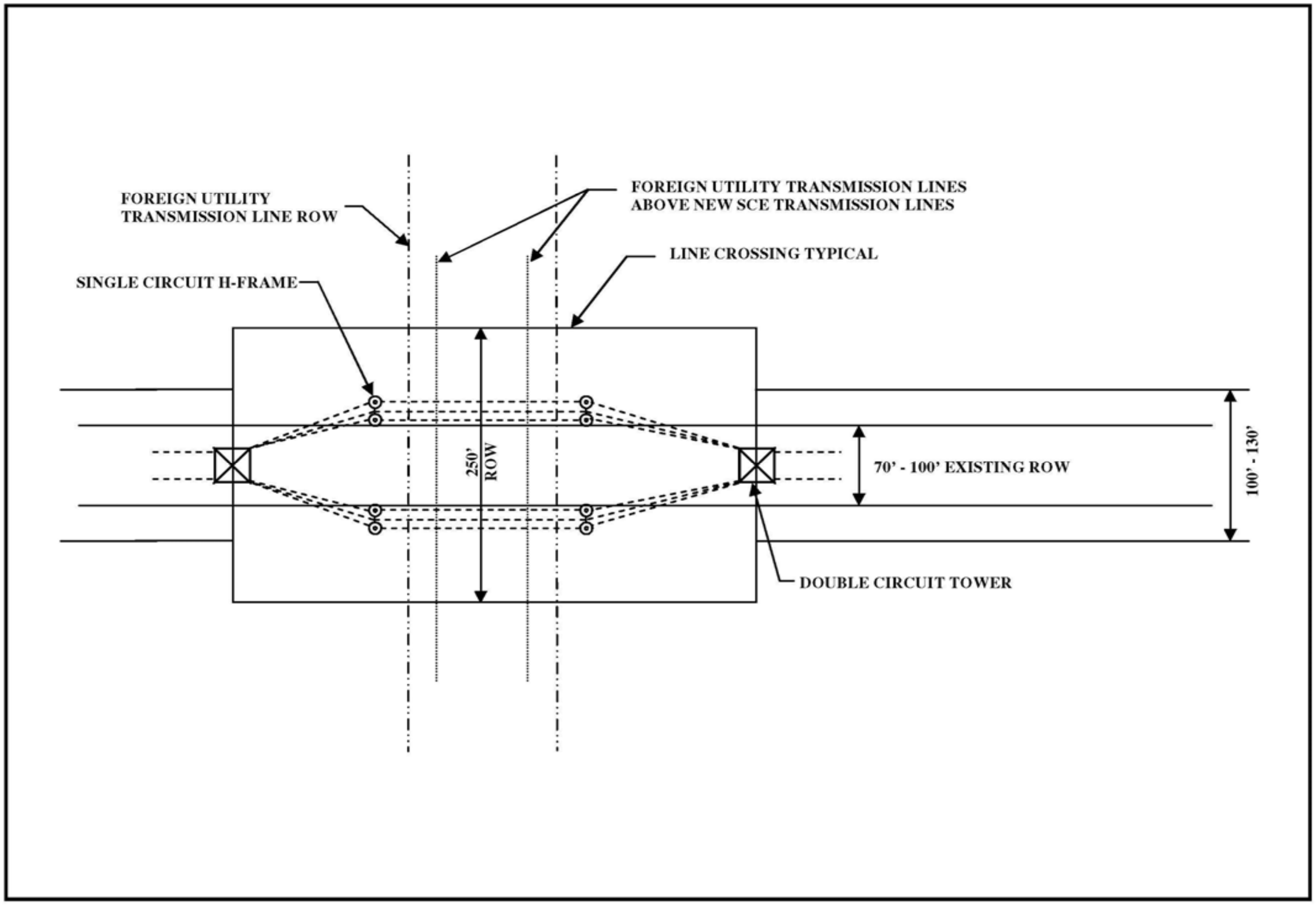

Figure 3.2-1. Typical Eldorado-Ivanpah 220kV Transmission Line ROW Configuration at Foreign Utility Crossings

TABLE 3-1 ELDORADO-IVANPAH 220kV TRANSMISSION LINE SUMMARY						
	Proposed Eldorado-Ivanpah 220kV Trans-mission/ Line Route	**Eldorado-Ivanpah 220kV Trans-mission/ Line Alternative Route A**	**Eldorado-Ivanpah 220kV Trans-mission/ Line Alternative Route B**	**Eldorado-Ivanpah 220kV Trans-mission/ Line Alternative Route C**	**Eldorado-Ivanpah 220kV Trans-mission/ Line Alternative Route D**	**Eldorado-Ivanpah 220kV Trans-mission/ Line Alternative Route E**
Dimensions						
Length of Line (miles)	34.7	33.8	38.4	35.4	35.1	35.1
Alternate Route Segment Length (miles)	N/A	5.0	5.7	5.5	3.5	3.0
Portion of Proposed Route that Alternate Route Replaces (miles)	N/A	6.0	2.0	4.5	3.0	2.5
New Permanent Area Occupied (acres)						
Structure Footings Proposed and Complete Alternate Routes (1)	36.8	35.5	41.3	37.9	36.9	37.0
Alternate Route Segment	N/A	4.9	7.4	5.3	3.2	2.9
Area Difference in Structure Footing Area Compared to the Proposed Route	N/A	-1.3	+4.5	+1.1	+0.1	+0.2
Access Roads	0	0	0	1.6	0	0
Spur Roads	2.1	3.6	1.0	1.1	0.7	0.6
Ivanpah Substation (2)	0	0	0	0	0	0
Eldorado Substation (3)	0	0	0	0	0	0
115kV Subtransmission	1.0	1.0	1.0	1.0	1.0	1.0
33kV Distribution	0.4	0.4	0.4	0.4	0.4	0.4
Telecommunications (3)/(4)/(5)/(6)	0/0.3/ 0.1/0.1	0/0.3/ 0.1/0.1	0/0.3/ 0.1/0.1	0/0.3/ 0.1/0.1	0/0.3/ 0.1/0.1	0/0.3/ 0.1/0.1
Total Permanent Area Occupied (4)/(5)/(6)/(7)	40.3/40.6/ 40.4/40.4	40.5/40.8/ 40.6/40.6	43.7/44.0/ 43.8/43.8	42.0/42.3/ 42.1/42.1	39.0/39.3/ 39.1/39.1	39.0/39.3/ 39.1/39.1
New Temporary Area Occupied (acres)						
Transmission Line Structures, Proposed and Complete Alternate Routes (1)	256.8	273.7	305.0	286.6	282.0	282.0
Alternate Route Segments	N/A	29.4	41.3	31.2	19.3	17.4
Area Difference in Transmission Line Structures Compared to the Proposed Route	N/A	-7.4	+23.9	+5.5	+0.9	+0.9
Construction yards, pulling/splicing and batch plant areas, Proposed and Complete Alternative Routes	141.9	141.5	171.4	150.9	144.9	144.9
Substation (2) (3)	0	0	0	0	0	0
115kV Subtransmission	7.3	7.3	7.3	7.3	7.3	7.3
33kV Distribution	2.0	2.0	2.0	2.0	2.0	2.0
Telecommunications(3)/(4)/(5)/ (6)	0.2/18.4/ 21.4/21.2	0.2/18.4/ 21.4/21.2	0.2/18.4/ 21.4/21.2	0.2/18.4/ 21.4/21.2	0.2/18.4/ 21.4/21.2	0.2/18.7/ 21.4/21.2
Total Temporary Area Occupied (acres) (rounded to 0.5 acre)	408.0/ 426.0/ 429.0/429.0	425.0/ 443.0/ 446.0/446.0	486.0/ 504.0/ 507.0/ 507.0	447.0/ 465.0/ 468.0/ 468.0	436.0/ 454.0/ 457.0/457.0	436.0/ 455.0/ 458.0/458.0

TABLE 3-1 ELDORADO-IVANPAH 220kV TRANSMISSION LINE SUMMARY						
	Proposed Eldorado-Ivanpah 220kV Trans-mission/ Line Route	**Eldorado-Ivanpah 220kV Trans-mission/ Line Alternative Route A**	**Eldorado-Ivanpah 220kV Trans-mission/ Line Alternative Route B**	**Eldorado-Ivanpah 220kV Trans-mission/ Line Alternative Route C**	**Eldorado-Ivanpah 220kV Trans-mission/ Line Alternative Route D**	**Eldorado-Ivanpah 220kV Trans-mission/ Line Alternative Route E**
Number of Structures (approximate)						
New Double-Circuit Lattice Steel Structures	216	30	33	34	21	19
New Single-Circuit H-Frame Structures	42	4	24	0	0	0
Overall Difference in Structure Count Compared to the Proposed Route	N/A	-7	+31	+6	+1	+1
Total	258	34	57	34	21	19
Land Ownership (miles) (8)						
Land Ownership (miles), Alternate Route Segment						
Federal, BLM -California	N/A	0.0	0.0	3.2	1.4	0.0
Federal, BLM - Nevada	N/A	0.0	0.0	1.8	1.3	0.1
Private - California	N/A	0.0	0.0	0.0	0.0	0.0
Private - Nevada (9)	N/A	5.0	5.8	0.3	0/6	0.4
Land Ownership (miles) – Proposed and Alternate Route Segment						
Federal, BLM - California	6.1	6.1	6.1	6.5	6.3	6.3
Federal, BLM - Nevada	20.3	20.0	20.0	21.4	21.0	21.0
Private - California	0.0	0.0	0.0	0.0	0.0	0.0
Private - Nevada (9)	8.6	7.7	12.3	7.5	7.8	7.8
Total	35	33.8	38.4	35.4	35.1	35.1
ROW (miles)						
Existing Transmission Line ROW	35	2.7	0.0	0.0	0.0	0.0
New Transmission Line ROW	35	5.0	5.6	5.2	3.2	0.7
Number of Crossings						
Primary highways	1	0	0	1	1	1
Secondary highways	8	0	0	0	2	2
Rivers and streams	0	0	0	0	0	0
Railroads	1	0	0	0	0	0

NOTES:

(1) Does not include overlapping area between structure removal and new structure installation.

(2) The grading and other ground disturbing activities of the Ivanpah Substation site would be approved under the application of BrightSource with the California Energy Commission for their solar power generation facility.

(3) All work will be done within the existing fence line.

(4) Proposed telecommunication system Path 1.

(5) Telecommunication system, including Path 2-Section1, Section 2, and Section 3A.

(6) Telecommunication system, including Path 2-Section 1, Section 2 and Section 3, Shared Alternate 1 and 2, and Section 3, Alternate 1.

(7) Telecommunication system including Path 2-Section 1, Section 2, and Section 3, Shared Alternate 1 and 2, and Section 3, Alternate 2.

(8) There is no land under the jurisdiction of the state of California or Nevada.

(9) Located in Boulder City jurisdiction.

Note: See Land Disturbance Tables (Tables 3.2 to 3.7) for factors used to determine area estimates. Areas occupied by facilities installed within existing substation and communications site properties are not included in estimates.

The existing line then travels west for approximately 3.6 miles (Milepost 10.7, Tower74) and crosses under the existing LADWP Intermountain-Adelanto +/-500kV DC transmission line twice at sharp angles. However, at both existing crossing locations, a 250-foot ROW would be needed to accommodate the steel H-frame structures that would be necessary to cross under the +/-500kV DC transmission line. However, there is not adequate space to fit the 250-foot ROW. Therefore, the new line must be rerouted for approximately 0.4 mile on the northern side of the +/-500kV DC transmission line, eliminating the need for both of the crossings.

The existing line then parallels the LADWP Intermountain-Adelanto +/-500kV DC transmission line for approximately 0.9 mile before crossing under the +/-500kV DC transmission line. The crossing occurs at a sharp angle and there would not be adequate space to widen the existing ROW to 250 feet for the side-by-side 220kV steel H-frame structures. Therefore, the new line must be rerouted along the north side of the +/-500kV DC transmission line. The line turns toward the south and cross under the +/-500kV DC transmission line where there is adequate space for the necessary 250-foot ROW, and then it turns toward the west and rejoins the existing ROW.

The line continues southwest for approximately 13.0 miles (Milepost 24.8, Tower 170) before crossing over one existing 115kV transmission line and under the LADWP's McCullough-Victorville No.1, and McCullough-Victorville No.2 500kV transmission lines and Mead-Victorville 287kV transmission line. At the crossing of the second and third 500kV transmission lines (McCullough-Victorville 2 500kV transmission line and the Mead-Victorville 287kV transmission line), there is not adequate space to widen the existing ROW for side-by-side 220kV steel H-frame structures. As required on the previous crossing, the new line must be rerouted along the north side of the McCullough-Victorville 2 500kV transmission line, then turn towards the south and cross under the Mead-Victorville 287kV transmission line, then turn towards the west and rejoin the existing ROW.

The line continues on the existing Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV ROW for another 7.8 miles into the proposed Ivanpah Substation. The proposed route terminates at the Ivanpah Substation.

3.2.2 Alternative Route Descriptions

3.2.2.1 Alternative Route A (Segment parallel to Los Angeles Department of Water and Power Transmission Line)

The purpose of Alternative Route A is to bypass a segment of line that runs north and south near Milepost 2.0, approximately 0.83 mile in the City of Boulder where it is unclear as to whether or not the route is located in a designated BLM utility corridor. Alternative Route A was created to bypass this segment by heading west and then north to join the existing ROW.

The Eldorado-Ivanpah 220kV Transmission Line Alternative Route A (Figure 3.1-1, located in the Map Volume) begins at the Eldorado Substation. The line exits the substation to the north and joins the existing SCE Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass ROW. The line would head generally west on a 130-foot ROW, cross three LADWP transmission lines (McCullough-Victorville 1 500kV transmission line, McCullough-Victorville 2 500kV transmission line, and the Mead-Victorville 287kV transmission line) to the north before heading west again.

Prior to turning north, there is one more LADWP 500kV transmission line (Marketplace-Adelanto 500kV transmission line) crossing. Alternative Route A would continue west for approximately 5.0 miles on new ROW, and then turn north for approximately 1,000 feet before crossing the LADWP Marketplace-Adelanto 500kV transmission line and joining the existing ROW. At this point refer to the description of the proposed route, paragraph three for continuation of the Alternative Route A description to the proposed Ivanpah Substation.

3.2.2.2 Alternative Route B (North of Eldorado Substation)

The purpose of Alternative Route B is to bypass a segment of line that runs north and south near Milepost 2.0, approximately 0.83 mile in the City of Boulder where it is unclear as to whether or not the route is located in a utility corridor. Alternative Route B was created to bypass this segment by heading north and then southwest to join the existing ROW.

Alternative Route B (Figure 3.1-1, located in the Map Volume) begins at the Eldorado Substation. The line exits the substation to the north and parallels the Eldorado-Mead 220kV transmission line on existing ROW for approximately 2.5 miles before turning southwest. It then traverses for approximately 2.8 miles and re-joins the existing SCE Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line ROW at Milepost 2, Tower 20. At this point refer to the description of the proposed route, paragraph 2 for continuation of the Alternative Route B description to the proposed Ivanpah Substation. (To reach this point, there are numerous utility transmission line crossings that need to be made. It is anticipated that several of these overhead utility lines may have to be modified or relocated to accommodate passage of the transmission line on Alternative Route B).

3.2.2.3 Alternative Route C (North Dry Lakes Reroute)

Alternative Route C was a result of suggestions by the BLM to minimize impacts to the Ivanpah Dry Lake. Alternative Route C (Figure 3.1-1, located in the Map Volume) begins at the Eldorado Substation and follows the proposed route to the point (Milepost 27, Tower 185) where the line reaches the northeastern edge of the Ivanpah Dry Lake. The transmission line would be re-routed west and southwest on new 130-foot ROW around Ivanpah Dry Lake for approximately 5.3 miles before rejoining the existing ROW at Milepost 32, Tower 218.

3.2.2.4 Alternative Route D (South Dry Lakes Reroute)

Alternative Route D is a result of suggestions by the BLM to minimize impacts to the Ivanpah Dry Lake. Where feasible, Alternative Route D will parallel structure for structure the existing LADWP Marketplace-Adelanto 500kV transmission line through the Ivanpah Dry Lake.

Alternative Route D (Figure 3.1-1, located in the Map Volume) begins at the Eldorado Substation and follows the proposed route to the point (Milepost 27, Tower 184) where the line reaches the northeastern edge of the Ivanpah Dry Lake. The line will be re-routed west and southwest on new 130-foot ROW around Ivanpah Dry Lake for approximately 3.3 miles before rejoining the existing ROW at Milepost 30, Tower 203. The line will parallel the LADWP Marketplace-Adelanto 500kV transmission line as it crosses through the Ivanpah Dry Lake.

3.2.2.5 Alternative Route E (South Ivanpah Dry Lake Bypass Reroute)

Alternative Route E is a result of suggestions by the BLM to minimize impacts to the Ivanpah Dry Lake. Alternative Route E leaves the proposed route at approximately Milepost 27 and proceeds southerly for approximately 1.0 mile on new 130-foot ROW before intercepting Alternative Route D at approximately Milepost 1. The route bypasses Ivanpah Dry Lake completely.

3.2.3 Structures and Line Components

Details on structures and line components described are based on planning level assumptions and may change following completion of preliminary and final engineering, identification of field conditions, availability of labor, material, and equipment, and any environmental and permitting requirements.

The proposed 220kV transmission line would have two circuits of conductor. Each circuit is composed of three phases. Each phase consists of two 1,590 kcmil conductors. The 1,590 kcmil (Lapwing) conductors are made of aluminum strands with internal steel reinforcement. The conductor will have a non-specular finish.

For the proposed route, it is estimated that approximately 216 dulled galvanized double-circuit 220kV LSTs (Figure 3.2-2) and approximately 42 dulled galvanized 220kV steel H-Frames structures (Figure 3.2-3) would be installed. The estimated number and type of structures for the proposed and alternative routes are presented in Table 3-1. The double-circuit LSTs would range in height between 110 feet and 180 feet. The single-circuit steel H-Frame structures would range in height between 45 feet and 75 feet. Most of the structure sites would require minor to substantial grading and new or re-developed access and spur roads.

Each four-legged LST would be built on four drilled poured-in-place concrete footings. Each steel H-Frame structure would be built on two drilled poured-in-place concrete footings. The dimensions of each footing are dependent on variables such as topography, structure height, span lengths, and soil properties. On average, a typical footing would have an above ground projection of approximately 1 to 4 feet.

The tangent and small angle 220kV suspension hardware assembly would contain a single polymer insulator, one assembly per phase for six phases. On dead-end structures, the assembly would contain two polymer insulators, one assembly per phase for six phases.

The OHGW would be located on the peaks of the transmission structures. The new 220kV structures would have a single OHGW, approximately 0.7 inch in diameter. OPGW is the proposed material to be used.

As part of the diverse telecommunication route, approximately 25 miles of the existing SCE Lugo-Eldorado 500kV transmission line will need to have one of the two existing 0.5-inch steel ground wires replaced with OPGW. It is estimated that approximately 45 structures along this route will require structural modifications either at the static peaks or mid to upper body or both to accommodate the replacement.

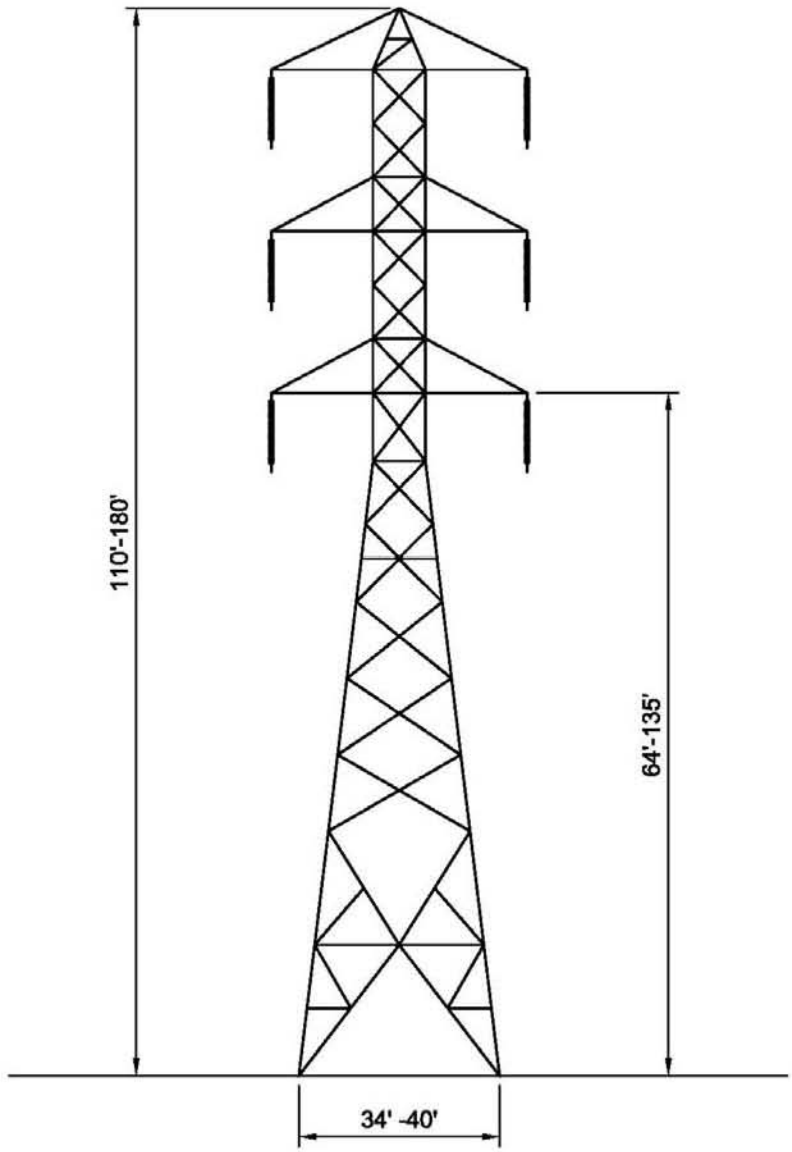

FIGURE 3.2-2: 220KV DOUBLE-CIRCUIT LATTICE-STEEL TOWER

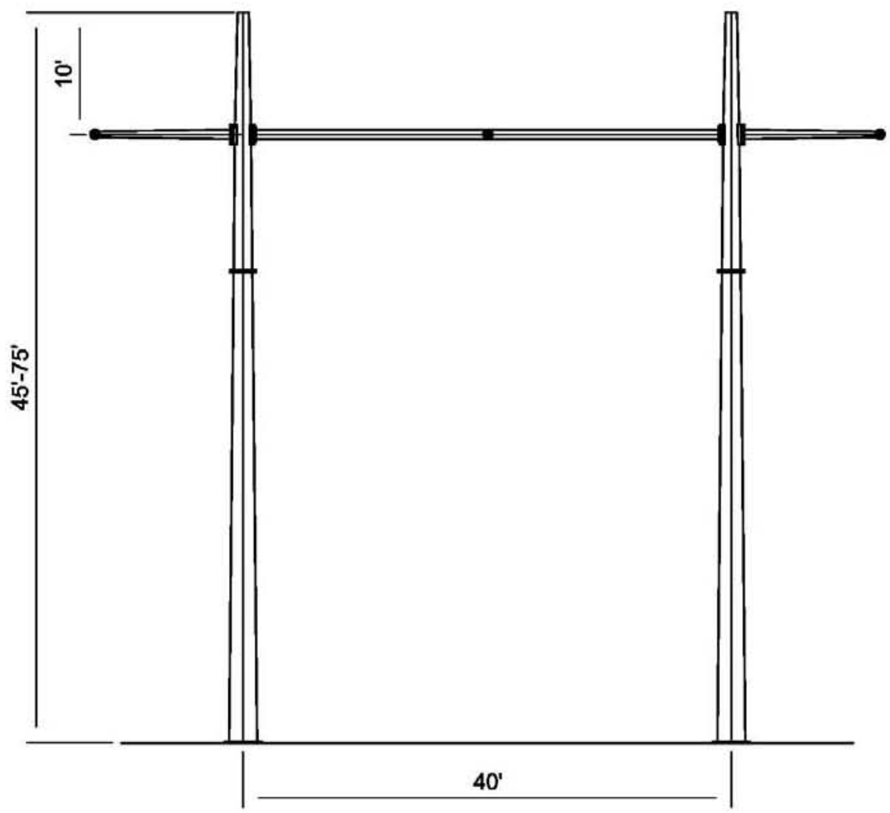

FIGURE 3.2-3: 220KV SINGLE-CIRCUIT H-FRAME

In order to maintain ground clearance and other utilities conductor clearances when line crossings are necessary, shield wire on the 220kV Eldorado-Ivanpah circuits may not be installed.

Existing 115kV structures on the 35.5-mile Eldorado-Ivanpah portion of the existing SCE Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line would be removed.

At Milepost 28.5 (near Tower 195), the new 130-foot ROW crosses from Clark County, Nevada into San Bernardino County, California. All portions of the transmission line located within the State of California are designed to General Order 95 (GO 95) standards. All portions of the transmission line located within the State of Nevada are designed to National Electric Safety Code (NESC) standards.

3.2.4 Access Roads

Construction of a new transmission line requires access to each structure site for construction crews, materials, and equipment. Existing access roads would be used to construct the Project. Except for Alternative Route C, no new access roads would be required. Some of the structure sites would require new or re-developed spur roads. Approximately 1.2 miles of new spur roads would be required for the Proposed Project route. Wherever possible, existing streets, access roads, and spur roads would be used for construction of the Proposed Project. Where needed, existing access roads would be improved as required. After Project construction, these roads would be used by maintenance crews and repair vehicles for access to each structure for inspection and maintenance activities.

At the end of Project construction, these roads would be left in a condition equal to or better than the condition that existed prior to the start of construction. Loose rock and slide material would be removed from existing roads and used to construct dikes, fill washouts, or flatten fill slopes. All washouts, ruts, and irregularities would be filled or obliterated.

Access and spur road gradients would be leveled so that any sustained grade does not exceed 12 percent. Grades of approximately 14 percent would be permitted when such grades do not exceed 40 feet in length and are located more than 50 feet from any other excessive grade or any curve.

All curves would have a radius of curvature of not less than 50 feet, measured at the center line of the usable road surface. All dead-end spur roads over 500 feet long would include a Y-type or circle-type turnaround.

Access and spur roads are generally a minimum of 14 feet wide dirt but may be wider depending on final engineering requirements and field conditions. The main access road follows the transmission ROW with spur roads branching off to each structure location. Spur roads would be needed at new structure locations. Spur roads would be an average of 200 feet long and would usually have turnaround areas near the structure locations. Longer or slightly wider spur roads may be needed in some locations.

Existing access roads would be maintained so as to permit their being used by construction equipment. Some road modifications may be required to allow use of heavy equipment.

3.2.5 Right-of-Way

Approximately 35 miles of upgraded ROW would be required for the proposed route. 5.0 miles of new ROW would be required for Alternative Route A. 5.6 miles of new ROW would be required for Alternate Route B, 5.2 miles of new ROW for Alternate Route C, 3.2 miles of new ROW for Alternative Route D, and 0.7 mile for Alternative Route E.

3.3 115KV SUBTRANSMISSION LINE

An approximately 600- to 800-foot-long new section of looped 115kV line consisting of 653.9 ACSR and two 3/8-inch-high strength galvanized shield wire will be strung from a connection point (Milepost 34) on the existing SCE Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV line to a new rack position at the proposed Ivanpah Substation. The new line section will create the SCE Coolwater-Baker-Dunn Siding-Mountain Pass-Ivanpah 115kV line. The new section of transmission line will consist of 653.9 ACSR conductors, one conductor per phase, three phases per circuit. From the connection point (Milepost 34) south for approximately 1 mile, 7 existing H-frame lattice structures will be removed and replaced with 1 TSP (Figure 3.3-1) and 6 light weight steel (LWS) H-frames (Figure 3.3-2). In addition, six new LWS H-frames will have to be interset at midspan of these structures to meet current requirements as well. Existing 4/0 ACSR conductor will be transferred and new structures will include two 3/8-inch-high strength shield wires. Structure heights are approximately 60 to 75 feet above ground with a span length of 150 to 450 feet, depending on topography. An estimated 300 feet of new spur roads would be required.

3.3.1 115kV Subtransmission Line Removal

Initial work activities will consist of removing approximately 250 existing structures of various construction designs as presented below. Removal will include line conductor and bisector anchors, and concrete caps. Steel lattice structure footings, concrete caps, and anchors will be cut/removed 1 foot to 2 feet below ground level.

150	Lattice H-Frame suspension/dead end
1	Lattice H-Frame concrete footings
2	Lattice H Frame with storm guys
4	Lattice H-Frame concrete footings and storm guys
19	Lattice H-Frame with four storm guys
26	Lattice H-Frame concrete footings with four storm guys
5	Lattice H-Frame with six storm guys
1	Lattice H-Frame concrete footings with six storm guys
13	Four-legged lattice structure
23	Wood Pole H-Frame set in (corrugated metal pipe [CMP])
5	3 Pole Wood Structures set in CMP
1	Single Pole Berry

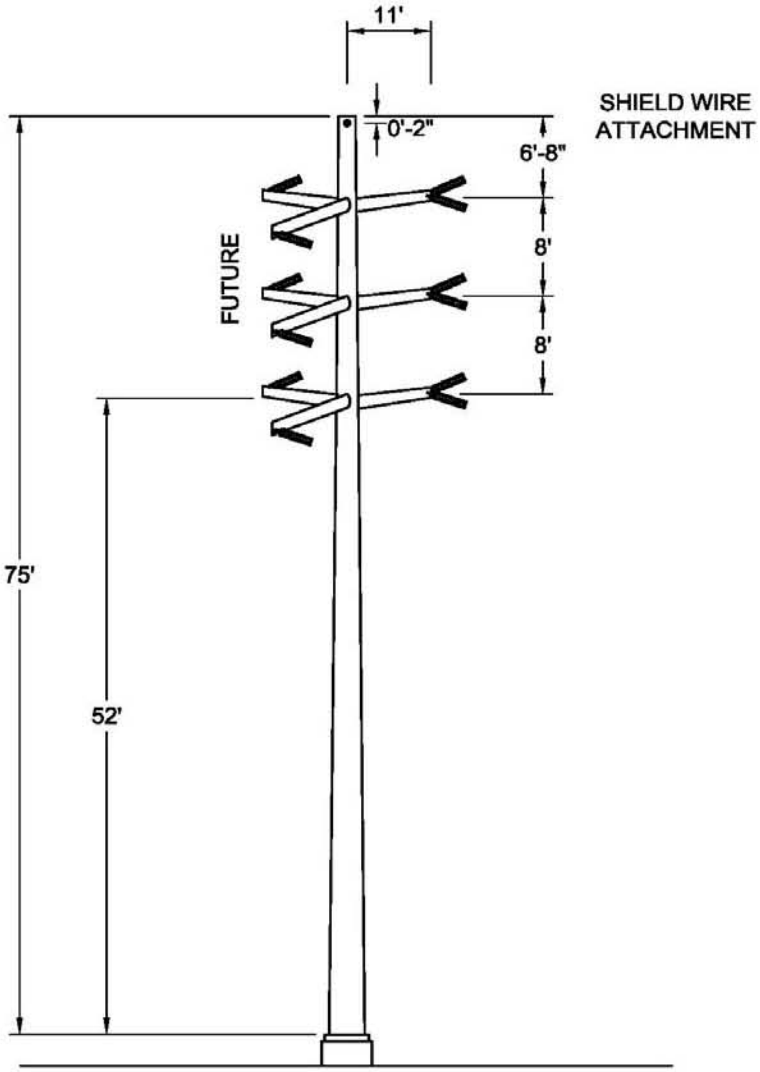

FIGURE 3.3-1: 115KV SINGLE-CIRCUIT ENGINEERED TUBULAR STEEL POLE

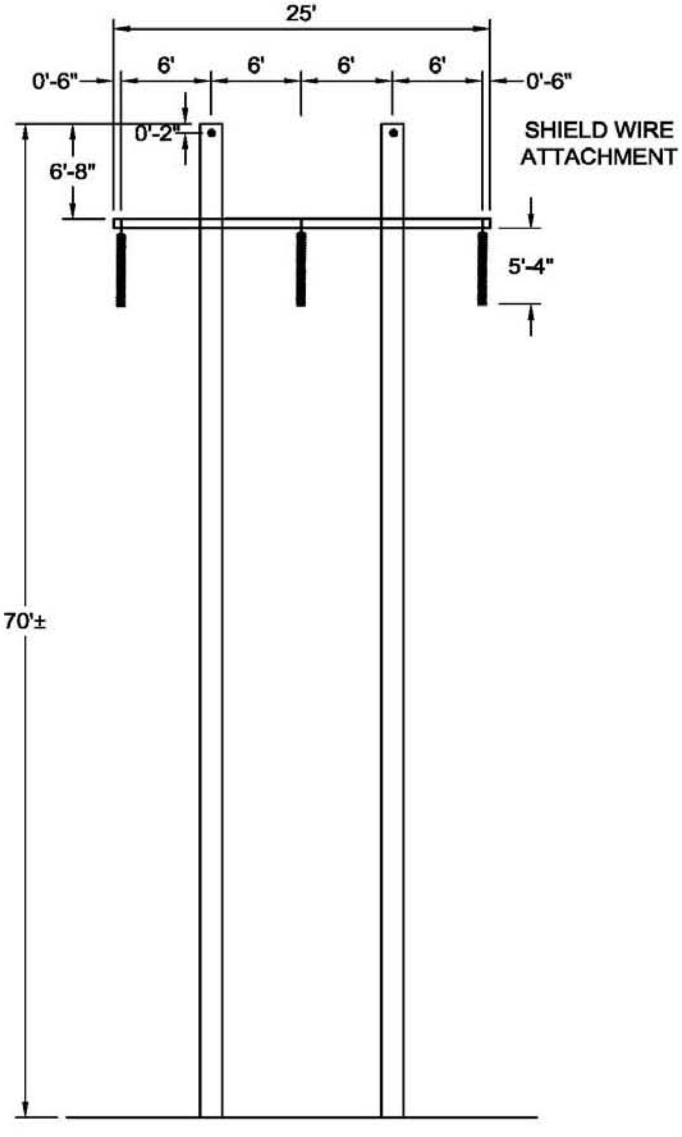

FIGURE 3.3-2: LIGHT WEIGHT 115KV H-FRAME TUBULAR STEEL POLE

3.4 33kV DISTRIBUTION LINE

A 33kV distribution system would be constructed to provide light and power to the Ivanpah Substation. The station light and power will be contained in approximately 400 feet of new ducts and one run of 4/0 Cross-link Polyethylene (CLP) from the Nipton 33kV circuit to the location of the new station light and power transformer in the Ivanpah Substation. The location of the transformer will be decided by substation engineering.

About 1 mile of new underground 33kV circuitry and two new Remote Control Switches (RCS) would be installed to close the loop in the Nipton 33kV circuit. The addition will consist of two ducts and one run of 4/0 CLP. The proposed work will be done next to Densmore Drive Road. One of the RCS will be located south of the Ivanpah Substation and the second RCS will be located next to the Primm Golf Course.

3.5 SUBSTATIONS

3.5.1 Ivanpah 220/115kV Substation

The proposed 220/115kV Ivanpah Substation (Figure 3.5-1) would be constructed to accommodate an ultimate 1120 MVA facility to be owned, operated, and maintained by SCE. This ultimate configuration requires a fenced area of 885 feet by 850 feet with a 10-foot-wide perimeter buffer outside the fence; areas devoted to cut and fill side slopes to accommodate grading would total approximately 19 acres of disturbed land. Two areas measuring approximately 1,015 feet by 400 feet containing approximately 9 acres each would be located to the westerly and easterly ends of the substation site and would provide access for the 220kV and 115kV lines into the substation. Ground disturbance within these areas would be limited to that needed for construction and access to the structures/poles located within the areas. The total substation site area would be approximately 1,650 feet by 1,015 feet, consisting of approximately 38.5 acres.

The grading of the Ivanpah Substation site would be completed under the application of BrightSource with the CEC for their solar power generation facility. This component would include the 885-foot by 850-foot substation site, the 10-foot perimeter buffer, and the area containing cut and fill slopes resulting from grading. In addition a 24-foot-wide paved road would be included to provide vehicular access to the substation, fencing, a portion of the 115kV switchrack, an emergency generator, the mechanical electrical equipment room (MEER) approximately 65 feet by 55 feet, and an approximately 180-foot-tall microwave tower.

The ultimate configuration would include four 280 MVA 220/115kV transformer banks, eight 220kV and fourteen 115kV positions. The initial configuration of the substation would include a total of three 280 MVA 220/115kV transformer banks, five 220kV and four 115kV lines, and associated switchracks. A 180 feet tall microwave tower would be installed as part of the Eldorado-Ivanpah Project.

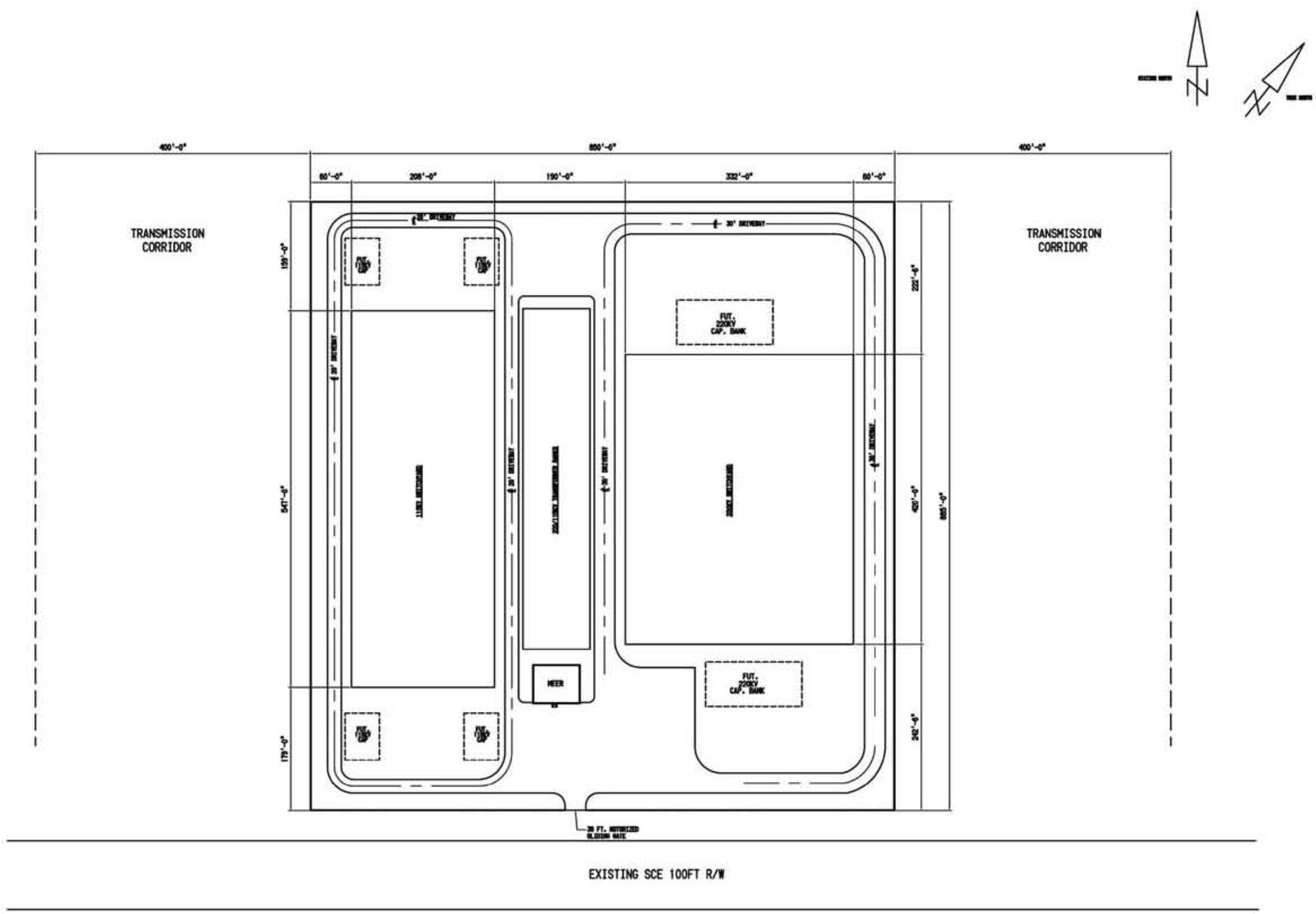

FIGURE 3.5-1 IVANPAH SUBSTATION PLOT PLAN

3.5.2 Eldorado 500/220/115kV Substation

The existing Eldorado Substation is located approximately 14 miles southwest of Boulder City in the State of Nevada. The Project requires two 220kV line positions to terminate the new Ivanpah No.1 and No.2 220kV transmission lines. The installation of the two additional positions requires that the existing 220kV switchyard be extended 165 feet to the West within the existing substation fence. No surface grading is required for this extension. Upgrades to existing 220 kV circuit breakers and upgrades to 500 kV series capacitors within the existing substation fence may also be required, depending on electrical system requirements. An existing 220/115kV transformer bank would be removed.

3.6 TELECOMMUNICATIONS SYSTEM

The Proposed Project would require construction of two fully diverse and redundant communication paths to support both a special protection system that would trip the SCE Eldorado-Ivanpah 220kV transmission line relays under specific outage contingencies as well as for the operating and monitoring of the substation and transmission line equipment. The paths would connect the Eldorado Substation to the proposed Ivanpah Substation. New telecommunication infrastructure would be installed to provide protective relay circuit, SCADA circuit, data, and telephone services to the proposed Ivanpah Substation. The following sections describe the proposed new telecommunication infrastructure.

3.6.1 Telecommunication Paths

The communication link between the Eldorado Substation and the proposed Ivanpah Substation consists of two diverse telecommunication paths referred to as Path 1 and Path 2. Both paths are shown in Figure 3.1-1 (located in the Map Volume) and are described below.

3.6.1.1 Path 1

The first telecommunication path (Path 1) from the Eldorado Substation to the proposed Ivanpah Substation uses new OPGW along the proposed Eldorado-Ivanpah 220kV transmission line to be constructed from the Eldorado Substation to the Ivanpah Substation. The approximate length of the path is 34.7 miles.

3.6.1.2 Path 2

The second telecommunication path (Path 2) from the Eldorado Substation to the Ivanpah Substation consists of the following three sections as shown in Figure 3.1-1 (located in the Map Volume).

Path 2-Section 1

The Path 2-Section 1 route extends from the Eldorado Substation to a 500kV tower (M152-T2) of the existing SCE Eldorado-Lugo 500kV transmission line near the intersection of Highway 164 and the 500kV ROW. Approximately 25 miles of the existing SCE Eldorado-Lugo 500kV transmission line would have one of the two existing .5-inch steel OHGW replaced with OPGW. Approximately 45 of the existing structures along this route will require some form of structural modifications, either at the static peaks, or mid to upper body, or both, to accommodate the replacement of the OHGW with OPGW. The loading capacity of modified structures with the new OPGW would conform to GO 95 loading criteria. The exact number of structures and the specific type of modifications will be determined once final engineering has been completed. All construction work for the structure modifications would be performed within the existing access road and ROW.

Path 2-Section 2

The Path 2-Section 2 route extends in an underground duct from the SCE Eldorado-Lugo 500kV transmission line tower (M152-T2) to the town of Nipton. Tower M152-T2 is located approximately 4.8 miles east of the town of Nipton, on the north side of Highway 164. The Path 2-Section 2 route would parallel Nipton Road on the north side in an underground duct that would be installed along a new roadside ROW.

Path 2-Section 3

Section 3 of Path 2 is from the town of Nipton to the Ivanpah Substation. It has a preferred route (Section 3A) and two alternate routes.

Path 2-Section 3A (Preferred Route)

The preferred route from the town of Nipton to the Ivanpah Substation is via a microwave transmission system over 12 miles of microwave path (Path 2-Section 3A). A communication site northeast of the town of Nipton would be built to maintain an approximately 180-foot-tall microwave tower. The communication site would be approximately 100 feet by 100 feet. The Path 2-Section 2 fiber cable would extend from the town of Nipton in an underground duct that would terminate at the communication site. A distribution line would be extended from the town of Nipton to the communication site for power connection. At the Ivanpah Substation, a microwave tower approximately 180 feet tall would be built to link to the Nipton communication site via the air microwave path.

Path 2-Section 3-Alternates 1 and 2

Path 2-Section 3-Alternates 1 and 2 share the same route west from the town of Nipton to the Nipton Road and I-15 junction point. From the I-15 and Nipton Road junction point, Alternatives 1 and 2 take divergent courses, both following the existing Nipton 33kV distribution line to the Ivanpah Substation.

Alternatives 1 and 2 from Nipton to the I-15 junction point are a combination of ADSS fiber cable on existing Nipton 33kV wood pole lines and underground fiber cable. Approximately 1 mile of ADSS fiber cable would be installed on the existing Nipton 33kV distribution line immediately west of Nipton, on the north side of Nipton Road. An unknown number of poles may need to be replaced to meet the new loading requirement of the ADSS fiber cable.

From the westernmost pole on the Nipton line before it crosses Nipton Road to the south, fiber optic cable would be installed in an underground duct along the north side of Nipton Road in new roadside ROW to the intersection of Nipton Road and I-15. The estimated underground cable length for this segment is approximately 9 miles.

Path 2-Section 3-Alternate 1

From the I-15 junction point, there are two alternate routes to the Ivanpah Substation. The Alternate 1 route parallels I-15 in an underground duct for approximately 1.0 mile and then on the existing Nipton 33kV distribution line poles west to the town of Mountain Pass, then north to the Mountain Pass Substation. From the Mountain Pass Substation, the cable route turns in a northeast direction, and proceeds on the existing Nipton 33kV distribution line poles to the Ivanpah Substation. The route enters the substation from the south side. Approximately 500 feet of underground conduit would be installed from the last Nipton 33kV distribution line pole to the Ivanpah Substation to support the entry of fiber cable into the south side of Ivanpah Substation. The Alternate 1 route from the I-15 junction point to the Ivanpah Substation is approximately 15.0 miles.

Path 2-Section 3-Alternate 2

From the I-15 junction point, the Alternate 2 route parallels I-15 in a northerly direction on existing Nipton 33kV distribution line poles, crosses over I-15 near the Primm Golf Course, and crosses the golf course in an underground duct. After leaving the golf course, the route continues on existing Nipton 33kV distribution line poles to a point approximately 1.0 mile from the Ivanpah Substation where it would be installed in an underground duct for approximately 1.0 mile to enter the north side of the Ivanpah Substation. The Alternate 2 route from the I-15 junction point to the Ivanpah Substation is approximately 10.0 miles.

3.6.2 Ivanpah Substation Communication Room

A dedicated communications room would be included within the Ivanpah Substation MEER to house communication equipments. The communication room would be equipped with AC power, batteries and a battery charger, an overhead cable tray, redundant air conditioners, and conduits for connection to fiber optic cables. For telecommunication circuits, fiber terminating shelves, fiber optic transport terminals, channel equipment shelves, communications alarm/switch, and one DC power system would be installed in the communication room.

3.6.3 Mountain Pass Substation Communication Enclosure

Dedicated communication enclosures would be included within the Mountain Pass Substation located 6.0 miles southwest of the Proposed Ivanpah Substation to house communication equipment. This communication equipment is required as a repeater to re-generate the optical signals from/to Eldorado via telecommunication Path 2-Section 3-Alternate 1 (Figure 3.1-1, located in the Map Volume). The communication enclosures would be equipped with AC power interface, batteries and battery chargers, air conditioners, and conduits for connection to fiber optic cables from distribution pole lines.

3.7 220KV TRANSMISSION LINE CONSTRUCTION ACTIVITIES

The Proposed Project transmission system is discussed in Sections 3.2, 3.3, and 3.4. The proposed substation system is discussed in Section 3.5 and the telecommunications system in Section 3.6. Permanent and temporary land disturbance estimated for Project construction along the proposed and alternate transmission routes is presented in Tables 3.2 to 3.7. These estimates are based on planning level assumptions. Exact details would be determined following completion of preliminary and final engineering, identification of field conditions, availability of labor, material, and equipment, and compliance with applicable environmental and permitting requirements.

3.7.1 Eldorado-Ivanpah 220kV Transmission Line

The targeted operating date is July 2013. Work activities would commence upon approval of the Proposed Project by the CPUC, BLM and other permitting agencies. Construction is currently scheduled to commence in the last quarter of year 2011 and take approximately 19 months to complete, including time to inspect and test the project. To facilitate renewable interconnections, efforts will be made to accelerate the operating date through shorter agency decision time and compressed procurement and construction schedules. In populated areas, SCE would post notices on the ROW or at other sites where the public would be affected by construction activities. Notices would be posted approximately 1 month prior to commencing work. At ROW ingress and egress points, postings would be placed along the ROW and at work sites approximately 2 weeks prior to the closing of public access.

3.7.1.1 Proposed Construction and Restoration Measures

The Applicant Proposed Measures (APM) dealing with general construction procedures are presented in Section 4.0 of this PEA. Environmental resources and site-specific mitigation measures developed as the result of the environmental analysis of the Proposed Project are presented in Section 4.0 of this document.

3.7.1.2 Labor and Equipment

The 220kV transmission system construction is discussed in this section, 115kV transmission system in Section 3.8, substation construction in Section 3.10, and telecommunications system construction in Section 3.11. The project will be managed by the SCE Project Management Organization utilizing both SCE and contract personnel. The estimated number of persons and types of equipment required for each phase of construction on the proposed and alternative routes is shown in Tables 3-2 through 3-8. At some stages of the Project, multiple locations would be under construction simultaneously. This may involve independent construction teams.

TABLE 3-2
ELDORADO-IVANPAH LAND DISTURBANCE – PROPOSED ROUTE

Project Feature	Site Quantity	Disturbed Acreage Calculation (L x W)	Acres Disturbed During Construction	Acres Temporarily Disturbed	Acres Permanently Disturbed
Guard Structures	16	50 feet x 75 feet	1.4	1.4	0.0
Remove Existing Lattice Steel H-Frame (1)	208	150 feet x 75 feet	53.7	53.7	0.0
Remove Existing Lattice Steel Structure (1)	13	150 feet x 75 feet	3.4	3.4	0.0
Remove Existing Wood H-Frame (1)	23	100 feet x 75 feet	4.0	4.0	0.0
Remove Existing Wood Pole (1)	6	100 feet x 75 feet	1.0	1.0	0.0
Construct New Lattice Steel Suspension Structure (2)	178	200 feet x 200 feet	163.5	137.6	25.8
Construct New Lattice Steel Dead-End Structure (2)	35	200 feet x 200 feet	32.1	25.6	6.5
Construct New Lattice Steel Heavy Dead-End Structure (2)	3	200 feet x 200 feet	2.8	2.2	0.6
Construct New Tubular Steel Double H-Frame (3)	21	200 feet x 200 feet	19.3	15.4	3.9
115kV Conductor Removal and 220kV Conductor and OPGW Stringing Setup Area - Puller (4)	23	200 feet x 150 feet	15.8	15.8	0.0
115kV Conductor Removal and 220kV Conductor and OPGW Stringing Setup Area - Tensioner (4)	24	500 feet x 150 feet	41.3	41.3	0.0
220kV Conductor Splicing Setup Areas (4)	12	150 feet x 100 feet	4.1	4.1	0.0
New Access Roads (5)	0.0	linear miles x 14 feet wide	0.0	0.0	0.0
New Spur Roads (5)	1.2	linear miles x 14 feet wide	2.1	0.0	2.1
El Dorado Sub - Material and Equipment Staging Area	1	approximately 9.83 acres	9.8	9.8	0.0
Jean, Nevada - Material and Equipment Staging Area	1	approximately 13.59 acres	13.6	13.6	0.0
Gen. Sta. Yard - Material and Equipment Staging Area	1	approximately 16.52 acres	16.5	16.5	0.0
Primm Valley Casino Vacant Lot - Material and Equipment Staging Area	1	approximately 28.28 acres	28.3	28.3	0.0
Whiskey Pete's Casino Vacant Lot - Material and Equipment Staging Area	1	approximately 2.40 acres	2.4	2.4	0.0
BrightSource General Station - Material and Equipment Staging Area	1	approximately 10.00 acres	10.0	10.0	0.0

TABLE 3-2 ELDORADO-IVANPAH LAND DISTURBANCE – PROPOSED ROUTE					
Project Feature	**Site Quantity**	**Disturbed Acreage Calculation (L x W)**	**Acres Disturbed During Construction**	**Acres Temporarily Disturbed**	**Acres Permanently Disturbed**
Total Estimated (6)			**425.1**	**386.1**	**38.9**

Notes:

1. Includes the removal of existing conductor, teardown of existing structure, and removal of foundation 2 feet below ground surface.
2. Includes foundation installation, structure assembly and erection, conductor and OPGW installation; area to be restored after construction, portion of ROW within 25 feet of the lattice steel structure to remain cleared of vegetation, would be permanently disturbed for each lattice steel structure (Suspension=0.145ac; Dead-End=0.187ac; Heavy Dead-End=0.188ac).
3. Includes structure assembly and erection, conductor and OPGW installation; area to be restored after construction, portion of ROW within 25 feet of the tubular steel double H-frame to remain cleared of vegetation, 0.185 acre would be permanently disturbed for each tubular steel double H-frame.
4. Based on 9,000-foot conductor reel lengths, number of circuits, and route design.
5. Based on length of road in miles x road width of 14 feet.
6. The disturbed acreage calculations are estimates based upon SCE's preferred area of use for the described Project feature, the width of the existing ROW, or the width of the proposed ROW and they do not include any new access/spur road information; they are subject to revision based upon final engineering and review of the project by SCE's Construction Manager and/or contractor awarded Project.

Footing/Base Volume and Area Calculations:

Heavy dead-end depth 44 feet deep, 4-foot diameter, quantity 4 per structure: earth removed for footing = 20.48 cubic yards x 4 = 81.92 cubic yards; surface area = 12.57 square feet x 4 = 50.28 square feet

Dead-end depth 32 feet deep, 3.5-foot diameter, quantity 4 per structure: earth removed for footing = 11.40 cubic yards x 4 = 45.61 cubic yards; surface area = 9.62 square feet x 4 = 38.48 square feet

Suspension depth 20 feet deep, 3.25-foot diameter, quantity 4 per structure: earth removed for footing = 6.15 cubic yards x 4 = 24.60 cubic yards; surface area = 8.30 square feet x 4 = 33.20 square feet

Double H-frame depth 40 feet deep, 6-foot diameter, quantity 4 per double H-frame: earth removed for footing = 41.89 cubic yards x 4 = 167.56 cubic yards; surface area = 28.28 square feet x 4 = 113.12 square feet

TABLE 3-3 ELDORADO-IVANPAH LAND DISTURBANCE – ALTERNATIVE A					
Project Feature	**Site Quantity**	**Disturbed Acreage Calculation (L x W)**	**Acres Disturbed During Construction**	**Acres Temporarily Disturbed**	**Acres Permanently Disturbed**
Construct New Lattice Steel Suspension Structure (2)	26	200 feet x 200 feet	23.9	20.1	3.8
Construct New Lattice Steel Dead-End Structure (2)	3	200 feet x 200 feet	2.8	2.2	0.6
Construct New Lattice Steel Heavy Dead-End Structure (2)	1	200 feet x 200 feet	0.9	0.7	0.2
Construct New Tubular Steel Double H-Frame (3)	2	200 feet x 200 feet	1.8	1.5	0.4
220kV Conductor and OPGW Stringing Setup Area - Puller (4)	2	200 feet x 150 feet	1.4	1.4	0.0
220kV Conductor and OPGW Stringing Setup Area - Tensioner (4)	3	500 feet x 150 feet	5.2	5.2	0.0
220kV Conductor Splicing Setup Areas (4)	2	150 feet x 100 feet	0.7	0.7	0.0
New Access Roads (5)	0.0	linear miles x 14 feet wide	0.0	0.0	0.0
New Spur Roads (5)	2.0	linear miles x 14 feet wide	3.5	0.0	3.5
Total Estimated (6)			**40.2**	**8**	**5**

Notes:

2. Includes foundation installation, structure assembly and erection, conductor, and OPGW installation; area to be restored after construction, portion of ROW within 25 feet of the lattice steel structure to remain cleared of vegetation would be permanently disturbed for each lattice steel structure (Suspension=0.145ac; Dead-End=0.187ac; Heavy Dead-End=0.188ac).
3. Includes structure assembly and erection, conductor, and OPGW installation; area to be restored after construction, portion of ROW within 25 feet of the tubular steel double H-frame to remain cleared of vegetation, 0.185 acre would be permanently disturbed for each tubular steel double H-frame.
4. Based on 9,000-foot conductor reel lengths, number of circuits, and route design.
5. Based on length of road in miles x road width of 14 feet.
6. The disturbed acreage calculations are estimates based upon SCE's preferred area of use for the described Project feature, the width of the existing ROW, or the width of the proposed ROW and, they do not include any new access/spur road information; they are subject to revision based upon final engineering and review of the Project by SCE's Construction Manager and/or Contractor awarded Project.

Footing/Base Volume and Area Calculations:

Heavy dead-end depth 44 feet deep, 4-foot diameter, quantity 4 per structure: earth removed for footing = 20.48 cubic yards x 4 = 81.92 cubic yards; surface area = 12.57 square feet x 4 = 50.28 square feet

Dead-end depth 32 feet deep, 3.5-foot diameter, quantity 4 per structure: earth removed for footing = 11.40 cubic yards x 4 = 45.61 cubic yards; surface area = 9.62 square feet x 4 = 38.48 square feet

Suspension depth 20 feet deep, 3.25-foot diameter, quantity 4 per structure: earth removed for footing = 6.15 cubic yards x 4 = 24.60 cubic yards; surface area = 8.30 square feet x 4 = 33.20 square feet

Double H-frame depth 40 feet deep, 6-foot diameter, quantity 4 per double H-frame: earth removed for footing = 41.89 cubic yards x 4 = 167.56 cubic yards; surface area = 28.28 square feet x 4 = 113.12 square feet

TABLE 3-4 ELDORADO-IVANPAH LAND DISTURBANCE – ALTERNATIVE B					
Project Feature	**Site Quantity**	**Disturbed Acreage Calculation (L x W)**	**Acres Disturbed During Construction**	**Acres Temporarily Disturbed**	**Acres Permanently Disturbed**
Construct New Lattice Steel Suspension Structure (2)	24	200 feet x 200 feet	22.0	18.6	3.5
Construct New Lattice Steel Dead-End Structure (2)	6	200 feet x 200 feet	5.5	4.4	1.1
Construct New Lattice Steel Heavy Dead-End Structure (2)	3	200 feet x 200 feet	2.8	2.2	0.6
Construct New Tubular Steel Double H-Frame (3)	12	200 feet x 200 feet	11.0	8.8	2.2
220kV Conductor and OPGW Stringing Setup Area - Puller (4)	14	200 feet x 150 feet	9.6	9.6	0.0
220kV Conductor and OPGW Stringing Setup Area - Tensioner (4)	14	500 feet x 150 feet	24.1	24.1	0.0
220kV Conductor Splicing Setup Areas (4)	0	150 feet x 100 feet	0.0	0.0	0.0
New Access Roads (5)	0.0	linear miles x 14 feet wide	0.0	0.0	0.0
New Spur Roads (5)	0.6	linear miles x 14 feet wide	1.0	0.0	1.0
Total Estimated (6)			**0**	**67.7**	**8.4**

Notes:

2. Includes foundation installation, structure assembly and erection, conductor and OPGW installation; area to be restored after construction, portion of ROW within 25 feet of the lattice steel structure to remain cleared of vegetation would be permanently disturbed for each lattice steel structure (Suspension=0.145ac; Dead-End=0.187ac; Heavy Dead-End=0.188ac).
3. Includes structure assembly and erection, conductor, and OPGW installation; area to be restored after construction, portion of ROW within 25 feet of the tubular steel double H-frame to remain cleared of vegetation, 0.185 acre would be permanently disturbed for each tubular steel double H-frame.
4. Based on 9,000-foot conductor reel lengths, number of circuits, and route design.
5. Based on length of road in miles x road width of 14 feet.
6. The disturbed acreage calculations are estimates based upon SCE's preferred area of use for the described Project feature, the width of the existing ROW, or the width of the proposed ROW, and they do not include any new access/spur road information; they are subject to revision based upon final engineering and review of the Project by SCE's Construction Manager and/or Contractor awarded Project.

Footing/Base Volume and Area Calculations:

Heavy dead-end depth 44 feet deep, 4-foot diameter, quantity 4 per structure: earth removed for footing = 20.48 cubic yards x 4 = 81.92 cubic yards; surface area = 12.57 square feet x 4 = 50.28 square feet

Dead-end depth 32 feet deep, 3.5-foot diameter, quantity 4 per structure: earth removed for footing = 11.40 cubic yards x 4 = 45.61 cubic yards; surface area = 9.62 square feet x 4 = 38.48 square feet

Suspension depth 20 feet deep, 3.25-foot diameter, quantity 4 per structure: earth removed for footing = 6.15 cubic yards x 4 = 24.60 cubic yards; surface area = 8.30 square feet x 4 = 33.20 square feet

Double H-frame depth 40 feet deep, 6-foot diameter, quantity 4 per double H-frame: earth removed for footing = 41.89 cubic yards x 4 = 167.56 cubic yards; surface area = 28.28 square feet x 4 = 113.12 square feet

TABLE 3-5 ELDORADO-IVANPAH LAND DISTURBANCE – ALTERNATIVE C					
Project Feature	**Site Quantity**	**Disturbed Acreage Calculation (L x W)**	**Acres Disturbed During Construction**	**Acres Temporarily Disturbed**	**Acres Permanently Disturbed**
Construct New Lattice Steel Suspension (2)	25	200 feet x 200 feet	23.0	19.3	3.6
Construct New Lattice Steel Dead-End Structure (2)	8	200 feet x 200 feet	7.3	5.9	1.5
Construct New Lattice Steel Heavy Dead-End Structure (2)	1	200 feet x 200 feet	0.9	0.7	0.2
Construct New Tubular Steel Double H-Frame (3)	0	200 feet x 200 feet	0.0	0.0	0.0
220kV Conductor and OPGW Stringing Setup Area - Puller (4)	4	200 feet x 150 feet	2.8	2.8	0.0
220kV Conductor and OPGW Stringing Setup Area - Tensioner (4)	4	500 feet x 150 feet	6.9	6.9	0.0
220kV Conductor Splicing Setup Areas (4)	1	150 feet x 100 feet	0.3	0.3	0.0
New Access Roads (5)	1.0	linear miles x 14 feet wide	1.6	0.0	1.6
New Spur Roads (5)	0.7	linear miles x 14 feet wide	1.1	0.0	1.1
Total Estimated (6)			**43.9**	**35.9**	**8.0**

Notes:

2. Includes foundation installation, structure assembly and erection, conductor, and OPGW installation; area to be restored after construction, portion of ROW within 25 feet of the lattice steel structure to remain cleared of vegetation would be permanently disturbed for each lattice steel structure (Suspension=0.145ac; Dead-End=0.187ac; Heavy Dead-End=0.188ac).
3. Includes structure assembly and erection, conductor, and OPGW installation; area to be restored after construction, portion of ROW within 25 feet of the tubular steel double H-frame to remain cleared of vegetation, 0.185 acre would be permanently disturbed for each tubular steel double H-frame.
4. Based on 9,000-foot conductor reel lengths, number of circuits, and route design.
5. Based on length of road in miles x road width of 14 feet.
6. The disturbed acreage calculations are estimates based upon SCE’s preferred area of use for the described Project feature, the width of the existing ROW, or the width of the proposed ROW, and they do not include any new access/spur road information; they are subject to revision based upon final engineering and review of the Project by SCE's Construction Manager and/or Contractor awarded Project.

Footing/Base Volume and Area Calculations:

Heavy dead-end depth 44 feet deep, 4-foot diameter, quantity 4 per structure: earth removed for footing = 20.48 cubic yards x 4 = 81.92 cubic yards; surface area = 12.57 square feet x 4 = 50.28 square feet

Dead-end depth 32 feet deep, 3.5-foot diameter, quantity 4 per structure: earth removed for footing = 11.40 cubic yards x 4 = 45.61 cubic yards; surface area = 9.62 square feet x 4 = 38.48 square feet

Suspension depth 20 feet deep, 3.25-foot diameter, quantity 4 per structure: earth removed for footing = 6.15 cubic yards x 4 = 24.60 cubic yards; surface area = 8.30 square feet x 4 = 33.20 square feet

Double H-frame depth 40 feet deep, 6-foot diameter, quantity 4 per double H-frame: earth removed for footing = 41.89 cubic yards x 4 = 167.56 cubic yards; surface area = 28.28 square feet x 4 = 113.12 square feet

TABLE 3-6 ELDORADO-IVANPAH LAND DISTURBANCE – ALTERNATIVE D					
Project Feature	**Site Quantity**	**Disturbed Acreage Calculation (L x W)**	**Acres Disturbed During Construction**	**Acres Temporarily Disturbed**	**Acres Permanently Disturbed**
Construct New Lattice Steel Suspension Structure (2)	18	200 feet x 200 feet	16.5	13.9	2.6
Construct New Lattice Steel Dead-End Structure (2)	3	200 feet x 200 feet	2.8	2.2	0.6
Construct New Lattice Steel Heavy Dead-End Structure (2)	0	200 feet x 200 feet	0.0	0.0	0.0
Construct New Tubular Steel Double H-Frame (3)	0	200 feet x 200 feet	0.0	0.0	0.0
220kV Conductor and OPGW Stringing Setup Area - Puller (4)	2	200 feet x 150 feet	1.4	1.4	0.0
220kV Conductor and OPGW Stringing Setup Area - Tensioner (4)	2	500 feet x 150 feet	3.4	3.4	0.0
220kV Conductor Splicing Setup Areas (4)	0	150 feet x 100 feet	0.0	0.0	0.0
New Access Roads (5)	0.0	linear miles x 14 feet wide	0.0	0.0	0.0
New Spur Roads (5)	0.4	linear miles x 14 feet wide	0.7	0.0	0.7
Total Estimated (6)			**24.8**	**20.9**	**3.9**

Notes:

2. Includes foundation installation, structure assembly and erection, conductor, and OPGW installation; area to be restored after construction, portion of ROW within 25 feet of the lattice steel structure to remain cleared of vegetation would be permanently disturbed for each lattice steel structure (Suspension=0.145ac; Dead-End=0.187ac; Heavy Dead-End=0.188ac).
3. Includes structure assembly and erection, conductor, and OPGW installation; area to be restored after construction, portion of ROW within 25 feet of the tubular steel double H-frame to remain cleared of vegetation, 0.185 acre would be permanently disturbed for each tubular steel double H-frame.
4. Based on 9,000-foot conductor reel lengths, number of circuits, and route design.
5. Based on length of road in miles x road width of 14 feet.
6. The disturbed acreage calculations are estimates based upon SCE’s preferred area of use for the described Project feature, the width of the existing ROW, or the width of the proposed ROW, and they do not include any new access/spur road information; they are subject to revision based upon final engineering and review of the Project by SCE's Construction Manager and/or Contractor awarded Project.

Footing/Base Volume and Area Calculations:

Heavy dead-end depth 44 feet deep, 4-foot diameter, quantity 4 per structure: earth removed for footing = 20.48 cubic yards x 4 = 81.92 cubic yards; surface area = 12.57 square feet x 4 = 50.28 square feet

Dead-end depth 32 feet deep, 3.5-foot diameter, quantity 4 per structure: earth removed for footing = 11.40 cubic yards x 4 = 45.61 cubic yards; surface area = 9.62 square feet x 4 = 38.48 square feet

Suspension depth 20 feet deep, 3.25-foot diameter, quantity 4 per structure: earth removed for footing = 6.15 cubic yards x 4 = 24.60 cubic yards; surface area = 8.30 square feet x 4 = 33.20 square feet

Double H-frame depth 40 feet deep, 6-foot diameter, quantity 4 per double H-frame: earth removed for footing = 41.89 cubic yards x 4 = 167.56 cubic yards; surface area = 28.28 square feet x 4 = 113.12 square feet

TABLE 3-7 ELDORADO-IVANPAH LAND DISTURBANCE – ALTERNATIVE E					
Project Feature	**Site Quantity**	**Disturbed Acreage Calculation (L x W)**	**Acres Disturbed During Construction**	**Acres Temporarily Disturbed**	**Acres Permanently Disturbed**
Construct New Lattice Steel Suspension Structure (2)	15	200 feet x 200 feet	13.8	11.6	2.2
Construct New Lattice Steel Dead-End Structure (2)	4	200 feet x 200 feet	3.7	2.9	0.7
Construct New Lattice Steel Heavy Dead-End Structure (2)	0	200 feet x 200 feet	0.0	0.0	0.0
Construct New Tubular Steel Double H-Frame (3)	0	200 feet x 200 feet	0.0	0.0	0.0
220kV Conductor and OPGW Stringing Setup Area - Puller (4)	2	200 feet x 150 feet	1.4	1.4	0.0
220kV Conductor and OPGW Stringing Setup Area - Tensioner (4)	2	500 feet x 150 feet	3.4	3.4	0.0
220kV Conductor Splicing Setup Areas (4)	0	150 feet x 100 feet	0.0	0.0	0.0
New Access Roads (5)	0.0	linear miles x 14 feet wide	0.0	0.0	0.0
New Spur Roads (5)	0.4	linear miles x 14 feet wide	0.6	0.0	0.6
Total Estimated (6)			**22.9**	**19.3**	**3.5**

Notes:

2. Includes foundation installation, structure assembly and erection, conductor, and OPGW installation; area to be restored after construction, portion of ROW within 25 feet of the lattice steel structure to remain cleared of vegetation would be permanently disturbed for each lattice steel structure (Suspension=0.145ac; Dead-End=0.187ac; Heavy Dead-End=0.188ac).
3. Includes structure assembly and erection, conductor, and OPGW installation; area to be restored after construction, portion of ROW within 25 feet of the tubular steel double H-frame to remain cleared of vegetation, 0.185 acre would be permanently disturbed for each tubular steel double H-frame.
4. Based on 9,000-foot conductor reel lengths, number of circuits, and route design.
5. Based on length of road in miles x road width of 14 feet.
6. The disturbed acreage calculations are estimates based upon SCE's preferred area of use for the described Project feature, the width of the existing ROW, or the width of the proposed ROW, and they do not include any new access/spur road information; they are subject to revision based upon final engineering and review of the Project by SCE's Construction Manager and/or Contractor awarded Project.

Footing/Base Volume and Area Calculations:

Heavy dead-end depth 44 feet deep, 4-foot diameter, quantity 4 per structure: earth removed for footing = 20.48 cubic yards x 4 = 81.92 cubic yards; surface area = 12.57 square feet x 4 = 50.28 square feet

Dead-end depth 32 feet deep, 3.5-foot diameter, quantity 4 per structure: earth removed for footing = 11.40 cubic yards x 4 = 45.61 cubic yards; surface area = 9.62 square feet x 4 = 38.48 square feet

Suspension depth 20 feet deep, 3.25-foot diameter, quantity 4 per structure: earth removed for footing = 6.15 cubic yards x 4 = 24.60 cubic yards; surface area = 8.30 square feet x 4 = 33.20 square feet

Double H-frame depth 40 feet deep, 6-foot diameter, quantity 4 per double H-frame: earth removed for footing = 41.89 cubic yards x 4 = 167.56 cubic yards; surface area = 28.28 square feet x 4 = 113.12 square feet

TABLE 3-8
CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY
TEARDOWN SINGLE-CIRCUIT 115kV TRANSMISSION LINE AND
CONSTRUCT DOUBLE-CIRCUIT 220kV TRANSMISSION LINE

Work Activity							Activity Production
Primary Equipment Description	**Estimated Horse-Power**	**Probable Fuel Type**	**Primary Equipment Quantity**	**Estimated Workforce**	**Estimated Schedule (Days)**	**Estimated Average Duration of Use (Hrs/Day)**	**Estimated Production Per Day**
Survey (1)				**4**	**36**		**35.5 miles**
1/2-ton pick-up truck, 4x4	200	Gas	2		36	8	1 mile/day
Marshalling Yard (2)				**4**			
1-ton crew cab, 4x4	300	Diesel	1		Duration of project	2	
30-ton crane truck	300	Diesel	1			2	
10,000 lb rough terrain fork lift	200	Diesel	1			5	
truck, semi, tractor	350	Diesel	1			1	
Roads and Landing Work (3)				**5**	**101**		**18.0 Miles and 258 Pads**
1-ton crew cab, 4x4	300	Diesel	2		101	2	0.5 mile/day and 4 structure pads/day
Road grader	350	Diesel	1		101	4	
Track type dozer	350	Diesel	1		101	6	
Drum type compactor	250	Diesel	1		101	4	
Water truck	350	Diesel	2		Duration	8	
Lowboy truck/trailer	500	Diesel	1		51	2	
Backhoe/front loader	350	Diesel	1		101	6	
Guard Structure Installation (4)				**6**	**4**		**16 Structures**
3/4-ton pick-up truck, 4x4	300	Diesel	2		4	6	4 structures/day
1-ton crew cab flat bed, 4x4	300	Diesel	1		4	6	
Compressor trailer	120	Diesel	1		4	6	
Auger truck	500	Diesel	1		4	6	
Pole truck/trailer	350	Diesel	1		4	6	
80-foot hydraulic man-lift/bucket truck	350	Diesel	1		4	4	
30-ton crane truck	500	Diesel	1		4	8	
Remove Existing Conductor and OHGW (5)				**14**	**71**		**35.5 Circuit Miles**
1-ton crew cab, 4x4	300	Diesel	4		71	8	0.50 mile/day
80-foot hydraulic man-lift/bucket truck	350	Diesel	3		71	8	
Sleeving truck	300	Diesel	1		71	4	

TABLE 3-8
CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY
TEARDOWN SINGLE-CIRCUIT 115kV TRANSMISSION LINE AND
CONSTRUCT DOUBLE-CIRCUIT 220kV TRANSMISSION LINE

Work Activity							Activity Production
Primary Equipment Description	**Estimated Horse-Power**	**Probable Fuel Type**	**Primary Equipment Quantity**	**Estimated Workforce**	**Estimated Schedule (Days)**	**Estimated Average Duration of Use (Hrs/Day)**	**Estimated Production Per Day**
30-ton crane truck	300	Diesel	1		71	4	
Flat bed trailer	N/A	N/A	3		64	2	
Truck, semi, tractor	350	Diesel	1		64	1	
Bull wheel puller	500	Diesel	1		48	4	
Hydraulic rewind puller	300	Diesel	1		48	4	
Remove Existing Structures (6)				**6**	**75**		**221 Structures**
1-ton crew cab, 4x4	300	Diesel	2		75	5	3 structures/day
80-ton rough terrain crane	350	Diesel	1		40	8	
30-ton crane truck	300	Diesel	2		75	6	
Compressor trailer	120	Diesel	2		40	8	
Flat bed truck/trailer	350	Diesel	1		35	8	
10,000-lb rough terrain forklift	200	Diesel	1		35	4	
Remove Existing Foundations (7)				**8**	**67**		**208 LSH-Frames 13 LSTs**
1-ton crew cab flat bed, 4x4	300	Diesel	2		67	8	8 grillage foundations/day or 4 concrete foundations/day
10-cubic yard dump truck	350	Diesel	2		67	8	
Backhoe/front loader	350	Diesel	2		67	8	
Compressor trailer	120	Diesel	2		67	8	
Remove Existing Wood Poles (8)				**6**	**7**		**23 H-Frames 6 Poles**
3/4-ton pick-up truck, 4x4	300	Diesel	2		7	5	8 poles/day
1-ton crew cab flat bed, 4x4	300	Diesel	1		7	5	
30-ton crane truck	300	Diesel	1		7	6	
Pole truck/trailer	350	Diesel	2		7	8	
Install LST Foundations (9)				**18**	**144**		**216 LSTs**
1-ton crew cab flat bed, 4x4	300	Diesel	4		144	2	1.5 LSTs/day
30-ton crane truck	300	Diesel	2		144	5	
Backhoe/front loader	200	Diesel	2		144	8	
Auger truck	500	Diesel	2		144	8	

TABLE 3-8 CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY TEARDOWN SINGLE-CIRCUIT 115kV TRANSMISSION LINE AND CONSTRUCT DOUBLE-CIRCUIT 220kV TRANSMISSION LINE							
Work Activity							**Activity Production**
Primary Equipment Description	**Estimated Horse-Power**	**Probable Fuel Type**	**Primary Equipment Quantity**	**Estimated Workforce**	**Estimated Schedule (Days)**	**Estimated Average Duration of Use (Hrs/Day)**	**Estimated Production Per Day**
10-cubic yard dump truck	350	Diesel	4		144	8	
4,000-gallon water truck	350	Diesel	2		144	8	
10-cubic yard concrete mixer truck	425	Diesel	6		144	5	
LST Steel Haul (10)				**8**	**108**		**216 LSTs**
1-ton crew cab flat bed, 4x4	300	Diesel	4		108	2	2 LSTs/day
Flat bed truck/trailer	350	Diesel	2		108	8	
10,000 lb Rough Terrain Fork Lift	200	Diesel	2		108	6	
LST Steel Assembly (11)				**42**	**144**		**216 LSTs**
3/4-ton pick-up truck, 4x4	300	Diesel	6		144	4	1.5 LSTs/day
1-ton crew cab flat bed, 4x4	300	Diesel	9		144	4	
30-ton crane truck	300	Diesel	6		144	8	
Compressor trailer	120	Diesel	6		144	6	
LST Erection (12)				**16**	**108**		**216 LSTs**
3/4-ton pick-up truck, 4x4	300	Diesel	4		108	5	2 LSTs/day
1-ton crew cab flat bed, 4x4	300	Diesel	4		108	5	
Compressor trailer	120	Diesel	2		108	6	
80-ton rough terrain crane	350	Diesel	2		108	6	
Install Tubular Steel H-Frame Foundations (13)				**7**	**42**		**42 H-Frames**
1-ton crew cab flat bed, 4x4	300	Diesel	3		42	2	1 H-frame/day
30-ton crane truck	300	Diesel	1		42	5	
Backhoe/front loader	200	Diesel	1		42	8	
Auger truck	500	Diesel	1		42	8	
10-cubic yard dump truck	350	Diesel	2		42	8	
4,000-gallon water truck	350	Diesel	1		42	8	

TABLE 3-8 CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY TEARDOWN SINGLE-CIRCUIT 115kV TRANSMISSION LINE AND CONSTRUCT DOUBLE-CIRCUIT 220kV TRANSMISSION LINE							
Work Activity						**Estimated Average Duration of Use (Hrs/Day)**	**Activity Production**
Primary Equipment Description	**Estimated Horse-Power**	**Probable Fuel Type**	**Primary Equipment Quantity**	**Estimated Workforce**	**Estimated Schedule (Days)**		**Estimated Production Per Day**
10-cubic yard concrete mixer truck	425	Diesel	3		42	3	
Tubular Steel H-Frame Haul (14)				**4**	**21**		**42 H-Frames**
3/4-ton pick-up truck, 4x4	300	Diesel	2		21	5	2 H-frames/day
Flat bed truck/trailer	350	Diesel	2		21	8	
80-ton rough terrain crane	350	Diesel	1		21	6	
Tubular Steel H-Frame Assembly (15)				**8**	**42**		**42 H-Frames**
3/4-ton pick-up truck, 4x4	300	Diesel	2		42	5	1 H-frame/day
1-ton crew cab flat bed, 4x4	300	Diesel	2		42	5	
Compressor trailer	120	Diesel	1		42	5	
80-ton rough terrain crane	350	Diesel	1		42	6	
Tubular Steel H-Frame Erection (16)				**8**	**42**		**42 H-Frames**
3/4-ton pick-up truck, 4x4	300	Diesel	2		42	5	1 H-frame/day
1-ton crew cab flat bed, 4x4	300	Diesel	2		42	5	
Compressor trailer	120	Diesel	1		42	5	
80-ton rough terrain crane	350	Diesel	1		42	6	
Install Conductor and OPGW (17)				**32**	**205**		**71.0 Circuit Miles**
1-ton crew cab flat bed, 4x4	300	Diesel	5		205	8	0.35 mile/day
Wire truck/trailer	350	Diesel	6		205	2	
Dump truck (trash)	350	Diesel	1		205	2	
3/4-ton pick-up truck, 4x4	300	Diesel	6		205	8	
22-ton Manitex	350	Diesel	1		205	8	
30-ton Manitex	350	Diesel	4		205	6	
Splicing rig	350	Diesel	2		205	2	
Splicing lab	300	Diesel	2		48	2	
20,000-lb rough terrain fork lift	350	Diesel	1		205	2	

TABLE 3-8 CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY TEARDOWN SINGLE-CIRCUIT 115kV TRANSMISSION LINE AND CONSTRUCT DOUBLE-CIRCUIT 220kV TRANSMISSION LINE							
Work Activity						**Estimated Average Duration of Use (Hrs/Day)**	**Activity Production**
Primary Equipment Description	**Estimated Horse-Power**	**Probable Fuel Type**	**Primary Equipment Quantity**	**Estimated Workforce**	**Estimated Schedule (Days)**		**Estimated Production Per Day**
580 Case Backhoe	120	Diesel	1		205	2	
Spacing cart	10	Diesel	3		51	8	
Static truck/ tensioner	350	Diesel	1		205	2	
3 drum straw line puller	300	Diesel	2		205	4	
30-ton puller	525	Diesel	1		205	3	
Sag Cat w2 winch	350	Diesel	2		205	2	
D8 Cat	300	Diesel	4		205	1	
Hughes 500 E Helicopter		Jet A	1		52	6	
Fuel, helicopter support truck	300	Diesel	1		52	2	
Lowboy truck/trailer	500	Diesel	1		205	2	
Guard Structure Removal (18)				**6**	**4**		**16 Structures**
3/4-ton pick-up truck, 4x4	300	Diesel	2		4	6	4 structures/day
1-ton crew cab flat bed, 4x4	300	Diesel	2		4	6	
Compressor trailer	120	Diesel	2		4	6	
Pole truck/trailer	350	Diesel	2		4	6	
80-foot hydraulic man-lift/bucket truck	350	Diesel	1		4	4	
30-ton crane truck	500	Diesel	1		4	8	
Restoration (19)				**7**	**36**		**35.5 Miles**
1-ton crew cab, 4x4	300	Diesel	2		36	2	1 mile/day
Road grader	350	Diesel	1		36	6	
Backhoe	350	Diesel	1		36	6	
Front end loader	350	Diesel	1		36	6	
Track type dozer	350	Diesel	1		36	6	
Drum type compactor	250	Diesel	1		36	6	
Water truck	350	Diesel	1		36	8	
Lowboy truck/trailer	500	Diesel	1		36	3	

TABLE 3-8 CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY TEARDOWN SINGLE-CIRCUIT 115kV TRANSMISSION LINE AND CONSTRUCT DOUBLE-CIRCUIT 220kV TRANSMISSION LINE							
Work Activity						Estimated Average	Activity Production
Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Estimated Schedule (Days)	Duration of Use (Hrs/Day)	Estimated Production Per Day
Crew Size Assumptions: #1 Survey = one 4-man crew #2 Marshalling Yards = one 4-man crew #3 Roads and Landing Work = one 5-man crew #4 Guard Structure Installation = one 6-man crew #5 Remove Existing Conductor and OHGW = one 14-man crew #6 Remove Existing LSTs and Lattice Steel H (LSH Frames = one 6-man crew #7 Remove Existing Foundations = two 4-man crews #8 Remove Existing Wood Poles = one 6-man crew #9 Install Foundations for LSTs = two 9-man crews #10 LST Steel Haul = two 4-man crews #11 LST Steel Assembly = six 7-man crews #12 LST Erection = two 8-man crews #13 Install Foundations for Tubular Steel H-Frames = one 7-man crew #14 Tubular Steel H-Frame Haul = one 4-man crew #15 Tubular Steel H-Frame Assembly = one 8-man crew #16 Tubular Steel H-Frame Erection = one 8-man crew #17 Conductor and OPGW Installation = four 8-man crews #18 Guard Structure Removal = one 6-man crew #19 Restoration = one 7-man crew							

3.7.1.3 Siting

For siting, a detailed survey would be conducted, additional ROW acquired, and detailed engineering designs started. A control centerline would be established, based on field survey measurements. Control monuments, consisting of 2-inch-diameter iron pipes sealed with a stamped brass cap would be set at maximum intervals of approximately 2.0 miles. Visual reference points parallel and perpendicular to the control line would be established so that photogrammetric profiles of the area's topography could be compiled. Approximate structure locations would be spotted on the profiles according to the engineering design criteria. Once approximate structure locations have been selected, exact positions would be field surveyed. During this phase of the work, site adjustments are made to avoid an environmental sensitivity or to maintain structure integrity and sustainability. Structure location approval and clearance procedures are discussed in the following section.

Survey crews would also locate spur road centerlines, grades, and soil boring locations. Final determinations of road location curvature, cuts and fills, grades and drainage, and necessary erosion controls would be made in accordance with design standards and practices and/or landowner requirements.

3.7.1.4 Structure Location Approval and Clearance Procedure

SCE is committed to construction and operation of its facilities in an uncompromisingly safe manner. This shall be the priority in siting and constructing all facilities.

An SCE team made up of SCE personnel and their contractors, including representatives from engineering, environmental, construction management, maintenance, and corporate real estate, would visit each proposed structure site following the completion of preliminary engineering and prior to the commencement of detailed, final engineering of the structures. Each structure site and associated spur road would be reviewed by the team to assess the suitability of the site, and a buffer area along each spur road and around each structure site would be inspected. If the structure can be constructed safely and no environmental sensitivities are identified and there are no other issues affecting construction, maintenance, or real estate, the site would be marked as approved and the team would move to the next structure site and spur road. Engineering would proceed on that structure at the approved location.

If an environmental sensitivity is identified, the team would first determine if the sensitivity could be mitigated. If the sensitivity could not be mitigated, the team would then consider moving the structure in-line to avoid the sensitivity, if and only if the structure could be moved without compromising worker safety (in general, structures would not be moved side to side, but only in-line). In most cases, the team would be able to move a structure site away from sensitivities to a new site. Typically, this could be accomplished with a move of 50 feet or less. The recommended new structure site would then be inspected by the team. If no new safety, environmental, construction, maintenance, or real estate issues are identified, preliminary engineering for this new site would be checked and the new structure site and associated spur road route would be approved by the team. Once proposed structure sites are approved, detailed engineering would proceed. During detailed engineering, no further structure site adjustments would occur without consultation with the interdisciplinary team.

The foundations for the 220kV structures could require up to four drilled, poured-in-place concrete footings. Lattice steel structures require four concrete footings, and steel H-frame structures require two concrete footings. The size of the excavation would depend on the type of structure and soil conditions at each structure site. With excavations for structure foundations, structure sites may, on rare occasion, need to be moved due to excavation difficulties or discovery of some new sensitivity. During this phase of the work, site adjustments are made only if necessary to avoid an environmental sensitivity or to maintain structure integrity and sustainability.

3.7.1.5 Construction Yards

Construction of the Project transmission line would begin with the establishment of approximately seven temporary construction yards located at strategic points along the route. Two of these construction yards would be in California, while five would be in Nevada. Table 3-9 lists the proposed location and current condition of each yard. SCE or its contractors may utilize additional construction yards as needed to optimize construction efficiency.

TABLE 3-9 ELDORADO-IVANPAH CONSTRUCTION YARD LOCATIONS			
Name	**Location**	**Condition**	**Approximate Area (acres)**
No. 1	Eldorado Sub, Nevada	Previously Disturbed	9.8
No. 2	Jean, Nevada	Previously Disturbed	13.6
No. 3	Generating Station Yard, Nevada	Previously Disturbed	16.5
No. 4	Primm Valley Casino Vacant Lot, Nevada	Previously Disturbed	28.3
No. 5	Whiskey Pete's Casino Vacant Lot, Nevada	Previously Disturbed	2.4
No. 6	BrightSource Generating Station Yard, California	Unknown at this time	10+
No. 7	Nipton, California	Previously Disturbed	2.5

Each yard would be used as a reporting location for workers, and for vehicle and equipment parking and material storage. The yards would have offices for supervisory and clerical personnel. Normal maintenance of construction equipment would be conducted at these yards. The maximum number of workers reporting to any one yard is not expected to exceed approximately 100 workers at any one time. Each yard would be 2 to 28 acres in size, depending on land availability and intended use. Construction of the Ivanpah Substation would not require a temporary laydown area outside the substation fenced area.

At peak construction, most of the vehicles could occupy the yards listed. Approximately 80 private commuting vehicles would also be parked at the yard. Crews would load materials onto work trucks and drive to the line position being worked. At the end of the day, they would return to the yard in their work vehicles and depart in their private vehicles.

Materials stored at the construction yards would include:

- Conductors
- Wood Poles
- OPGW cable
- Hardware
- Construction equipment
- Steel
- Insulators
- Signage
- Consumables, such as fuel and joint compound
- Storm Water Pollution Prevention Plan (SWPPP) materials, such as straw wattles, gravel, and silt fences
- Waste materials for recycling or disposal.

3.7.1.6 Guard Structures

Guard structures may be installed at transportation, flood control, and utility crossings. Guard structures are temporary facilities designed to stop the movement of a conductor should it momentarily drop below a conventional stringing height. Temporary netting could be installed to protect some types of under-built infrastructure. Typical guard structures are standard wood poles, 60 to 80 feet tall, and depending on the width of the conductor being constructed, the number of guard poles installed on either side of a crossing would be between two and four. The guard structures are removed after the conductor is clipped into place. In some cases, the wood poles could be substituted with the use of specifically equipped boom-type trucks with heavy outriggers staged to prevent the conductor from dropping.

Public agencies differ on their policies for preferred methods to public safety during conductor stringing operations. For highway and open channel aqueduct crossings, SCE would work closely with the applicable jurisdiction to secure the necessary permits to string conductor across the applicable infrastructure. For major roadway crossings, typically one of the following four methods is employed to protect the public:

- Erection of a highway net guard structure system
- Detour of all traffic off a highway at the crossing position
- Implementation of a controlled continuous traffic break while stringing operations are performed
- Strategic placement of special line trucks with extension booms on the highway deck

Based on a review of the number of road crossings that would be needed along the currently proposed route, SCE has estimated that approximately 16 guard structures (Table 3-10) would be installed to facilitate construction. Please note that these estimates are preliminary as the types of guard structures that would be required for crossings and the number of crossings necessary would be field verified upon completion of final design.

TABLE 3-10
ELDORADO-IVANPAH GUARD STRUCTURE LOCATIONS

GS #	Location of Guard Structure	Type of Guard Structure
1	West side distribution line between Milepost 32/33	H-frame
2	East side distribution line between Milepost 32/33	H-frame
3	South side of Dirt Road near Milepost 33	Bucket Truck
4	North side of Dirt Road, near Milepost 33, crossing over distribution line	Bucket Truck
5	South bound I-15 west side of highway, near Milepost 29, south of state line	H-frame w/net
6	South bound I-15 in center median, near Milepost 29, south of state line	H-frame w/net
7	North bound I-15 in center median, near Milepost 29, south of state line	H-frame w/net
8	North bound I-15 east side of highway, near Milepost 29, south of state line	H-frame w/net
9	Southwest side of Lotto Store Road, between Milepost 28/29, at southern edge of outlet mall	H-frame
10	Northeast side of Lotto Store Road, between Milepost 28/29, at southern edge of outlet mall	H-frame
11	Southwest side of Fashion Outlet Way, between Milepost 28/29, at eastern edge of outlet mall	H-frame
12	Northeast side of Fashion Outlet Way, between Milepost 28/29, at eastern edge of outlet mall	H-frame
13	South side of E. Primm Boulevard between Milepost 28/29	H-frame
14	North side of E. Primm Boulevard between Milepost 28/29	H-frame
15	West side of Union Pacific Railroad (UPRR) between Milepost 26/27	H-frame
16	East side of UPRR between Milepost 26/27	H-frame

3.7.1.7 Dismantle and Removal of Existing 115kV Transmission Facilities

The construction of a portion of the Proposed Project would require the removal of the existing 115kV transmission line. Transmission line equipment to be removed includes 208 existing 115kV LST H-frames, 13 existing 115kV LSTs, 23 wood pole H-frames, 6 wood poles and associated hardware (i.e., cross arms, insulators, vibration dampeners, suspension clamps, ground wire clamps, shackles, links, nuts, bolts, washers, cotters pins, insulator weights, and bond wires), as well as the transmission line conductor.

SCE proposes to remove the existing 115kV structures through the following activities:

- Set Up: Existing access routes would be used to reach structure sites, but some rehabilitation work on these routes may be necessary before removal activities begin. In addition, grading may be necessary to establish temporary crane pads for structure removal.

- Structure Removal: For each type of structure, a crane truck or rough terrain crane will be used to support structure during removal; a crane pad of approximately 50 feet by 50 feet may be required to allow a removal crane to be set up at a distance of 60 feet from the structure center line. The crane rail would be located transversely from the structure locations.

- Footing Removal: The existing LST and H-frame footings would be removed to a depth of approximately 1-2 feet. Holes would be filled, compacted, and then the area would be smoothed to match surrounding grade.

SCE proposes to remove the existing 115kV conductor through the following activities:

- Wire Pulling Locations: Wire-pulling locations would be sited no more than every 15,000 feet along the utility corridor, and would include locations at dead-end structures and turning points. It is anticipated that many of the same locations would be used for installation of the new 220kV lines that would be used for the removal of existing 115kV lines. Wire-pulling equipment would be placed at these locations.

- Pulling Cable: A 3/8-inch pulling cable would replace the old conductor as it is being removed; this allows complete control of the conductor during its removal. The 3/8-inch line would then be removed under controlled conditions to minimize ground disturbance, and all wire-pulling equipment would be removed.

- Breakaway Reels: The old conductor wire would be wound onto “breakaway” reels as it is removed. The old conductor would be transported to a marshalling yard where it would be prepared for recycling.

3.7.1.8 Access Roads and Spur Roads

Except for Alternative Route C, no new main access roads are expected to be required. Where overland vehicle travel is not possible, upgrades to main access roads and extensions to existing spur roads would be needed to allow passage of construction vehicles. Such upgrades may require vegetation clearing and grading based on site conditions. There are approximately 35 miles of existing main access roads. Approximately 1.2 miles of new spur roads would be needed for the proposed route, disturbing approximately 2.1 acres. The spur roads would be a minimum of 14 feet wide. It is anticipated that most of the spur roads constructed to accommodate new construction would be left in place to facilitate future access for operations and maintenance purposes.

3.7.1.9 Site Preparation

The new structure pad locations would first be graded and/or cleared to provide a reasonably level and vegetation-free surface for footing construction. Sites would be graded such that water would run toward the direction of the natural drainage. In addition, drainage would be designed to prevent ponding and erosive water flows that could cause damage to the structure footings. The graded area would be compacted and would be capable of supporting heavy vehicular traffic.

Assembly of LSTs and steel H-frame structures typically will require a laydown area of approximately 200 feet by 200 feet. In locations where the terrain in the laydown area is already reasonably level (for example, at an existing structure location), only vegetation removal would occur to prepare the site for construction. In locations where a level surface is not present (for example, a new structure site), both vegetation clearing and grading would be necessary to prepare the laydown area for construction.

Erection of the LSTs and steel H-frame structures may also require establishment of a crane pad to allow an erection crane to set up 60 feet from the centerline of each structure. The crane pad would be located transversely from each applicable structure location. The crane pad would be located within the laydown area used for structure assembly. The pad would be cleared of vegetation and also graded as necessary to provide a level surface for crane operation.

In mountainous areas, benching may be required to provide access for footing construction, assembly, erection, and wire-stringing activities during line construction. It would be used minimally to help ensure the safety of personnel during construction activities.

3.7.1.10 Foundation Installation

The Eldorado-Ivanpah 220kV transmission line would require the construction of approximately 216 new LSTs and approximately 42 steel H-frame structures. Each structure would require multiple drilled, poured-in-place, concrete footings that form the structure foundation. The maximum depth below ground level for the various types of structures is expected to be approximately 45 feet. Actual footing depths for the structure foundation would depend on the soil conditions and topography at each site and would be determined during final engineering.

Foundations in soft or loose soil and that extend below the groundwater level may be stabilized with casings or drilling mud slurry. Mud slurry will be placed in the hole after drilling to prevent the sidewalls from sloughing. The concrete for the foundation is then pumped to the bottom of the hole, displacing the mud slurry. The mud slurry brought to the surface is typically collected in a pit adjacent to the foundation, and then pumped out of the pit to be reused or discarded.

Structure foundations for each LST will consist of four concrete footings, and structure foundations for each steel H-frame structure will consist of two concrete footings. The foundation process would start with the drilling of the holes for each type of structure. The holes would be drilled using truck or track-mounted excavators with various diameter augers to match the diameter requirements of the structure type. LSTs typically require an excavated hole of 3 to 4 feet in diameter and 20 to 45 feet deep. Steel H-frame structures typically require an excavated hole of up to 6 feet in diameter and up to 40 feet deep. On average, each footing for an LST and steel H-frame structure would project approximately 1 to 4 feet above ground level.

Following excavation of the foundation footings, steel reinforced cages and stub angles would be set, survey positioning would be verified, and concrete would then be placed. Steel reinforced cages and stub angles would be assembled at laydown yards and delivered to each structure location by flatbed truck. Typically, LSTs would require 25 to 100 cubic yards of concrete delivered to each structure location, depending upon the type of structure being constructed. Typically steel H-frame structures would require 80 to 120 cubic yards of concrete delivered to each structure location.

Concrete samples would be drawn at time of pour and tested to ensure engineered strengths were achieved. A normally specified SCE concrete mix typically takes approximately 20 working days to cure to an engineered strength. This strength is verified by controlled testing of sampled concrete. Once this strength has been achieved, crews would be permitted to commence erection of steel.

During construction, existing concrete supply facilities would be used where feasible. If concrete supply facilities do not exist in certain areas, a temporary concrete batch plant would be set up. If necessary, approximately 2 acres of property would be sub-partitioned from a marshalling area for a temporary concrete batch plant. Equipment would include a central mixer unit (drum type); three silos for injecting concrete additives, fly ash, and cement; a water tank; portable pumps; a pneumatic injector; and a loader for handling concrete additives not in the silos. Dust emissions would be controlled by watering the area and by sealing the silos and transferring the fine particulates pneumatically between the silos and the mixers.

Conventional construction techniques would generally be used as described above for new footing installation. In certain cases, equipment and material may be deposited at structure sites using helicopters or by workers on foot, and crews may prepare the footings using hand labor assisted by hydraulic or pneumatic equipment, or other methods.

Prior to drilling for foundations in California, SCE would contact Underground Service Alert to identify any underground utilities in the construction zone. In Nevada, a similar organization would be contacted for the same purpose.

3.7.1.11 Structure Assembly and Erection

At the structure fabrication plant, structural members would be bundled and shipped by rail or truck to the construction yards, and then trucked to the individual sites.

LSTs would be assembled at laydown areas at each site, and then erected and bolted to the foundations. Structure assembly would begin with hauling and stacking the bundles of steel at structure location per engineering drawing requirements. This activity requires use of several tractors with 40-foot trailers and a rough terrain forklift. After steel is delivered and stacked, crews would proceed with assembly of leg extensions, body panels, boxed sections, and the bridges. The steel work would be completed by a combined erection and torquing crew with a lattice boom crane. The construction crew may opt to install insulators and wire rollers (travelers) at this time. Ground disturbance would generally be limited to the laydown areas, which would typically occupy an area of 200 feet by 200 feet.

For steel H-frame structures, steel work would consist of hauling the poles in sections to their designated sites using semi-trucks with 40-foot trailers and rough terrain cranes. At the site, the poles would be set on the foundations (and only once the proper cure time for the concrete foundation had been attained). The poles could either be assembled into a complete structure or set one piece at a time by stacking and jacking them together. This would depend largely on the terrain and available equipment. Laydown areas would be established for the assembly process and would generally occupy an area of 200 feet by 200 feet at each steel H-frame structure location.

Where road access is available to structure sites, assembled sections would be lifted into place with a minimum 80-ton crane. The crane pad would be would be located transversely and set up approximately 60 feet from the centerline of each structure. The crane would move along the ROW for structure erection purposes.

Where there would be a structure located in terrain inaccessible by a crane, it is anticipated that a helicopter may be used for the installation of the structure. Helicopter use is expected only in the McCullough Pass area and for line stringing. The final decision on helicopter use will be made by SCE and the construction contractor. The use of helicopters for the erection of structures would be in accordance with SCE specifications and would be similar to methods detailed in Institute of Electrical and Electronic Engineers (IEEE) 951-1996, Guide to the Assembly and Erection of Metal Transmission Structures, Section 9, Helicopter Methods of Construction.

The operations area of the helicopters would be limited to helicopter staging areas near construction locations that are considered safe locations for landing. Final siting of staging areas would be conducted with the input of the helicopter contractor, and affected private landowners and land management agencies. The size of each staging area would be dependent upon the size and number of structures to be installed. Staging areas would likely change as work progresses.

3.7.1.12 Grounding

Transmission structures located within the substation boundary will be grounded to the substation ground grid. Foundation for a 220kV structure located more than 700 feet from a substation shall meet the following foundation to ground resistance criteria with dry soil conditions: 30 ohms or less.

If the above foundation to ground resistance criteria cannot be met with ground rods, a counterpoise system shall be installed per the following: (1) two counterpoise to be installed diagonally opposite if the foundation to ground resistance is less than 100 ohms; (2) four counterpoise to be installed (one on each leg of a four-leg structure) if the foundation to ground resistance is greater than 100 ohms.

3.7.1.13 Stringing Activities

Prior to stringing activities, bucket trucks, wood pole guard structures, or temporary protective netting systems that were erected at the crossings for roads, streets, railroads, highways, or other transmission, distribution, or communication facilities for 115kV conductor removal would be inspected or reinstalled. The stringing of conductor and OHGW on new transmission lines typically commences once a number of structures have been erected and inspected.

Wire-stringing includes all activities associated with the installation of conductors. This activity includes the installation of primary conductor and OPGW or ground wire, vibration dampeners, weights, spacers, and suspension and dead-end hardware assemblies. Insulators and stringing sheaves (rollers or travelers) are attached as part of the wire-stringing activity if the work is a part of a reconductoring effort; otherwise they are typically attached during the steel erection process. Wire-stringing activities would be conducted in accordance with SCE specifications, which is similar to process methods detailed in IEEE Standard 524-2003, Guide to the Installation of Overhead Transmission Line Conductors. A standard wire-stringing plan includes a sequenced program of events starting with determination of wire pulls and wire pull equipment set-up positions. Advanced planning by supervision determines circuit outages, pulling times, and safety protocols needed for ensuring that safe and quick installation of wire is accomplished.

Typically, wire pulls occur every 15,000 to 18,000 feet on flat terrain or less in rugged terrain. Wire splices typically occur every 7,500 to 9,000 feet on flat terrain or less in rugged terrain. Wire pulls are the length of any given continuous wire installation process between two selected points along the line. Wire pulls are selected, where possible, based on availability of dead-end structures at the ends of each pull, geometry of the line as affected by points of inflection, terrain, and suitability of stringing and splicing equipment setups. In some cases, it may be preferable to select an equipment setup position between two suspension structures. Anchor rods would then be installed to provide dead-ending capability for wire sagging purposes, and also to provide a convenient splicing area.

To ensure the safety of workers and the public, safety devices such as traveling grounds, guard structures, and radio-equipped public safety roving vehicles and linemen would be in place prior to the initiation of wire-stringing activities.

The following four steps describe the wire installation activities proposed by SCE:

- Step 1: Sock Line, Threading: A helicopter would fly a lightweight sock line from structure to structure, which would be threaded through the wire rollers in order to engage a cam-lock device that would secure the pulling sock in the roller. This threading process would continue between all structures through the rollers of a particular set of spans selected for a conductor pull.

- Step 2: Pulling: The sock line would be used to pull in the conductor pulling cable. The conductor pulling cable would be attached to the conductor using a special swivel joint to prevent damage to the wire and to allow the wire to rotate freely to prevent complications from twisting as the conductor unwinds off the reel. A piece of hardware known as a running board would be installed to properly feed the conductor into the roller; this device keeps the bundle conductor from wrapping during installation.

- Step 3: Splicing, Sagging, and Dead-ending: After the conductor is pulled in, all mid-span splicing would be performed. Once the splicing has been completed, the conductor would be sagged to proper tension and dead-ended to structures.

- Step 4: Clipping-in, Spacers: After the conductor is dead-ended, the conductors would be attached to all tangent structures; a process called clipping in. Once this is complete, spacers would be attached between the bundled conductors of each phase to keep uniform separation between each conductor.

As noted above, the threading step of wire installation would require the use of one helicopter. On average, the helicopter would operate approximately 6 hours per day during stringing operations. The operations area of the helicopter would be limited to helicopter staging areas and are considered safe locations for landing. Final siting of staging areas for the Proposed Project would be conducted with the input of the helicopter contractor, and affected private landowners and land management agencies. The size of each staging area would be dependent upon the size and number of structures to be removed and installed. Staging areas would likely change as the work progresses along the transmission lines.

Helicopter fueling would occur at staging areas or at a local airport using the helicopter contractor's fuel truck, and would be supervised by the helicopter fuel service provider. The helicopter and fuel truck would stay overnight at a local airport or at a staging area if adequate security is in place.

The dimensions of the area needed for the stringing setups associated with wire installation are variable and depends upon terrain. The preferred minimum size needed for tensioning equipment set-up sites requires an area of 150 feet by 500 feet, the preferred minimum size needed for pulling equipment set-up sites requires an area of 150 feet by 200 feet, the preferred minimum size needed for splicing equipment set-up sites requires an area of 150 feet by 100 feet; however, crews can work from within slightly smaller areas when space is limited. Each stringing operation would include one puller positioned at one end and one tensioner and wire reel stand truck positioned at the other end. Splicing sites would be strategically located to support the stringing operations; splicing sites include specialized support equipment such as skidders and wire crimping equipment.

The puller, tensioner, and splicing set-up locations are used to remove temporary pulling splices and install permanent splices once the conductor is strung through the rollers located on each structure, and are necessary as the permanent splices that join the conductor together cannot travel through the rollers. For stringing equipment that cannot be positioned at either side of a dead-end transmission structure, field snubs (i.e., anchoring and dead-end hardware) would be temporarily installed to sag conductor wire to the correct tension.

The puller, tensioner, and splicing set-up locations require level areas to allow for maneuvering of the equipment. When possible, these locations would be located on existing level areas and existing roads to minimize the need for grading and cleanup.

The puller, tensioner, and splicing set-up locations associated with the Proposed Project would be temporary and the land would be restored to its previous condition following completion of pulling and splicing activities. Estimates of the land disturbance associated with this activity for the proposed and alternate routes are provided in Tables 3.2 to 3.7. The final number and locations of the puller, tensioner, and splicing sites will be determined during final engineering for the Proposed Project and the construction methods chosen by SCE or its Contractor.

An overhead OPGW would be installed on the transmission line for shielding and communication purposes. The OPGW would be installed in the same manner as the conductor; it is typically installed in continuous segments of 19,000 feet or less if installed in conjunction with the conductor, depending upon various factors, including line direction, inclination, and accessibility. Following installation of the OPGW, the strands in each segment are spliced together to form a continuous length from one end of a transmission line to the other. At a splice location, the fiber cables are routed down a structure leg where the splicing occurs. The splices are housed in a splice box (typically a 3-foot x 3-foot x 1-foot metal enclosure) that is mounted to one of the structure legs some distance above the ground. On the last structure at each end of a transmission line, the overhead fiber is spliced to another section of fiber cable that runs in underground conduit from the splice box into the communication room inside the adjacent substation.

3.7.1.14 Housekeeping and Site Cleanup

During construction, water trucks may be used to minimize the quantity of airborne dust created by construction activities. Any damage to existing roads as a result of construction would be repaired once construction is complete.

SCE would restore all areas that are temporarily disturbed by project activities (including material staging yards, pull and tension sites, and splicing sites) to preconstruction conditions following the completion of construction. Restoration would include grading and restoration of sites to original contours and reseeding where appropriate. In addition, all construction materials and debris would be removed from the area and recycled or properly disposed of off-site. SCE would conduct a final survey to ensure that cleanup activities are successfully completed.

3.8 115KV SUBTRANSMISSION LINE CONSTRUCTION

Seven existing LST H-frame structures (121-0 through 121-6) will be removed and replaced with one single-circuit engineered TSP (Figure 3.3-1) and six light weight steel pole (LWSP) H-frames (Figure 3.3-2) within the existing right of way at the transition point going north into the Ivanpah Substation. In addition, six LWSP H-frames will be installed at mid-span of the replaced structures to meet current requirements.

Approximately three single-circuit engineered TSPs will be installed and looped in to the proposed Ivanpah 115kV rack position. The engineered TSPs will require concrete footings. The LWSP H-frames will be direct buried and backfilled with native soils. One circuit of 653.9 ACSR conductors, one conductor per phase, three phases per circuit, and two 3/8-inch-high strength shield wires will be placed on the new poles.

Permanent and temporary land disturbance estimated for construction of the 115kV system is presented in Table 3-11. The estimated number of persons and types of equipment required for construction of the 115kV system is shown in Table 3-12.

TABLE 3-11
ELDORADO-IVANPAH PROJECT LAND DISTURBANCE 115KV SUBTRANSMISSION SYSTEM

Project Feature	Site Quantity	Disturbed Acreage Calculation (L x W)	Acres Disturbed During Construction	Acres Temporarily Disturbed	Acres Permanently Disturbed
Remove Existing Lattice Steel H-Frame and Construct New TSP (1 and 2)	1	200 feet x 100 feet	0.5	0.4	0.1
Remove Existing Lattice Steel H-Frame and Construct New LWS H-Frame (1 and 3)	6	200 feet x 100 feet	2.8	2.4	0.4
Construct New Tubular Steel Pole (2)	3	200 feet x 100 feet	1.4	1.2	0.2
Construct New LWS H-Frame (1 and 3)	6	200 feet x 100 feet	2.8	2.4	0.4
Total Estimated (4)			**7.3**	**6.3**	**1.0**

Notes:

1. Includes the removal of existing conductor, teardown of existing structure, and removal of foundation 2 feet below ground surface.
2. Includes structure assembly and erection, conductor, and shield wire installation; area to be restored after construction, portion of ROW within 25 feet of the tubular steel pole to remain cleared of vegetation, approximately 0.057 acre would be permanently disturbed for each tubular steel pole.
3. Includes structure assembly and erection, conductor, and shield wire installation; area to be restored after construction, portion of ROW within 25 feet of the LWS H-frame to remain cleared of vegetation, approximately 0.067 acre would be permanently disturbed for each LWS H-frame.
4. The disturbed acreage calculations are estimates based upon SCE's preferred area of use for the described Project feature, the width of the existing ROW, or the width of the proposed ROW, and they do not include any new access/spur road information; they are subject to revision based upon final engineering and review of the Project by SCE's Construction Manager and/or contractor awarded Project.

Footing/Base Volume and Area Calculations:

TSP depth 40 feet deep, 6-foot diameter, quantity 1 per TSP: earth removed for footing = 41.89 cubic yards; surface area = 28.28 square feet

LWS H-frame depth 9 feet deep, 4-foot diameter, quantity 1 per LWS H-Frame: earth removed for pole base = 4.19 cubic yards; surface area = 12.57 square feet

TABLE 3-12 CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY CONSTRUCT SINGLE-CIRCUIT 115kV TRANSMISSION LINE							
Work Activity						**Activity Production**	
Primary Equipment Description	**Estimated Horse-Power**	**Probable Fuel Type**	**Primary Equipment Quantity**	**Estimated Workforce**	**Estimated Schedule (Days)**	**Estimated Average Duration of Use (Hrs/Day)**	**Estimated Production Per Day**
Survey (1)				**4**	**1**		**1.0 Mile**
1/2-ton pick-up truck, 4x4	200	Gas	2		1	8	1 mile/day
Roads and Landing Work (2)				**5**	**5**		**0. 5 Miles / 16 Pads**
1-ton crew cab, 4x4	300	Diesel	2		5	2	0.5 mile/day and 4 structure pads/day
Road grader	350	Diesel	1		5	4	
Track type dozer	350	Diesel	1		5	6	
Drum type compactor	250	Diesel	1		5	4	
Water truck	350	Diesel	2		Duration	8	
Lowboy truck/trailer	500	Diesel	1		5	2	
Backhoe/front loader	350	Diesel	1		5	6	
Remove Existing H-Frame Poles (3)				**6**	**3**		**7 Steel Poles**
1-ton crew cab, 4x4	300	Diesel	2		3	5	3 poles/day
30-ton crane truck	300	Diesel	2		3	6	
Compressor trailer	120	Diesel	2		3	8	
Flat bed truck/trailer	350	Diesel	1		3	8	
10,000-lb rough terrain forklift	200	Diesel	1		3	4	
Remove Existing H-Frame Foundations (4)				**4**	**2**		**7 Steel Poles**
1-ton crew cab flat bed, 4x4	300	Diesel	1		2	8	4 grillage foundations/ day
10-cubic yard dump truck	350	Diesel	1		2	8	
Compressor trailer	120	Diesel	1		2	8	
Backhoe/front loader	350	Diesel	1		2	8	
Install Tubular Steel Pole Foundations (5)				**7**	**2**		**4 TSPs**
1-ton crew cab flat bed, 4x4	300	Diesel	3		2	2	2 TSPs/day
30-ton crane truck	300	Diesel	1		2	5	
Backhoe/front loader	200	Diesel	1		2	8	
Auger truck	500	Diesel	1		2	8	
10-cubic yard dump truck	350	Diesel	2		2	8	
Water truck	350	Diesel	1		2	8	
10-cubic yard concrete mixer truck	425	Diesel	3		2	3	

TABLE 3-12 CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY CONSTRUCT SINGLE-CIRCUIT 115kV TRANSMISSION LINE							
Work Activity						Activity Production	
Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Estimated Schedule (Days)	Estimated Average Duration of Use (Hrs/Day)	Estimated Production Per Day
Tubular Steel Pole/ Light Weight Steel H-Frame Haul (6)				**4**	**4**		**16 Steel Poles**
3/4-ton pick-up truck, 4x4	300	Diesel	2		4	5	4 steel poles/day
40-foot flat bed truck/trailer	350	Diesel	2		4	8	
80-ton rough terrain crane	350	Diesel	1		4	6	
Tubular Steel Pole/ Light Weight Steel H-Frame Assembly (7)				**8**	**8**		**16 Steel Poles**
3/4-ton pick-up truck, 4x4	300	Diesel	2		8	5	2 steel poles/day
1-ton crew cab flat bed, 4x4	300	Diesel	2		8	5	
Compressor trailer	120	Diesel	1		8	5	
80-ton rough terrain crane	350	Diesel	1		8	6	
Tubular Steel Pole/ Light Weight Steel H-Frame Erection (8)				**8**	**8**		**16 Steel Poles**
3/4-ton pick-up truck, 4x4	300	Diesel	2		8	5	2 steel poles/day
1-ton crew cab flat bed, 4x4	300	Diesel	2		8	5	
Compressor trailer	120	Diesel	1		8	5	
80-Ton Rough Terrain Crane	350	Diesel	1		8	6	
Install Conductor (9)				**16**	**1**		**0.15 Circuit Mile**
3/4-ton pick-up truck, 4x4	300	Diesel	3		1	8	0.35 mile/day
1-ton crew cab flat bed, 4x4	300	Diesel	2		1	8	
Wire truck/trailer	350	Diesel	2		1	2	
Dump truck (trash)	350	Diesel	1		1	2	
22-ton Manitex	350	Diesel	1		1	8	
Splicing rig	350	Diesel	1		1	2	
3 drum straw line puller	300	Diesel	1		1	4	
Lowboy truck/trailer	500	Diesel	1		1	2	

TABLE 3-12 CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY CONSTRUCT SINGLE-CIRCUIT 115kV TRANSMISSION LINE							
Work Activity						**Activity Production**	
Primary Equipment Description	**Estimated Horse-Power**	**Probable Fuel Type**	**Primary Equipment Quantity**	**Estimated Workforce**	**Estimated Schedule (Days)**	**Estimated Average Duration of Use (Hrs/Day)**	**Estimated Production Per Day**
Restoration (10)				**7**	**1**		**1.0 Mile**
1-ton crew cab, 4x4	300	Diesel	2		1	2	1 mile/day
Road grader	350	Diesel	1		1	6	
Backhoe	350	Diesel	1		1	6	
Front end loader	350	Diesel	1		1	6	
Track type dozer	350	Diesel	1		1	6	
Drum type compactor	250	Diesel	1		1	6	
Water truck	350	Diesel	1		1	8	
Lowboy truck/trailer	500	Diesel	1		1	3	
Crew Size Assumptions: #1 Survey = one 4-man crew #2 Roads and Landing Work = one 5-man crew #3 Remove Existing Lattice Steel H-Frame = one 6-man crew #4 Remove Existing H-Frame Foundations = one 4-man crew #5 Install Foundations for Tubular Steel Poles = one 7-man crew #6 TSP/LWS H-Frame Haul = one 4-man crew #7 TSP/LWS H-Frame Assembly = one 8-man crew #8 TSP/LWS H-Frame Erection = one 8-man crew #9 Conductor Installation = two 8-man crews #10 Restoration = one 7-man crew							

3.9 33KV DISTRIBUTION LINE

3.9.1 33kV Project System

A 33kV distribution system would be constructed to provide auxiliary power to the Ivanpah Substation. The station light and power will be served from approximately 400 feet of new ducts and one run of cable from the Nipton 33kV circuit to the location of the new station light and power transformer in the Ivanpah Substation. The location of the transformer will be determined during final engineering.

Approximately 1 mile of new underground 33kV circuitry and two new RCSs will be built in order to close the loop in the Nipton 33kV circuit. The addition will consist of two ducts and one run of cable. The proposed work will be done next to Densmore Drive Road. The first RCS will be located south of Ivanpah Substation and the second RCS will be located next to the Primm Golf Course.

Approximately 4,300 feet of new 12kV overhead line will be constructed between the town of Nipton and the new microwave site, northeast of Nipton. An overhead transformer will be installed with underground service to the microwave site. The line would be installed along the side of an existing dirt road.

Permanent and temporary land disturbance estimated for construction of the 33kV Project system is presented in Table 3-13. The construction equipment and workforce estimates required for construction of the 33kV Project system is shown in Table 3-14.

TABLE 3-13
ELDORADO-IVANPAH NIPTON 33KV LOOP LAND DISTURBANCE

Project Feature	Site Quantity	Disturbed Acreage Calculation (L x W)	Acres Disturbed During Construction	Acres Temporarily Disturbed	Acres Permanently Disturbed
Underground trench/duct for conduit	1	2,600 feet x 1.5 feet	0.09	0.09	0
Underground manhole installation	2	10 feet x 15 feet	0.01	0.01	0
Work area for underground manholes pulling area	2	40 feet x 60 feet	0.12	0.12	0
Work area pulling of 3/8 mile of 1/0 ACSR pole line construction	3	40 feet x 60 feet	0.12	0.12	0
Total Estimated			**0.34**	**0.34**	**0**

Note: 1. Underground trench is approximately 1.5 feet wide at most and 2,600 feet long from the existing padmount transformer to the proposed new underground dip pole. All construction is along existing paved and dirt roads at the perimeter of the Primm Valley Golf Course.

TABLE 3-14
ELDORADO-IVANPAH CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES
NIPTON 33KV LOOP

Work Activity						Activity Production	
Primary Equipment Description	**Estimated Horse-Power**	**Probable Fuel Type**	**Primary Equipment Quantity**	**Estimated Workforce**	**Estimated Schedule (Days)**	**Estimated Average Duration of Use (Hrs/Day)**	**Estimated Production Per Day**
Trenching, Structure Excavation (1)				4	8		
1-ton crew cab	300	Diesel	1			2	
Backhoe front loader	300	Diesel	1			8	
Overhead Line (2)				4	3		
1- ton crew cab, 4X4	300	Diesel	1	5	3	2	
55-foot double-bucket truck	350	Diesel	1		3	7	
50-foot digger derrick	350	Diesel	1		3	4	
Underground Cable Pulling (3)				4	2		
1-ton crew cab, 4X4	300	Diesel	1		2	2	
Router placer truck	350	Diesel	1		2	6	
Hydraulic rewind puller	300	Diesel	1		2	6	
Underground Cable Makeup (4)				8	60	10	
1-ton crew cab, 4X4	300	Diesel	1		4	2	
55-foot double-bucket truck	350	Diesel	1		4	4	

1. Trenching and Conduit Installation = one 4-man crew
2. Overhead Line Work = one 4-man crew
3. Underground Cable Pulling = one 4-man crew
4. Underground Cable Makeup

3.9.2 Pole Upgrade for Nipton 33kV All Dielectric Self Supporting Installation

As discussed in Section 3.6.1, the fiber optic path (Path 2-Section 3) from Nipton to the Ivanpah Substation includes the installation of fiber cables on existing Nipton 33kV distribution line wood poles. Distribution line poles would be replaced if the poles do not meet wind load requirement with the addition of fiber cable. A hole about 8 feet deep would be drilled next to the existing pole, and a new pole would be erected. The conductor would be transferred from the existing pole to the new pole. The old pole would be removed.

3.10 SUBSTATION CONSTRUCTION

3.10.1 Ivanpah Substation

3.10.1.1 Site Preparation

The grading of the Ivanpah Substation site and an access road to the site would be completed under the application of BrightSource with the CEC for their solar power generation facility. This component would include the 885-foot by 850-foot substation site, the 10-foot perimeter buffer, and the area containing cut and fill slopes resulting from grading.

The overall substation location would also require two transmission line access areas measuring approximately 1,015 feet by 400 feet or approximately 9 acres each. These areas are intended to provide room for the 115kV and 220kV transmission lines to turn into the station from the adjacent ROWs. Land disturbance would be limited to the actual structure erection locations, staging/pulling areas, and unpaved access roads.

The overall substation area is rectangular shaped measuring 1,650 feet by 1,015 feet consisting of approximately 38.5 acres, and is bounded by the existing SCE 115kV ROW on the south-eastern side and open BLM land on the other three sides.

The following elements of site preparation would be required for the Ivanpah Substation and are included in the scope of work provided by BrightSource under their Certificate of Environmental Compatibility application:

- Grade the entire 17-acre substation pad
- Grade the cut and fill side slopes to blend the existing terrain with the new pad
- Grade an earthen berm along the upslope pad boundaries to protect the substation from storm water runoff
- Grade and install the substation access roads
- Grade and install surface flow diversion/control measures

The following elements of site preparation would be required for the Ivanpah Substation and are included in the scope of work to be provided by SCE:

- Perform final grading
- Install approximately 3,500 feet of 8-foot-high perimeter fence with barbed wire surrounding the entire substation pad and one 30-foot-wide rolling gate
- Install new 4/0 copper conductor ground grid to cover the entire pad

The estimated number of persons and types of equipment required for construction of the Ivanpah substation are presented in Table 3-15.

TABLE 3-15
ELDORADO-IVANPAH TRANSMISSION PROJECT
CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY
TO BUILD IVANPAH SUBSTATION

Work Activity						Activity Production	
Primary Equipment Description	**Estimated Horse-Power**	**Probable Fuel Type**	**Primary Equipment Quantity**	**Estimated Workforce**	**Estimated Schedule (Days)**	**Estimated Average Duration of Use (Hrs/Day)**	**Estimated Production Per Day**
Survey Crew				2	15	10	
3/4 ton pick-up truck, 4X4	300	Diesel	2	2	15	4	Vehicle for transportation to and from work
John Deere Gator	20	Gas	2	2	40	6	Transport personnel around site
Grading Crew				5	40	10	
3/4 ton pick-up truck, 4X4	300	Diesel	5	5	40	4	Depending on soil conditions
Bulldozer	350	Diesel	1		40	4	
Dump truck	350	Diesel	1		40	6	
Paddle graders	350	Diesel	3		40	8	
Water truck	300	Diesel	1		40	4	
Front end loader	350	Diesel	1		40	8	
Maintenance truck	350	Diesel	1	1	40	4	
Compactor	350	Diesel	1		40	8	
Generator	20	Gas	1		40	4	
Fuel truck	350	Diesel	1		40	2	
Civil Crew				7	60	10	
3/4 ton pick-up truck, 4X4	300	Diesel	7	7	60	4	Depending on soil conditions
Bobcat	200	Diesel	1		60	8	
Backhoe	200	Diesel	1		60	8	
Drilling rig	350	Diesel	1		60	6	
Water truck	350	Diesel	1		60	4	
Compactor	200	Diesel	1		60	4	
John Deere Gator	20	Gas	2		60	4	
Generator	20	Gas	1		60	4	
Electrical Crew				8	60	10	
3/4 ton pick-up truck, 4X4	300	Diesel	8	8	60	4	
45ft Manlift	150	Diesel	1		60	6	
60ft Manlift	150	Diesel	1		60	6	
80 ton crane	300	Diesel	1		45	8	
10k Reach-all forklift	150	Diesel	1		60	6	
Generator	20	Gas	1		60	4	
John Deere Gator	20	Gas	2		60	4	

3.10.1.2 Earthwork Quantities Resulting from Foundation Excavation

Approximately 145 foundations of various sizes would be constructed throughout the substation pad to support equipment and steel structures. In addition, a network of partially buried concrete trenches and a buried grounding grid would be installed. Excavations of these foundations and trenches would commence following the completion of grading and other yard improvements and would continue for several weeks. The estimated total volume of soil that would need to be excavated for foundation and trenches is 1,250 cubic yards and would be spread on a portion of the substation property.

3.10.1.3 Paving

Asphalt concrete paving shall be applied to all designated internal driveways over an aggregate base material and a properly compacted sub-grade as recommended by the geotechnical investigation during final engineering.

Asphalt concrete paving will be installed after all major construction had been completed.

3.10.1.4 Rock Surfacing

All areas within the substation perimeter that are not paved or covered with concrete foundations or trenches shall be surfaced with a 4-inch layer of untreated, 0.75-inch nominal crusher run rock.

The rock shall be applied to the finished grade surface after all construction has been completed.

3.10.1.5 Spill Prevention Control and Countermeasures

The presence of oil in a quantity greater than 1,320 gallons invokes Spill Prevention Control and Countermeasures (SPCC) regulations. The quantity of oil contained in any one of the planned 220/115kV transformers would be in excess of the minimum quantity required by law.

The control of oils spills through secondary containment would be designed by a licensed California Registered Professional Engineer. The permanent or temporary SPCC measures would be in place prior to the delivery of transformers to the site. Improvements may consist of, but not be limited to, trenches, holding areas, retention basins, and curbs.

An SPCC plan would be prepared and maintained on-site. Substation operating personnel will be trained in the execution of the plan.

3.10.1.6 Storm Water Pollution Prevention Plan

During construction activities, measures will be in place to ensure that contaminates are not discharged from the construction site.

An SWPPP shall be developed that will define areas where hazardous materials such as concrete are to be stored; where trash will be placed; where rolling equipment shall be parked, fueled, and serviced, and where construction materials such as reinforcing bars and structural steel members are staged.

Erosion control during grading of the unfinished site and during subsequent construction shall be in place and monitored as specified by the SWPPP. A silting basin(s) shall be established to capture silt and other materials which might otherwise be carried from the site by rainwater surface runoff.

Approximately 20 percent of the completed substation would consist of impervious materials such as concrete foundations and asphalt concrete paving.

3.10.1.7 Perimeter Security

The entire substation area shall be enclosed by perimeter gates and fencing.

Perimeter fencing would conform to SCE's requirements for electrical substations and have a minimum height of 8 feet above the adjacent finished grade to the outside of the substation.

All perimeter fences and gates would be fitted with barbed wire. A motion sensing system would be attached to the perimeter fence to detect attempted unauthorized entry.

3.10.2 Eldorado Substation

The project requires two 220kV line positions to terminate the new Ivanpah No.1 and No.2 220kV transmission lines. The installation of the two additional positions requires that the existing 220kV Switchyard be extended 165 feet to the West within the existing substation fence. Upgrades to existing 220 kV circuit breakers and upgrades to 500 kV series capacitors within the existing substation fence may also be required, depending on electrical system requirements. An existing 220/115kV transformer bank would be removed.

3.11 TELECOMMUNICATION SYSTEM CONSTRUCTION

The Proposed Project telecommunications system is described in Section 3.6. Permanent and temporary land disturbance estimated for construction of the telecommunication system along the proposed and alternate telecommunication paths is presented in Tables 3-16 to 3-22.

Construction of the Proposed Project is planned to be performed by contract personnel with SCE responsible for Project administration and inspection. The construction equipment and work force estimates required for each phase of construction on the proposed and alternative telecommunication paths is shown in Tables 3-23 and 3-24. At some stages of the Project, multiple locations would be under construction simultaneously. This may involve independent construction teams.

3.11.1 Construction Activities for Installation of Optical Ground Wire on the Eldorado-Lugo 500kV Transmission Line

As discussed in Section 3.6.1, the proposed telecommunication system (Figure 3.1-1, located in the Map Volume) is composed of two paths. The first telecommunication path (Path 1) from the Eldorado Substation to the proposed Ivanpah Substation uses new OPGW proposed to be constructed along the new 220kV transmission line route from the Eldorado Substation to the Ivanpah Substation. The approximate length of the path is 35 miles.

The second telecommunication path (Path 2) from the Eldorado Substation to the Ivanpah Substation consists of three sections. The Section 1 route extends from the Eldorado Substation to a 500kV tower (M152-T2) of the existing Eldorado-Lugo 500kV transmission line near the intersection of Highway 164 and the 500kV ROW. Approximately 25 miles of the existing Lugo-Eldorado 500kV transmission line will need to have one of the two existing half-inch steel OHGW replaced with OPGW. It is estimated that approximately 45 of the existing structures along this route will require some form of structural modifications to accommodate the replacement of the OHGW with OPGW. The exact number of structures and the specific type of modifications will be determined once final engineering has been completed. The construction equipment and workforce estimates required for each phase of construction of all Path 2 Sections except for Path 2-Section 1 is shown in Table 3-23. The construction equipment and workforce estimates required for each phase of construction of the Path 2-Section 1 telecommunication path is shown in Table 3-24.

Modifications of the existing Eldorado-Lugo 500kV towers may include the static peaks, structure body reinforcement, body extension, installation of horizontal diaphragms, and structure legs reinforcement. Detail drawings and procedures for each of the structure modifications are to be developed for fabrication and installation. The modifications to be performed on each structure are identified by bundles. Each bundle will contain those components necessary to complete the required modifications, such as new steel angles to form back to back angles to the existing leg diagonals, redundant braces to the longitudinal and transverse faces, oblique braces between leg diagonals, and a new horizontal diaphragm. New redundant members will also be designed and installed at the ground peaks to support the OPGW clip-in hardware. The loading capacity of the upgraded structure structures will be able to support the loads for the new OPGW installation and meets the requirements of CPUC GO 95 (for the state of California) and NESC (for the state of Nevada). Final structure modification and associated construction activities will be determined once final engineering is completed by the contractor.

TABLE 3-16 ELDORADO-IVANPAH PROJECT TELECOMMUNICATIONS SYTEM – PATH 1 LAND DISTURBANCE					
Project Feature	**Site Quantity**	**Disturbed Acreage Calculation (L X W)**	**Acres Disturbed During Construction**	**Acres Temporarily Disturbed**	**Acres Permanently Disturbed**
Underground trench/duct for fiber entrance to Eldorado Substation (1)	1	500 feet x 1.5 feet	0.02	0.02	0
Underground trench/duct for fiber entrance to Ivanpah Substation (1)	1	500 feet x 1.5 feet	0.02	0.02	0
Work area outside Eldorado Substation	1	40 feet x 60 feet	0.06	0.06	0
Work area Ivanpah Substation	1	40 feet x 60 feet	0.06	0.06	0
Total Estimated			0.16	0.16	0
Note: (1) Underground trench is approximately 1.5 feet wide, at most 500 feet long from the last structure to the substation fence line.					

TABLE 3-17 ELDORADO-IVANPAH PROJECT TELECOMMUNICATIONS SYSTEM – PATH 2-SECTION 1 LAND DISTURBANCE					
Project Feature	**Site Quantity**	**Disturbed Acreage Calculation (L X W)**	**Acres Disturbed During Construction**	**Acres Temporarily Disturbed**	**Acres Permanently Disturbed**
Retrofit Existing Lattice Steel Structure (1)	45	150 feet x 150 feet	23.2	12.5	10.8
OPGW Stringing Setup Area – Tensioner (2)	9	50 feet x 100 feet	1.0	1.0	0
OPGW Stringing Setup Area – Puller (2)	9	50 feet x 100 feet	1.0	1.0	0
Nipton – Material and Equipment Staging Area	1	approximately 2.5 acres	2.5	2.5	0
Total Estimated (3)			27.8	17.0	10.8
Notes: (1) Includes structure assembly and erection, and OPGW installation: area to be restored after construction, existing portion of row within 25 feet of the lattice steel structure footings to remain cleared of vegetation. The 10.8 acres is pre-existing permanently disturbed area around the structure for ongoing operation and maintenance access by SCE. (2) Based on 20,000 feet OPGW reel lengths, and route design. (3) The disturbed acreage calculations are estimates based upon SCE's preferred area of use for the described Project feature, the width of the existing ROW, or the width of the proposed ROW, and do not include any new access/spur road information; they are subject to revision based upon final engineering and review of the Project by SCE's Construction Manager.					

TABLE 3-18 ELDORADO-IVANPAH PROJECT TELECOMMUNICATIONS SYSTEM – PATH 2-SECTION 2 LAND DISTURBANCE					
Project Feature	**Site Quantity**	**Disturbed Acreage Calculation (L X W)**	**Acres Disturbed During Construction**	**Acres Temporarily Disturbed**	**Acres Permanently Disturbed**
Work area at 500kV tower M172	1	40 feet x 80 feet	0.06	0.06	0
4.8 Mile underground fiber cable duct (1)	1	1.5 feet x 25,200 feet	0.87	0.87	0
Underground vaults	21	6 feet x 6 feet	0.02	0	0.02
Work Area for underground vaults and fiber pulling area	5	40 feet x 60 feet	0.28	0.28	0
Total Estimated			1.21	1.21	0.02
Note: (1) The calculated disturbed area is the worst case using trench method; if horizontal "boring" method is used, the disturbed area would be greatly reduced.					

TABLE 3-19 ELDORADO-IVANPAH PROJECT TELECOMMUNICATIONS SYSTEM – PATH 2-SECTION 3, SHARED ALTENATES 1 AND 2 LAND DISTURBANCE					
Project Feature	**Site Quantity**	**Disturbed Acreage Calculation (L X W)**	**Acres Disturbed During Construction**	**Acres Temporarily Disturbed**	**Acres Permanently Disturbed**
9-Mile underground fiber cable duct (1)	1	1.5 feet x 47,250 feet	1.63	1.63	0.0
Underground vaults	48	6 feet x 6 feet	0.04	0.0	0.04
Work area for underground vaults and fiber pulling area	10	40 feet x 60 feet	0.55	0.55	0.00
Work area for fiber pulling of 1-mile of ADSS pole line construction	1	40 feet x 60 feet	0.06	0.068	0
Total Estimated			2.27	2.23	0.04
Note: (1) The calculated disturbed area is the worst case using trench method; if horizontal "boring" method is used, the disturbed area would be greatly reduced.					

TABLE 3-20 ELDORADO-IVANPAH PROJECT TELECOMMUNICATIONS SYSTEM – PATH 2-SECTION 3-ALTERNATE 1 LAND DISTURBANCE					
Project Feature	**Site Quantity**	**Disturbed Acreage Calculation (L X W)**	**Acres Disturbed During Construction**	**Acres Temporarily Disturbed**	**Acres Permanently Disturbed**
1-Mile underground fiber cable duct (2)	1	1.5 feet x 5,280 feet	0.18	0.18	0
Underground vaults	6	6 feet x 6 feet	0.01	0	0.01
Work area for underground vaults and fiber pulling area	1	40 feet x 60 feet	0.06	0.06	0
Work area for fiber pulling of 12 miles of ADSS pole line construction	12	40 feet x 60 feet	0.67	0.67	0
Total Estimated			0.92	0.91	0.01
Note: (1) The calculated disturbed area is the worst case using trench method; if horizontal “boring” method is used, the disturbed area would be greatly reduced.					

TABLE 3-21 ELDORADO-IVANPAH PROJECT TELECOMMUNICATIONS SYTEM – PATH 2-SECTION 3-ALTERNATE 2 LAND DISTURBANCE					
Project Feature	**Site Quantity**	**Disturbed Acreage Calculation (L X W)**	**Acres Disturbed During Construction**	**Acres Temporarily Disturbed**	**Acres Permanently Disturbed**
1-Mile underground fiber cable duct (1)	1	1.5 feet by 5,280 feet	0.18	0.18	0
Underground vaults	6	6 feet by 6 feet	0.01	0	0.01
Work area for underground vaults and fiber pulling area	1	40 feet x 60 feet	0.01	0.01	0.00
Work area for fiber pulling of 8 miles of ADSS pole line construction	8	40 feet x 60 feet	0.44	0.44	0
Total Estimated			0.64	0.63	0.01

TABLE 3-22 ELDORADO-IVANPAH PROJECT TELECOMMUNICATIONS SYSTEM – PATH 3A LAND DISTURBANCE					
Project Feature	**Site Quantity**	**Disturbed Acreage Calculation (L X W)**	**Acres Disturbed During Construction**	**Acres Temporarily Disturbed**	**Acres Permanently Disturbed**
Build new Microwave communication site	1	100 feet x 100 feet	0.23	0	0.23
Placing 0.7 mile of fiber optic cable	1	1.5 feet x 3,700 feet	0.125	0.125	0.00
Work area for underground vaults and fiber pulling area	2	**40 feet x 60** feet	0.11	0.11	0.004
Total Estimated			0.46	0.23	0.23

TABLE 3-23 ELDORADO-IVANPAH PROJECT CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY TELECOMMUNICATION SYSTEM (All Paths Except Path 2-Section 1)						
Work Activity	**Probable Fuel Type**	**Primary Equipment Quantity**	**Estimated Workforce**	**Schedule (days)**	**Estimated Average Duration of Use (Hrs/Day)**	**Estimated Production Per Day**
PATH 1						
OPGW splice						**30 splices, 60 miles**
OPGW splice			3	30		**1 splice/day**
Outside Plant Splicing Lab Vehicle		1		30	8	
1/2 ton pick-up truck, 4 x 4		1		30	8	
PATH 2-SECTION 1						
(Refer to Table 3.24)						
PATH 2-SECTION 2						
Underground fiber cable installation		1	4			**4.8 miles** **6,000 feet/day**

TABLE 3-23 ELDORADO-IVANPAH PROJECT CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY TELECOMMUNICATION SYSTEM (All Paths Except Path 2-Section 1)						
Work Activity	**Probable Fuel Type**	**Primary Equipment Quantity**	**Estimated Workforce**	**Schedule (days)**	**Estimated Average Duration of Use (Hrs/Day)**	**Estimated Production Per Day**
Pulling/Installing				5		
fiber cable		1				
½ ton pick-up				5		
truck,		1			8	
4 x 4 Telsa Cable				5	8	
stringing truck						
Splicing Van				5	8	**400 feet/day**
Install		1				
Underground			4	66		
duct		1				
		1				
Backhoe/front loader				66	8	
Dump truck				66	8	
½ ton pick-up, 4 x 4				66	8	
<u>PATH 2-SECTION 3, ALTERNATE 1</u>						
Underground fiber cable installation						**9 miles**
Pulling/installing fiber cable			4	8		**6,000 feet/day**
½ ton pick-up truck, 4 x 4	Diesel	1		8	8	
Telsa Cable stringing truck	Diesel	1		8	8	
Splicing Van	Diesel	1		4	8	
Install Underground duct			4	119		**400 feet/day**
Backhoe/front loader	Diesel	1		119	8	
Dump truck	Diesel	1		119	8	

TABLE 3-23 ELDORADO-IVANPAH PROJECT CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY TELECOMMUNICATION SYSTEM (All Paths Except Path 2-Section 1)						
Work Activity	**Probable Fuel Type**	**Primary Equipment Quantity**	**Estimated Workforce**	**Schedule (days)**	**Estimated Average Duration of Use (Hrs/Day)**	**Estimated Production Per Day**
1/2 Ton Pick-up Truck, 4 x 4	Diesel	1		119	8	
Install ADSS fiber on pole line						**6 miles**
Install cross arms on poles			4	7		**5,000 feet/day**
	Diesel	1		7	8	
½-ton pick-up truck, 4 x 4						
	Diesel	2		7	8	
Telsa Cable stringing truck						**8,000 feet/day**
			4	4		
Install ADSS fiber on pole line	Diesel	1		4	8	
	Diesel	2		4	8	
½-ton pick-up Truck, 4 x 4						
Telsa Cable stringing truck						**10 miles**
<u>PATH 2-SECTION 3, ALTERNATE 2</u>						**6,000 feet/day**
Under ground fiber cable installation			4	9		
	Diesel	1		9	8	
Pulling/installing fiber cable						
	Diesel	1		9	8	
½-ton pick up truck, 4 x 4						
	Diesel	1		4	8	**400 feet/day**
Telsa Cable stringing truck						
			4	132		

TABLE 3-23
ELDORADO-IVANPAH PROJECT CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY TELECOMMUNICATION SYSTEM
(All Paths Except Path 2-Section 1)

Work Activity	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Schedule (days)	Estimated Average Duration of Use (Hrs/Day)	Estimated Production Per Day
Splicing Van						
				132	8	
Install underground	Diesel	1				
duct				132	8	
	Diesel	1				
Backhoe/front						**7 miles**
loader	Diesel	1		132	8	
Dump truck						**5,000 feet/day**
½-ton pickup						
			4	8		
Install ADSS fiber on pole line	Diesel	1		8	8	
Install cross						**8,000 feet/day**
arms on Poles	Diesel	2		8	8	
½-ton pick-up truck, 4 x 4			4	5		
Bucket truck	Diesel	1		5	8	
Install ADSS fiber on pole line	Diesel	1		5	8	
½-ton pick-up truck, 4 x 4	Diesel	1		2	8	
						N/A
Telsa Cable stringing truck						
Splicing Van			8	68		
<u>PATH 2-</u>					4	
<u>SECTION 3A</u>	Diesel	1		15		
MW site					4	
tower/shelter installation	Diesel	1		8		

TABLE 3-23
ELDORADO-IVANPAH PROJECT CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY TELECOMMUNICATION SYSTEM
(All Paths Except Path 2-Section 1)

Work Activity	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Schedule (days)	Estimated Average Duration of Use (Hrs/Day)	Estimated Production Per Day
1-ton crew cab 4 x 4	Diesel	1		3	2	
Crane	Diesel	1		7	6	
	Diesel	1		7	6	
Flat-bed truck	Diesel	1		15	4	
Drill rig	Diesel	1		2	6	
Dump truck	Diesel	1		2	6	
2-ton truck	Diesel	1		10	4	
						0.7 mile
Concrete truck	Diesel	1		10	6	
Concrete pump						**6,000 feet/day**
Fork lift						
Backhoe/front loader						
			4	1		
Underground fiber cable installation	Diesel	1		1	8	
Pulling/installing fiber cable	Diesel	1		1	8	**400 feet/day**
½-ton pick-up truck, 4 x 4	Diesel	1		1	8	
Telsa Cable stringing truck				4	10	
Splicing Van	Diesel	1		10	8	
Install Underground duct	Diesel	1		10	8	

TABLE 3-23
ELDORADO-IVANPAH PROJECT CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY TELECOMMUNICATION SYSTEM
(All Paths Except Path 2-Section 1)

Work Activity	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Schedule (days)	Estimated Average Duration of Use (Hrs/Day)	Estimated Production Per Day
Backhoe/front loader Dump truck ½-ton pick-up truck, 4 x 4	Diesel	1		10	8	

Notes:
1. Includes structure assembly and erection, and OPGW installation; area to be restored after construction, existing portion of ROW within 25 feet of the Lattice Steel Structure footings to remain cleared of vegetation.
2. Based on 20,000 feet OPGW reel lengths and route design.
3. The disturbed acreage calculations are estimates based upon SCE's preferred area of use for the described project feature, the width of the existing ROW, or the width of the proposed ROW, and they do not include any new access/spur road information; they are subject to revision based upon final engineering and review of the Project by SCE's construction manager and/or contractor awarded Project.

TABLE 3-24
CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY RETROFIT EXISTING 500kV TRANSMISSION LINE TOWERS AND OPTICAL GROUND WIRE INSTALLATION PATH 2-SECTION 1

Work Activity						Activity Production	
Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Estimated Schedule (Days)	Estimated Average Duration of Use (Hrs/Day)	Estimated Production Per Day
Marshalling Yard (1)				**4**			
1-ton crew cab 4x4	300	Diesel	1		Duration of project	2	
30-ton crane truck	300	Diesel	1			2	
10,000-lb rough terrain fork lift	200	Diesel	1			5	
Truck, semi, tractor	350	Diesel	1			1	
Roads and Landing Work (2)				**5**	**13**		**25 miles**
1-ton crew cab, 4x4	300	Diesel	2		13	2	0.5 mile/day and 4 structure pads/day
Road grader	350	Diesel	1		13	4	
Track type dozer	350	Diesel	1		13	6	
Drum type compactor	250	Diesel	1		13	4	
Water truck	350	Diesel	2		Duration	8	
Lowboy truck/trailer	500	Diesel	1		6	2	
Backhoe/front loader	350	Diesel	1		13	6	
LST Steel Haul (3)				**4**	**45**		**45 LSTs**
1-ton crew cab flat bed, 4x4	300	Diesel	2		45	2	1 LST/day
40-foot flat bed truck/trailer	350	Diesel	1		45	8	
10,000-lb rough terrain fork lift	200	Diesel	1		45	6	

TABLE 3-24
CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY
RETROFIT EXISTING 500kV TRANSMISSION LINE TOWERS AND
OPTICAL GROUND WIRE INSTALLATION PATH 2-SECTION 1

Work Activity						Activity Production	
Primary Equipment Description	**Estimated Horse-Power**	**Probable Fuel Type**	**Primary Equipment Quantity**	**Estimated Workforce**	**Estimated Schedule (Days)**	**Estimated Average Duration of Use (Hrs/Day)**	**Estimated Production Per Day**
LST Retrofit (4)				**14**	**45**		**45 LSTs**
¾-ton pick-up truck, 4X4	300	Diesel	3		45	4	1 LST/day
1-ton crew cab flat bed, 4x4	300	Diesel	2		45	4	
30-ton crane truck	300	Diesel	2		45	8	
80-Ton Rough Terrain Crane	350	Diesel	1		45	8	
80-foot hydraulic man-lift/bucket truck	350	Diesel	1		45	6	
Compressor trailer	350	Diesel	2		45	6	
Remove Existing OHGW and Install OPGW (5)				**15**	**72**		**25 circuit miles**
1-ton crew cab flat bed, 4x4	300	Diesel	2		72	8	0.35 mile/day
¾-ton pick-up truck, 4x4	300	Diesel	4		72	8	
Dump truck (trash)	350	Diesel	1		72	2	
20,000-lb. rough terrain fork lift	350	Diesel	1		72	2	
30-ton crane truck	300	Diesel	1		72	4	
Bull wheel puller	500	Diesel	1		24	4	
Splicing lab	300	Diesel	4		9	8	
80-foot hydraulic man-lift/bucket truck	350	Diesel	1		36	6	
Static truck/ tensioner	350	Diesel	1		72	2	
Hydraulic rewind puller	300	Diesel	1		24	4	
Hughes 500 E Helicopter		Jet A	1		24	4	
Fuel, helicopter support truck	300	Diesel	1		24	2	
Restoration (6)				**7**	**25**		**25 miles**
1-ton crew cab, 4x4	300	Diesel	2		25	2	1 mile/day
Road grader	350	Diesel	1		25	6	
Backhoe	350	Diesel	1		25	6	
Front end loader	350	Diesel	1		25	6	
Track Type Dozer	350	Diesel	1		25	6	
Drum type compactor	250	Diesel	1		25	6	
Water truck	350	Diesel	1		25	8	
Lowboy truck/trailer	300	Diesel	1		25	3	

Crew Size Assumptions:
#1 Marshalling Yards = one 4-man crew
#2 Roads and Landing Work = one 5-man crew
#3 LST Steel Haul = one 4-man crew
#4 LST Steel Assembly = two 7-man crews
#5 Remove Existing OHGW and Install OPGW = one 15-man crew
#6 Restoration = one 7-man crew

3.11.2 <u>Typical Telecommunication Construction Activities</u>

3.11.2.1 Optical Ground Wire Installation on Structures

Typical construction activities include the following: An OPGW will be installed on the existing transmission line for Proposed Project communication purposes. The OPGW would be installed in the same manner as the conductor. It is typically installed in continuous segments of 19,000 feet or less depending upon various factors including line direction, inclination, and accessibility. Following installation of the OPGW, the strands in each segment are spliced together to form a continuous length from one end of a transmission line to the other. At a splice structure, the fiber cables are routed down a structure leg where the splicing occurs. The splices are housed in a splice box (typically a 3-foot x 3-foot x 1-foot metal enclosure) that is mounted to one of the structure legs some distance above the ground. On the last tower at each end of a transmission line, the overhead fiber is spliced to another section of fiber cable that runs in underground conduit from the splice box into the communication room inside the adjacent substation.

3.11.2.2 All Dielectric Self Supporting Installation on Poles

The overhead fiber optic cable would be installed by attaching cross arms on distribution poles. This would require the use of a bucket truck. One 4-man crew and two trucks would be used. A crew can install up to 2,000 feet of cable in 1 day. A crew can complete three splices in 1 day.

Overhead fiber optic cable stringing includes all activities associated with the installation of cables onto cross arms on existing wood pole structures. This activity includes the installation of vibration dampeners, and suspension and dead-end hardware assemblies. Stringing sheaves (rollers or travelers) are attached during the framing process. A standard wire stringing plan includes a sequenced program of events starting with determination of cable pulls and cable pulling equipment set-up positions. Advanced planning by supervision determines pulling locations, times, and safety protocols needed for ensuring that safe and quick installation of cable is accomplished.

Fiber optic cable pulls typically occur every 10,000 feet to 20,000 feet over flat or mountainous terrain. Fiber optic cable splices are required at the ends of each cable pull. Fiber optic cable pulls are the length of any given continuous cable installation process between two selected points along the existing overhead or underground structure line. Fiber optic cable pulls are selected, where possible, based on availability of pulling equipment and designated dead-end structures at the ends of each pull, geometry of the line as affected by points of inflection, terrain, and suitability of fiber optic cable stringing and splicing equipment set ups. The dimensions of the area needed for stringing set ups varies depending upon the terrain; however, a typical stringing set up is 40 feet by 60 feet. Where necessary due to space limitations, crews can work from within a smaller area.

3.11.2.3 Installation in Conduit

For the installation of the fiber optic cable in existing and new underground conduit, a high-density polyethylene smoothwall innerduct would be used. Innerduct facilitates the installation of the fiber optic cable, provides protection, and helps identify the cable. The innerduct is installed first inside the conduit. The fiber optic cable is then installed inside the innerduct.

For splicing OPGW cables, special Outside Plant Splicing Lab Vehicles and Foreman Trucks would be used to travel to various splicing locations. Two crews including six splicers would be deployed for OPGW splicing work. Each 3-man crew consists of two Splicing Lab Vehicles and one Foremen Truck. Each crew would complete one OPGW splice a day. The work space required would be a 30 feet by 40 feet area. The crew would bring the OPGW cable ends into the Splice Labs and splice together the two ends. After the cables are spliced, the splice case would be placed inside the OPGW splice cabinet. The slack loop would be coiled around the back of the cabinet.

Distribution line poles would be replaced if the pole does not meet wind load requirement with addition of fiber cable. Replacing distribution line pole requires a 5-man crew, 1 pole trailer truck, 1 pole digger truck, and 1 crew truck. An approximate 30-foot x 40-foot work area is required for the work. A hole about 8 feet in depth would be drilled next to the existing pole, and a new pole would be erected. A conductor would be transferred from the existing pole to the new pole and the old pole would be cut or removed.

Connecting the OPGW with the substation requires several steps. The splice box would be mounted 20 feet to 30 feet above ground on the last transmission structure to the substation fence line. About 25 feet of 5 inch vertical riser conduit would be installed to reach the splice box from ground. A trench would be dug from the structure to the substation fence line. The trench would be dug about 3 feet deep and 1.5 feet wide. A 5-inch conduit would be placed inside the trench from the structure to the substation fence line. A layer of slurry would be poured over the conduit for additional protection, and the dug up soil would be used to backfill the trench. At the fence line, the conduit would be connected to the conduit/trench inside the substation. Optical Fiber Nonconducting Riser (OFNR) type fiber cable would be pulled from the substation MEER through the substation trench/conduit and the last structure interface buried conduit and riser conduit to the splice box on the structure. After the OPGW cable and OFNR cable are spliced, the splice case is placed inside. The splice box and the slack loop are coiled around the back of the box. About 40 feet by 60 feet of work area would be required for this job, two splice trucks with pulling equipment and a 4-man crew would be required to do the cable installation. Two splice trucks and a 3-man crew would be required to complete the fiber optic splicing.

3.11.2.4 Installation of Microwave Tower/Communication Site

An approximate 100-foot by 100-foot area is required for new communication site. Perimeter chain link fence would be built around the communication site. Typical communication sites consist of a communication building, microwave tower, and generator/fuel tank. A typical communication building is either a block wall-type building to be constructed on-site or prefabricated building to be delivered to the job site. The prefabricated building would be set on a concrete foundation using a crane. The typical building size is 36 feet by 12 feet; it consists of a generator room and an equipment room. The generator room is to house emergency backup generator and manual/automatic AC switch equipment. Microwave equipment, DC power equipment, and other telecom equipment would be installed in the equipment room. A separate concrete pad with 10-foot separation from the communication building would be constructed for fuel tank installation.

The required area for a typical free-standing, 4 legged lattice steel communications tower is 25 feet by 25 feet; the tower would be built outside the communication room or next to the MEER in the substation. Concrete footings would be installed to support the tower. Heavy equipment needed for construction includes ready-mixed concrete trucks for the footings and a crane for tower erection and antenna installation. Tractor-trailer vehicles would be used to transport steel tower components. A six- to eight-man crew may be on-site at any given time for tower construction and antenna installation.

Construction would consist generally of the following steps:

- Site preparation
- Erect temporary fencing area
- Set the foundations
- Install prefab building, fuel tanks, and emergency generator
- Erect the antenna tower (where necessary)
- Install telecommunications equipment and/or antennas
- Erect permanent fencing
- Site cleanup

It typically would take approximately 6 months to construct a new communication site.

3.12 OPERATION AND MAINTENANCE

Following the completion of Project construction, operation and maintenance of the new lines would commence. Operation and maintenance activities would occur at least once per year. Inspection and maintenance activities would include the following:

- Routine line patrols by both aircraft and truck
- Routine, patrol identified structure and wire maintenance
- Routine line washing
- Routine, patrol identified earth and sand abatement from footings
- Routine ROW road maintenance

The frequency of inspection and maintenance would depend on various conditions, including length of the line and weather effects. Inspection and maintenance activities typically include senior patrolman, foreman, lead lineman, journeyman lineman, apprentices, groundmen, helicopter pilots, equipment operators, and laborers. If the magnitude of repairs identified by routine patrols is substantial, other specialized employees such as surveyors, engineers, clerical personnel, and technicians would be attached to maintenance crews, as required, to address any unique problem that may arise due to such variables as substantial storm damage or vandalism.

SCE operates two types of helicopters for patrols of transmission lines: American Eurocopter AS-350D (B-2) (B-3) and Hughes 500. During a typical patrol, a helicopter would fly at or near the elevation of the point of support of the conductor. In populated areas, patrols would fly at higher elevations or away from the centerline of the transmission lines, in order to avoid flying close to houses or penned animals.

In cases where flying near a populated area cannot be avoided, the patrolman would use gyro-binoculars so as to increase the inspection distance between the structures and the helicopter to the greatest extent possible. In rural areas, unless designated otherwise, proximity to the ground is not restricted, with the exception of safety and environmental concerns.

The entire Eldorado-Ivanpah transmission line corridor would be patrolled every year. The yearly patrol method alternates each year between helicopter and truck. In 1 year, the patrol would be by helicopter and would take approximately 1 day (8 hours) to accomplish. The next year, the patrol would be performed by truck and would take 5 days. A yearly patrol is a minimum patrol requirement. Increases in pollution and population density in the vicinity of the proposed transmission line corridor may cause SCE to increase the patrol frequency of the line. These additional patrols would be performed by helicopter or patrol truck.

Starting approximately 15 years after the operational date, maintenance on the proposed line would be expected to increase. Initial additional corridor maintenance would be due principally to weather and vandalism to the new line. As insulators and steel age on the line, the frequency of lattice steel structure hardware maintenance activities such as bolt torquing will increase.

3.13 REMOVAL AND RESTORATION

Prior to removal or abandonment of the facilities that would be permitted to be constructed on BLM lands or within a reasonable time following termination of the BLM ROW grant, SCE would prepare a removal and restoration plan. The removal and restoration plan would address removal of SCE facilities from the permitted area, and any requirements for habitat restoration and revegetation. The removal and restoration plan would then be approved by the BLM before implementation.

4.0 IMPACTS AND MITIGATION

SECTION 4.0
ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION

INTRODUCTION

This section of the PEA presents an assessment of potential environmental impacts that would be associated with construction and operation of the Proposed Project, including the transmission, subtransmission, substation, and telecommunication facilities described in detail in Section 3.0 (Project Description). Existing environmental conditions are presented in a sufficient level of detail to meet CPUC CEQA Rules (Rule 2.4 CEQA Compliance) and to support and form the basis for environmental impact assessments. The assessments presented herein consider baseline environmental conditions, applicable regulations, plans, and standards and impact significance criteria, which consist of the criteria contained in CEQA, Appendix G. This section also presents APMs that have been incorporated into the Proposed Project's design and construction plans to minimize the Proposed Project's potential environmental impacts during the construction and operational phases. APMs are presented at the beginning of the section and within each resource discipline segment assessment, as applicable. APMs are proposed by SCE as a part of Project design mitigation measures; however, they are proposed as a way of avoiding, minimizing, or mitigating potential significant impacts that may result due to implementation of the Project.

A summary of project-related potentially significant adverse environmental effects is presented in this section. A completed CEQA Initial Study Checklist is presented in Appendix A of this PEA.

The balance of this section is organized as follows:

- 4.1 Aesthetic Resources
- 4.2 Agricultural Resources
- 4.3 Air Quality
- 4.4 Biological Resources
- 4.5 Cultural and Paleontological Resources
- 4.6 Geology, Mineral Resources, and Soils
- 4.7 Hazards and Hazardous Materials
- 4.8 Hydrology and Water Quality
- 4.9 Land Use Planning
- 4.10 Noise
- 4.11 Population and Housing
- 4.12 Public Services
- 4.13 Recreation
- 4.14 Transportation and Traffic
- 4.15 Utilities and Service Systems

In addition, technical backup reports and/or related consultations are presented in appendices to this document.

Table 4-1 lists the APMs that are referenced in this chapter. SCE intends to comply with these APMs unless deviations are needed to address emergencies or comply with established safety requirements.

TABLE 4-1 APPLICANT PROPOSED MEASURES	
APM No.	**Eldorado – Ivanpah Transmission Project APM Description**
AESTHETIC RESOURCES	
AES-1	**Road Cut Rock Staining.** Where new roads are required in the South McCullough Mountains to access new or existing transmission and subtransmission towers, SCE would consult with the BLM regarding feasible methods to treat the exposed rock to match the overall color of the adjacent weathered rock.
AES-2	**Seeding and Inter-Planting.** Where new roads are required in the South McCullough Mountains to access new or existing transmission and subtransmission towers, road cuts would be treated by seeding and/or inter-planting into the disturbed areas to restore the area to an appearance that will blend back into the overall landscape context.
AES-3	**Non-Reflective Finish.** LSTs and TSPs would be constructed of steel that is galvanized and treated at the factory to create a dulled finish that will reduce reflection of light off of the tower members. As appropriate to the environment, the galvanized coating would also be treated to allow the towers to blend into the backdrops. Non-specular transmission cable would be installed for the new transmission line to minimize conductor reflectivity.
AES-4	**Regrade/Revegetate Construction Sites.** Areas around new or rebuilt transmission and subtransmission structures that must be cleared during the construction process would be regraded and revegetated to restore the area to an appearance that would blend back into the overall landscape context.
AES-5	**Use Existing Access Roads.** To the extent feasible, existing access roads would be used.
AES-6	**Minimize Road Modifications.** Widening and grading of roads would be kept to the minimum required for access by Proposed Project construction equipment.
AES-7	**Dust Suppression.** During the construction period, dust suppression measures would be used to minimize the creation of dust clouds potentially associated with the use of the access roads.
AES-8	**Substation Lighting Control.** The substation lighting would be designed to be manually operated only when required for non-routine nighttime work. The lighting would be directed downward and shielded to eliminate off-site light spill at times when the lighting might be in use.
BIOLOGY RESOURCES	
BIO-1	**Preconstruction surveys.** Preconstruction biological clearance surveys will be conducted to identify special-status plants and wildlife.
BIO-2	**Minimize vegetation impacts.** Every effort will be made to minimize vegetation removal and permanent loss at construction sites. If necessary, native vegetation will be flagged for avoidance.
BIO-3	**Avoid impacts to state and federal jurisdiction wetlands.** Construction crews will avoid impacting the streambeds and banks of streams along the route to the extent possible. If necessary, a Streambed Alteration Agreement (SAA) will be secured from the California Department of Fish and Game (CDFG). Impacts will be mitigated based on the terms of the SAA. No streams with flowing waters capable of supporting special status species will be expected to be impacted by the Project.
BIO-4	**Best Management Practices.** Crews will be directed to use Best Management Practices (BMP) where applicable. These measures will be identified prior to construction and incorporated into the construction operations.
BIO-5	**Biological monitors.** Biological monitors will be assigned to the Project in areas of sensitive biological resources. The monitors will be responsible for ensuring that impacts to special status species, native vegetation, wildlife habitat, or unique resources will be avoided to the fullest extent possible. Where appropriate, monitors will flag the boundaries of areas where activities need to be restricted in order to protect native plants and wildlife or special status species. Those restricted areas will be monitored to ensure their protection during construction
BIO-6	**Worker Environmental Awareness Program (see CR-2b, PALEO-3, W-11).** A Worker Environmental Awareness Program (WEAP) will be prepared. All construction crews and contractors will be required to participate in WEAP training prior to starting work on the Project. The WEAP training will include a review of the special status species and other sensitive resources that could exist in the Project area, the locations of sensitive biological resources and their legal status and protections, and measures to be implemented for avoidance of these sensitive resources. A record of all trained personnel will be maintained.

TABLE 4-1 APPLICANT PROPOSED MEASURES	
APM No.	**Eldorado – Ivanpah Transmission Project APM Description**
BIO-7	**Avoid impacts to active nests.** SCE will conduct Project-wide raptor and nesting bird surveys and remove trees or other vegetation, if necessary, outside of the nesting season (nesting season in the Project area is late February to early July). If vegetation or existing structures containing a raptor nest or other active nest must be removed during nesting season, or if work is scheduled to take place in close proximity to an active nest on an existing transmission or subtransmission tower or pole, SCE will coordinate with the U.S. Fish and Wildlife Service (USFWS), CDFG, and/or the Nevada Department of Wildlife (NDOW) as appropriate to obtain written verification prior to moving the nest.
BIO-8	**Avian Protection.** All transmission and subtransmission towers and poles will be designed to be avian-safe in accordance with the Suggested Practices for Avian Protection on Power Lines: the State of the Art in 2006 (Avian Power Line Interaction Committee 2006).
BIO-9	**Facility Siting.** Final tower and spur road locations will be adjusted to avoid sensitive biological resources to the greatest extent feasible.
BIO-10	**Invasive Plant Management.** An invasive plant management plan will be developed to reduce the potential for spreading invasive plant species during construction activities.
CULTURAL RESOURCES	
CR-1	Conduct an intensive archaeological inventory of all areas that may be disturbed during construction and operation of the Project. A complete cultural resource inventory of the Project area has been conducted, details of which are contained in a technical report. Should the Project substantially change and areas not previously inventoried for cultural resources become part of the construction plan, SCE shall ensure that such additional areas are inventoried for cultural resources prior to any disturbance. All surveys shall be conducted and documented as per applicable laws, regulations, and guidelines and in accordance with professional standards.
CR-2	Avoid and minimize impacts to significant or potentially significant cultural resources wherever feasible. To the extent practical, SCE shall avoid or minimize impacts to archaeological resources, regardless of its California Register of Historic Places (CRHR) or National Register of Historic Places (NRHP) eligibility status. This includes siting all ground-disturbing activities defined in Section 4.5.4.1 and other Project components outside a buffer zone established around each recorded archaeological site within or immediately adjacent to the ROW.
CR-2a	Project Final Design shall avoid direct impacts to significant or potentially significant cultural resources. To the extent practical, all ground-disturbing activities defined in Section 4.5.4.1 and other Project components shall be sited to avoid or minimize impacts to cultural resources listed as or potentially eligible for listing as, unique archaeological sites, historical resources, or historic properties.
CR-2b	Conduct a pre-construction WEAP (see BIO-6, PALEO-3, and W-11). The WEAP will be provided for all Proposed Project personnel who have the potential to encounter and alter unique archaeological sites, historical resources, or historic properties, or properties that may be eligible for listing in the CRHR or NRHP. This includes construction supervisors as well as field construction personnel. No construction worker will be involved in ground-disturbing activities without having participated in the Worker Education Program.
CR-2c	Establish and maintain a protective buffer zone around each recorded archaeological site within or immediately adjacent to the ROW. A protective buffer zone will be established around each recorded archaeological site and treated as an “environmentally sensitive area” within which construction activities and personnel are not permitted. Monitoring will be conducted to ensure that the protective areas are maintained.
CR-3	Evaluate the significance of all cultural resources that cannot be avoided. Cultural resources that cannot be avoided and which have not been evaluated to determine their eligibility for listing in the CRHR or NRHP will be evaluated to determine their historical significance. Evaluation studies shall be conducted and documented as per applicable laws, regulations, and guidelines and in accordance with professional standards.
CR-3a	Evaluate the significance of archaeological resources potentially eligible for CRHR or NRHP listing. Evaluation of archaeological sites would include scientific excavation of a sample of site constituents sufficient to understand the potential of a site to yield information to address important scientific research questions per CRHR eligibility Criterion 4 and NRHP eligibility Criterion D. Sites with rock art will be evaluated to consider their eligibility per CRHR Criterion 1, and NRHP Criterion A or C.

APM No.	TABLE 4-1 APPLICANT PROPOSED MEASURES Eldorado – Ivanpah Transmission Project APM Description
CR-3b	Evaluate the significance of buildings and structures potentially eligible for CRHR or NRHP listing. Evaluation of buildings and structures would take into account engineering, aesthetic, architectural, and other relevant attributes of each property. Buildings and structures will be evaluated for historical significance per CRHR eligibility Criteria 1, 2, and 3, and NRHP Criteria A, B, and C. A report of the evaluation of each building or structure will be prepared providing a rationale for an assessment of significance consistent with professional standards and guidelines. Reports of significance evaluations of buildings and structures will be filed with the appropriate Information Center of the California Historical Resources Information System.
CR3c	If necessary, SCE will assist BLM in consultations with Native Americans regarding traditional cultural values that may be associated with archaeological resources. Archaeological or other cultural resources associated with the Project may have cultural values ascribed to them by Native Americans. SCE will assist the BLM during consultation with Native Americans regarding evaluations of resources with Native American cultural remains.
CR-4	Minimize unavoidable impacts to significant cultural resources, including Unique Archaeological Sites, Historical Resources, and Historic Properties. SCE will make reasonable efforts to avoid adverse Project effects to unique archaeological sites, historical resources, and historic properties. Nevertheless, it may not be possible to situate all Proposed Project facilities to completely avoid impacts to significant cultural resources. Impacts to significant cultural resources will be minimized by implementing the measures listed in APM CR-4a.
CR-4a	Implement measures to minimize impacts to significant archaeological sites. Prior to construction and during construction, the following measures will be implemented by SCE to minimize unavoidable impacts to significant archaeological sites. ■ To the extent practical, all activities shall minimize ground surface disturbance within the bounds of unique archaeological sites, historical resources, or historic properties. ■ Portions of significant archaeological sites, historical resources, or historic properties that can be avoided will be protected as environmentally sensitive areas and will remain undisturbed by construction activities. ■ Monitoring by qualified professionals and/or Native Americans to ensure that impacts to sites are minimized will be carried out at each affected cultural resource for the period during which construction activities pose a potential threat to the site, and for as long as there is the potential to encounter unanticipated cultural or human remains. ■ Additional archaeological studies will be carried out at appropriate sites to ascertain if Project facilities could be located on a portion of a site and cause the least amount of disturbance to significant cultural materials. ■ If impacts to significant archaeological (NRHP- or CRHR-eligible) sites cannot be avoided, archaeological data recovery will be carried out in the portions of affected significant sites that will be impacted. A data recovery plan will be prepared, reviewed by the appropriate agencies, and then implemented in order to recover an adequate sample of cultural remains that can be used to address important research questions per CRHR eligibility Criterion 4 or NRHP Criterion D. Archaeological data recovery will involve scientific excavations; identification of recovered cultural and ecological remains; cataloging, scientific analysis, and interpretation of recovered materials; and preparation of a scientific technical report that describes the methods and results of the data recovery program. ■ Reports of any excavations at archaeological sites will be filed with the appropriate Information Center of the California Historical Resources Information System.
CR-4b	Implement measures to minimize impacts to significant buildings and structures. Prior to construction and during construction, SCE will implement the following measures to minimize unavoidable impacts to significant buildings and structures: ■ Locate Proposed Project facilities to minimize effects on significant buildings or structures. ■ If impacts to significant buildings or structures cannot be avoided, document significant architectural and engineering attributes consistent with National Park Service Historic American Buildings Survey/Historic American Engineering Record documentation standards. ■ File reports and other documentation with the National Park Service, if appropriate, and appropriate Information Center of the California Historical Resources Information System.

TABLE 4-1 APPLICANT PROPOSED MEASURES	
APM No.	**Eldorado – Ivanpah Transmission Project APM Description**
CR-5	Prepare and Implement a Construction Monitoring and Unanticipated Cultural Resources Discovery Plan. During construction it is possible that previously unknown archaeological or other cultural resources or human remains could be discovered. Prior to construction SCE will prepare a *Construction Monitoring and Unanticipated Cultural Resources Discovery Plan* to be implemented if an unanticipated discovery is made. At a minimum the plan shall detail the following elements: ■ Worker and supervisor training in the identification of cultural remains that could be found in the Proposed Project area ■ Worker and Supervisor response procedures to be followed in the event of an unanticipated discovery, including appropriate points of contact for professionals qualified to make decisions regarding the potential significance of any find ■ Identification of persons authorized to stop or redirect work that could affect the discovery and their on-call contact information ■ Provide for monitoring of construction activities in archaeologically sensitive areas ■ Stipulate a minimum radius around any discovery within which work will be halted until the significance of the resource has been evaluated and mitigation implemented as appropriate ■ Procedures for identifying and evaluating the historical significance of any find ■ Procedures for consulting Native Americans in the process of identification and evaluation of significance of discoveries involving Native American cultural materials ■ Procedures to be followed for the treatment of discovered human remains per current state law and protocol developed in consultation with Native Americans
CR-6	Inadvertent Discovery of Human Remains. Any human remains discovered during Project activities in California will be protected in accordance with current state law, specifically Section 7050.5 of the California Health and Safety Code, Section 5097.98 of the California Public Resources Code, and Assembly Bill 2641. If human remains determined not to be Native American are unclaimed they will be treated under the appropriate State of Nevada statutes, including, but not limited to, NRS Chapter 440 (Vital Statistics) and, as appropriate, to the regulations of the applicable land managing agency. In the event that human remains are recovered on private lands, that landholder will have the right to designate the applicable repository for the remains if they are determined not to be Native American or if their family affiliation cannot be determined. The provisions of the Native American Grave Protection and Repatriation Act (NAGPRA) are applicable when Native American human remains are found on federal land (BLM land in California and Nevada). The discovery of human remains will be treated as defined in the *Construction Monitoring and Unanticipated Cultural Resources Discovery Plan*.
CR-7	Native American Participation. Prior to construction BLM will consult with Native Americans identified by the Native American Heritage Commission (NAHC) as having cultural ties to particular areas of the Proposed Project. Native Americans will be consulted regarding their participation during significance evaluations and data recovery excavations at archaeological sites with Native American cultural remains, and monitoring during Project construction. Native Americans will be consulted to develop a protocol for working with each group should human remains affiliated with that group be encountered during Project activities.
PALEONTOLOGY RESOURCES	
PALEO-1	Retention of Paleontologist. Prior to construction, a certified paleontologist would be retained by SCE to supervise monitoring of construction excavations and to produce a Paleontological Resource Management Plan (PRMP) for the Proposed Project. This PRMP would be prepared and implemented under the direction of the paleontologist and would address and incorporate the PALEO-2 through PALEO-8. Paleontological monitoring would include inspection of exposed rock units and microscopic examination of matrix to determine if fossils are present. The monitor would have authority to temporarily divert grading away from exposed fossils in order to recover the fossil specimens. More specific guidelines for paleontological resource monitoring can be found in the PRMP.
PALEO-2	Conduct a Pre-construction Paleontological Field Survey. The paleontologist and/or his designated representative will conduct a pre-construction field survey of the Project area underlain by Tertiary rock units and older alluvium. Results of the field inventory and associated recommendations would be incorporated into the PRMP.

TABLE 4-1 APPLICANT PROPOSED MEASURES	
APM No.	**Eldorado – Ivanpah Transmission Project** **APM Description**
PALEO-3	WEAP Training (see BIO-6, CR-2b, W-11). WEAP training would be provided to construction supervisors and crew for awareness of requirements regarding the protection of paleontological resources and procedures to be implemented in the event fossil remains are encountered by ground-disturbing activities.
PALEO-4	Construction Monitoring. Ground-disturbing activities would be monitored on a part-time or full-time basis by a paleontological construction monitor only in those parts of the Project area where these activities will disturb previously undisturbed strata in rock units of moderate and high sensitivity. Quaternary Alluvium, colluvium, and Quaternary Landslide Deposits have a low paleontological sensitivity level and would be spot-checked on a periodic basis to ensure that older underlying sediments are not being penetrated. Monitoring would not be implemented in areas underlain by younger alluvium unless these activities have reached a depth 5 feet below the present ground surface and fine grained strata are present. Ground-disturbing activities in areas underlain by rock units of low sensitivity would be monitored on a quarter-time basis or spot checked if fine grained strata are present.
PALEO-5	Recovery and Testing. If fossils are encountered during construction, construction activities would be temporarily diverted from the discovery and the monitor would notify all concerned parties and collect matrix for testing and processing as directed by the Project Paleontologist. In order to expedite removal of fossil-bearing matrix, the monitor may request heavy machinery to assist in moving large quantities of matrix out of the path of construction to designated stockpile areas. Construction would resume at the discovery location once the all necessary matrix was stockpiled, as determined by the paleontological monitor. Testing of stockpiles would consist of screen washing small samples to determine if important fossils are present. If such fossils were present, the additional matrix from the stockpiles would be water screened to ensure recovery of a scientifically significant sample. Samples collected would be limited to a maximum of 6,000 pounds per locality.
PALEO-6	Prepare Monthly Progress Reports. The Project Paleontologist would document interim results of the construction monitoring program with monthly progress reports. Additionally, at each fossil locality, field data forms would record the locality, stratigraphic columns would be measured, and appropriate scientific samples submitted for analysis.
PALEO-7	Analysis and Prepare Final Paleontological Resource Recovery Report. The Project Paleontologist would direct identification, laboratory processing, cataloguing, analysis, and documentation of the fossil collections. When appropriate, and in consultation with SCE, splits of rock or sediment samples would be submitted to commercial laboratories for microfossil, pollen, or radiometric dating analysis. After analysis, the collections would be prepared for curation (see APM PALEO-8). A final technical report would be prepared to summarize construction monitoring and present the results of the fossil recovery program. The report would be prepared in accordance with SCE, Society of Vertebrate Paleontology guidelines, and lead agency requirements. The final report would be submitted to SCE, the lead agency, and the curation repository.
PALEO-8	Curation. Prior to construction, SCE would enter into a formal agreement with a recognized museum repository and would curate the fossil collections, appropriate field and laboratory documentation, and the final Paleontological Resource Recovery Report in a timely manner following construction.
GEOLOGICAL RESOURCES	
GEO-1	Prior to final design of substation facilities, and transmission and subtransmission line tower foundations, a combined geotechnical engineering and engineering geology study would be conducted to identify site-specific geologic conditions and potential geologic hazards in sufficient detail to support sound engineering practices.
GEO-2	For new substation construction, specific requirements for seismic design would be followed based on the IEEEs' 693 "Recommended Practices for Seismic Design of Substations," which includes probabilistic earthquake hazard analysis. Other Project elements would be designed and constructed in accordance with the appropriate industry standards, as well as good engineering and construction practices and methods.
GEO-3	Transmission line and substation construction activities would be conducted in accordance with the soil erosion/water quality protection measures to be specified in the Project Construction SWPPP. New access roads would be designed to minimize ground disturbance from grading. They will follow natural ground contours as closely as possible, and include specific features for road drainage. Measures could include water bars, drainage dips, side ditches, slope drains, and velocity reducers. Where temporary

TABLE 4-1 APPLICANT PROPOSED MEASURES	
APM No.	**Eldorado – Ivanpah Transmission Project APM Description**
	crossings are constructed, the crossings will be restored and repaired as soon as possible after completion of the discrete action associated with construction of the line in the area.
HAZARDOUS MATERIALS	
HAZ-1	**Phase I Environmental Site Assessment.** A Phase I Environmental Site Assessment would be performed at each new or expanded substation location and along newly acquired transmission subtransmission line ROWs. The Phase I Environmental Site Assessments would include an electronic records search of federal, state, and local databases. The electronic records search would be contracted to a company which specializes in this type of work and who would produce a comprehensive report for the new or expanded ROW. The comprehensive report is used to identify sites located on federal, state, and local government agency databases which may have the potential to impact the Proposed Project; it would be reviewed and, based on such review, any potential areas of concern along the ROW would be identified for further assessment. In addition, a Phase I Environmental Site Assessment which is compliant with American Society for Testing Materials (ASTM) 1927-05 (ASTM 2005), would be performed on all property to be acquired. Based on the results of the Phase I Environmental Site Assessment, additional assessment, characterization, and remediation of potential or known subsurface impacts may be conducted prior to construction activities. Such remediation could include the relocation of transmission line structures as necessary to avoid impacted areas, or the removal and disposal of impacted soils and/or groundwater according to applicable regulations.
HAZ-2	**Hazardous Materials and Waste Handling Management.** Hazardous materials used and stored on-site for the proposed construction activities, as well as hazardous wastes generated on-site as a result of the proposed construction activities, would be managed according to the specifications outlined below as follows: ■ **Hazardous Materials and Hazardous Waste Handling Program:** A Project-specific hazardous materials management and hazardous waste management program would be developed prior to initiation of the Project. The program would outline proper hazardous materials use, storage and disposal requirements, as well as hazardous waste management procedures. The program would identify types of hazardous materials to be used during the Project and the types of wastes that would be generated. All Project personnel would be provided with Project-specific training. This program would be developed to ensure that all hazardous materials and wastes were handled in a safe and environmentally sound manner. Hazardous wastes would be handled and disposed of according to applicable rules and regulations. Employees handling wastes would receive hazardous materials training and shall be trained in: hazardous waste procedures; spill contingencies; waste minimization procedures; and treatment, storage, and disposal facility (TSDF) training in accordance with Occupational Safety and Health Administration (OSHA) Hazard Communication Standard and 22 California Code of Regulations (CCR). SCE would use landfill facilities that are authorized to accept treated wood pole waste in accordance with HSC 25143.1.4(b). ■ **Construction Stormwater Pollution Prevention Plan:** A Project-specific construction SWPPP would be prepared and implemented prior to the start of construction of the transmission line and substations. The SWPPP would use BMPs to address the storage and handling of hazardous materials and sediment runoff during construction activities (California Stormwater Quality Association 2004). ■ **Transport of Hazardous Materials:** Hazardous materials that would be transported by truck include fuel (diesel fuel and gasoline), and oil and lubricants for equipment. Containers used to store hazardous materials would be properly labeled and kept in good condition. Written procedures for the transport of hazardous materials used would be established in accordance with U.S. Department of Transportation (USDOT), California Department of Transportation (CalTrans), and Nevada Department of Transportation (NDOT) regulations. A qualified transporter would be selected to comply with federal and state transportation regulations.

TABLE 4-1 APPLICANT PROPOSED MEASURES	
APM No.	**Eldorado – Ivanpah Transmission Project APM Description**
	■ **Fueling and Maintenance of Construction Equipment:** Written procedures for fueling and maintenance of construction equipment would be prepared prior to construction. Vehicles and equipment would be refueled on-site or by tanker trucks. Procedures would include the use of drop cloths made of plastic, drip pans, and trays to be placed under refilling areas to ensure that chemicals do not come into contact with the ground. Refueling stations would be located in designated areas where absorbent pads and trays would be available. The fuel tanks would also contain a lined area to ensure that accidental spillage does not occur. Drip pans or other collection devices would be placed under the equipment at night to capture drips or spills. Equipment would be inspected daily for potential leakage or failures. Hazardous materials such as paints, solvents, and penetrants would be kept in an approved locker or storage cabinet. ■ **Fueling and Maintenance of Helicopters:** Written procedures for fueling and maintenance of helicopters would be prepared prior to construction. Helicopters would be refueled at helicopter staging areas or local airports. Procedures would include the use of drop cloths made of plastic, drip pans, and trays to be placed under refilling areas to ensure that chemicals do not come into contact with the ground. Refueling areas would be located in designated areas where absorbent pads and trays are available. ■ **Emergency Release Response Procedures:** An Emergency Response Plan detailing responses to releases of hazardous materials would be developed prior to construction activities. It would prescribe hazardous materials handling procedures for reducing the potential for a spill during construction, and would include an emergency response program to ensure quick and safe cleanup of accidental spills. All hazardous materials spills or threatened release, including petroleum products such as gasoline, diesel, and hydraulic fluid, regardless of the quantity spilled, would be immediately reported if the spill has entered a navigable water, stream, lake, wetland, or storm drain if the spill impacted any sensitive area, including conservation areas and wildlife preserved, or if the spill causes injury to a person or threatens injury to public health. All construction personnel, including environmental monitors, would be aware of state and federal emergency response reporting guidelines.
HAZ-3	**Soil Management Plan.** A Soil Management Plan would be developed and implemented for construction of the Proposed Project. The objective of the Soil Management Plan is to provide guidance for the proper handling, on-site management, and disposal of impacted soil that might be encountered during construction activities. The plan would include practices that are consistent with the California Title 8, OSHA regulations, as well as appropriate remediation standards that are protective of the planned use. Appropriately trained professionals would be on-site during preparation, grading, and related earthwork activities to monitor soil conditions encountered. The Soil Management Plan would provide guidelines for the following: ■ Identifying impacted soil ■ Assessing impacted soil ■ Soil excavation ■ Impacted soil storage ■ Verification sampling ■ Impacted soil characterization and disposal In the event that potentially contaminated soils were encountered within the footprint of construction, soils would be tested and stockpiled. In California, the California Unified Program Agency (CUPA) would determine whether further assessment is warranted. In Nevada, the Nevada Department of Environmental Protection (NDEP) Bureau of Corrective Actions (BCA) Spill Hotline (888-331-6337) would be contacted if the quantity of impacted material is greater than 3 cubic yards.
HAZ-4	**Fire Management Plan.** The Fire Management Plan developed by SCE and presented in this PEA as Appendix K would be implemented.

TABLE 4-1 APPLICANT PROPOSED MEASURES	
APM No.	**Eldorado – Ivanpah Transmission Project APM Description**
HAZ-5	**Spill Prevention, Countermeasure, and Control Plan and Hazardous Materials Business Plan.** ■ **Spill Prevention, Countermeasure, and Control Plan.** In accordance with Title 40 of the CFR, Part 112, SCE would prepare a SPCC Plan for proposed and/or expanded substations. The plans would include engineered and operational methods for preventing, containing, and controlling potential releases, and provisions for quick and safe cleanup. ■ **Hazardous Materials Business Plans.** Prior to operation of new or expanded substations, SCE would prepare or update and submit, in accordance with Chapter 6.95 of the California Health and Safety Department (CHSD), and Title 22 CCR, a Hazardous Materials Business Plan (HMBP). The required documentation would be submitted to the designated CUPA in California. (An HMBP or similar documentation is not required by the state of Nevada.) The HMBPs would include hazardous materials and hazardous waste management procedures, and emergency response procedures including emergency spill cleanup supplies and equipment.
HYDROLOGY AND WATER QUALITY	
W-1	Construction equipment will be kept out of flowing stream channels except when absolutely necessary to construct crossings.
W-2	Erosion control and hazardous material plans will be incorporated into the construction bidding specifications to ensure compliance.
W-3	Appropriate design of tower footing foundations, such as raised foundations and/or enclosing flood control dikes, will be used to prevent scour and/or inundation by a 100-year flood. Where floodplain encroachment is required by the CPUC and/or the BLM, and potential impacts require non-standard designs, hydrology/channel flow analysis would be performed.
W-4	Towers will be located to avoid active drainage channels, especially downstream of steep hillslope areas, to minimize the potential for damage by flash flooding and mud and debris flows.
W-5	Diversion dikes will be required to divert runoff around a tower structure or a substation site if (a) the location in an active channel (or channels) cannot be avoided; and (b) where there is a very significant flood scour/deposition threat, unless such diversion is specifically exempted by the CPUC and/or the BLM Authorized Officer.
W-6	Runoff from roadways will be collected and diverted from steep, disturbed, or otherwise unstable slopes.
W-7	Ditches and drainage devices will be designed to handle the concentrated runoff, will be located to avoid disturbed areas, and will have energy dissipations at discharge points. These may include rip-rap, concrete aprons, stepped spillways, etc. Where diversion dikes are required to protect towers or other Project structures from flooding or erosion, these dikes would be designed to avoid increasing the risk of erosion or flooding onto adjacent property.
W-8	Cut and fill slopes will be minimized by a combination of benching and following natural topography where possible.
W-9	Prepare and implement an approved SWPPP. As a part of the SWPPP, soil disturbance at tower construction sites and access roads shall be the minimum necessary for construction and designed to prevent long-term erosion through the following activities: restoration of disturbed soil, re-vegetation, and/or construction of permanent erosion control structures. Implement BMPs in the project SWPPP during construction to minimize the risk of an accidental release.
W-10	The Emergency Release Response Procedures developed pursuant to APM Haz-1 would be maintained on-site (or in vehicles) during construction of the Project.
W-11	Conduct a WEAP (see BIO-6, CR-2b, PALEO-3). to communicate environmental concerns and appropriate work practices, including spill prevention, emergency response measures, and proper BMP implementation, to all field personnel prior to the start of construction. This training program will emphasize site-specific physical conditions to improve hazard prevention. It will include a review of all site-specific plans, including but not limited to the Project's SWPPP and Hazardous Substances Control and Emergency Response Plan. SCE will document compliance and maintain a list of names of all construction personnel who have completed the training program.

TABLE 4-1 APPLICANT PROPOSED MEASURES	
APM No.	**Eldorado – Ivanpah Transmission Project APM Description**
W-12	All construction and demolition waste, including trash and litter, garbage, and other solid waste, shall be removed and transported to an appropriately permitted disposal facility. Petroleum products and other potentially hazardous materials shall be removed and transported to a hazardous waste facility permitted or otherwise authorized to treat, store, or dispose of such materials.
W-13	Prior to excavation, SCE or its contractors will locate overhead and underground utility lines, such as natural gas, electricity, sewage, telephone, fuel, and water lines, or other underground structures that may reasonably be expected to be encountered during excavation work.
W-14	Prepare or update SPCC Plans for substations to minimize, avoid, and/or clean up unforeseen spill of hazardous materials during facility operations.
LAND USE AND PLANNING	
LU-1	**Aeronautical Considerations.** SCE would submit notice to the Federal Aviation Administration (FAA) electronically, in accordance with FAA procedures, and as far in advance of construction as possible.
NOISE	
NOI-1	**Compliance with Local Noise Ordinances.** The proposed construction would comply with local noise ordinances. There may be a need to work outside the aforementioned local ordinances in order to take advantage of low electrical draw periods during the nighttime hours. SCE would comply with variance procedures requested by local authorities if required.
NOI-2	**Construction Equipment Working Order.** Construction equipment would be in good working order.
NOI-3	**Construction Equipment Maintenance.** Construction equipment would be maintained per manufacturer's recommendations.
NOI-4	**Construction Equipment Muffled**. Construction equipment would be adequately muffled.
NOI-5	**Construction Equipment Idling Minimized.** Idling of construction equipment and vehicles would be minimized during the construction.
NOI-6	**Hearing Projection for Workers.** Workers would be provided appropriate hearing protection, if necessary, as described in the Health and Safety Plan.
RECREATION	
REC-1	**Recreation Area Closures.** When temporary short-term closures to recreational areas are necessary for construction activities, SCE would coordinate those closures with recreational facility owners. To the extent practicable, SCE would schedule construction activities to avoid heavy recreational use periods (e.g., holidays or tournaments). SCE would post notice of the closure on-site 14 calendar days prior to the closure.
TRANSPORTATION AND TRAFFIC	
TRA-1	**Obtain Permits.** If any work requires modifications or activities within local roadway and railroad ROWs, appropriate permits will be obtained prior to the commencement of construction activities, including any necessary local permits and encroachment permits.
TRA-2	**Traffic Management and Control Plans.** Traffic control and other management plans will be prepared where necessary to minimize Project impacts on local streets and railroad operations.
TRA-3	**Minimize Street Use.** Construction activities will be designed to minimize work on, or use of, local streets.
UTILITIES AND SERVICE SYSTEMS	
PUSVC-1	**Work Around High Pressure Pipelines**. No mechanical equipment will be permitted to operate within 3 feet of the high-pressure pipelines, and work within 3 feet must be done by hand or as otherwise directed by the pipeline company.
PUSVC-2	**Monitoring by Pipeline Companies**. A representative of applicable owners and operators of major pipeline companies must observe the excavation around or near their facilities to ensure protection and to record pertinent data necessary for operations.

4.1 AESTHETIC RESOURCES

Aesthetic or visual resources are the natural and cultural features of the landscape that can be seen and contribute to the public's enjoyment of the environment. Impacts on visual or aesthetic resources are generally defined in terms of a project's physical characteristics, potential visibility, and the extent to which a project's presence would change the perceived visual character and quality of the environment in which it would be located.

The Proposed Project, which is described in detail in Chapter 3 of this PEA, would include replacement of an approximately 35-mile 115kV transmission line with a new 220kV transmission line, expansion of the Eldorado Substation, construction of the Proposed Ivanpah Substation, and installation of a redundant Telecommunication System.

In response to the NEPA and CEQA requirements for assessment of a proposed project's aesthetic impacts, a systematic evaluation was made of the visual conditions that now exist in the areas in which the Proposed Project's elements would be located, and of the implications that the Proposed Project would have on the public's experience of the region's aesthetic qualities.

In this section, a discussion is presented of the methodology followed in preparing the evaluation of impacts to aesthetic or visual resources. The regulations, plans, and standards applicable to the visual resources in the Proposed Project area are noted, and the criteria are presented to determine whether the Proposed Project's impacts on visual resources would be adverse under NEPA or significant under CEQA. Section 4.1.2.2 of this section summarizes the APMs that SCE would integrate into the siting and design of the Proposed Project, and the plans for construction that would help to visually integrate the Proposed Project into its landscape setting and reduce the potential for significant or adverse aesthetic effects.

4.1.1 Regulatory Setting

4.1.1.1 Federal

NEPA requires the federal government to use all practicable means to ensure all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). Additionally, under Federal Land Policy Management Act (FLPMA), Federal land management agencies are required to acknowledge local plans and participation. Title 43, U.S.C.A. §1712(c)(9) states:

> [The Secretary shall] to the extent consistent with the laws governing the administration of the public [Federal] lands, coordinate the land use inventory, planning, and management activities of or for such lands with the land use planning and management programs of other Federal departments and agencies and of the States and local governments within which the lands are located.... In implementing this directive, the Secretary shall, to the extent he finds practical, keep apprised of State, local and tribal land use plans; assure that consideration is given to those State, local and tribal plans that are germane to the development of land use plans for public [Federal] lands, assist in resolving to the extent practical, inconsistencies between Federal and non-Federal

> Government plans, and shall provide for meaningful public involvement of State and local government officials...in the development of land use programs, land use regulations, and land use decisions for public [Federal] lands.... Land use plans of the Secretary under this section shall be consistent with the State and local plans to the maximum extent he finds consistent with Federal law and the purposes of this Act.

In response to FLPMA, the California Desert Conservation Area (CDCA) Plan and the Las Vegas Resource Management Plan (RMP)/Final EIS were developed. The CDCA Plan acts as the BLM's land use guide for the management of public lands and resources within the CDCA. The Proposed Project crosses lands managed by the BLM under the CDCA Plan as Class L and Class M according to the CDCA Map 1 Land Use Plan 1999 (BLM 1999).

> Multiple-Use Class L (Limited Use) protects sensitive, natural, scenic, ecological, and cultural resource values. Public lands designated as Class L are managed to provide for generally lower-intensity, carefully controlled multiple use of resources, while ensuring that sensitive values are not significantly diminished.
>
> Multiple-Use Class M (Moderate Use) is based upon a controlled balance between higher intensity use and protection of public lands. This class provides for a wide variety or present and future uses such as mining, livestock grazing, recreation, energy, and utility development. Class M management is also designed to conserve desert resources and to mitigate damage to those resources which permitted uses may cause.

The Las Vegas RMP acts as the BLM's Visual Resource Management (VRM) guide to manage visual and aesthetic impacts on BLM lands in the Las Vegas District in Nevada. The Proposed Project crosses lands managed by the BLM under the Las Vegas RMP as VRM Class II and VRM Class III (BLM 1998). These VRM classes are discussed under Section 4.1.2.3 of this document.

National Historic Preservation Act

The federal law that deals with cultural resources that could be affected by federal undertakings is the National Historic Preservation Act (NHPA) of 1966, as amended. Cultural resources listed in or eligible for the NRHP that could be visually impacted by the Proposed Project are discussed under the Cultural and Paleontological Resources section of this PEA.

Department of Interior, Bureau of Land Management

The Proposed Project will require approval from the BLM. The BLM will evaluate the Proposed Project's visual effects under NEPA.

NEPA requires the following:

> Federal agencies to include in their decision-making processes appropriate and careful consideration of all environmental effects of proposed actions, analyze potential

environmental effects of proposed actions and their alternatives for public understanding and scrutiny, avoid or minimize adverse effects of proposed actions, and restore and enhance environmental quality as much as possible. (CFR Title 40 Part 6)

4.1.1.2 State

California Public Utilities Commission

The Proposed Project will also require approval from the CPUC. The CPUC will evaluate the Proposed Project's visual impacts in light of the requirements of the CEQA. The CPUC will evaluate these impacts for both the California and Nevada sides of the Project.

The CEQA Guidelines define a "significant effect" on the environment to mean a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including… objects of historic or aesthetic significance" (CCR, Title 14 §15382). Appendix G of the CEQA Guidelines identifies the criteria that must be considered when analyzing a project's potential to result in temporary and permanent impacts on aesthetics.

The CPUC GO No. 131-D, Section XIV B clarifies that "local jurisdictions acting pursuant to local authority are preempted from regulating electric power line projects, distribution lines, substations, or electric facilities constructed by public utilities subject to the Commission's jurisdiction. However, in locating such projects, the public utilities shall consult with local agencies regarding land use matters." Due to this GO, the public utilities are directed to consider local regulations and consult with local agencies; however, the county and cities do not have jurisdiction over the Proposed Project in California.

Public Utilities Commission of Nevada

The Proposed Project will also require approval from the Public Utilities Commission of Nevada (PUCN). The construction of a utility facility, defined as a transmission line that is 200kV or more, requires a permit by the PUCN under the Utility Environmental Protection Act (UEPA) according to the Nevada Revised Statutes (NRS) 704.820 through 704.900. However, the replacement of an existing facility with a like facility, as determined by the Commission, does not constitute construction of a utility facility (NRS 704.865) (Nevada State Legislature [NSL] 2009).

4.1.1.3 Local

Although the Proposed Project is exempt from local land use and zoning regulations and permitting in California under GO No. 131-D, SCE intends to develop facility designs that are compatible with local plans and zoning to the extent practicable. Therefore, Table 4-2 summarizes elements of local land use documents that have applicability to aesthetics and visual resources.

TABLE 4-2 LOCAL LAND USE DOCUMENTS APPLICABLE TO VISUAL RESOURCES
San Bernardino County General Plan
Conservation Element
Countywide Goal CO 8. The County will minimize energy consumption and promote safe energy extraction, uses, and systems to benefit local regional and global environmental goals. Policy CO 8.1 Maximize the beneficial effects and minimize the adverse effects associated with the siting of major energy facilities. The County will site energy facilities equitably in order to minimize net energy use and consumption of natural resources, and avoid inappropriately burdening certain communities. Energy planning should conserve energy and reduce peak load demands, reduce natural resource consumption, minimize environmental impacts, and treat local communities fairly in providing energy efficiency programs and locating energy facilities. **Programs** 3. Require undergrounding of new and existing transmission lines when feasible. 4. Assist in the development and use of new designs for major transmission line towers that are aesthetically compatible with the environment from a close viewing distance. 8. The County shall consult with electric utilities during the planning construction of their major transmission lines towers to ensure that they are aesthetically compatible with the surrounding environment.
Desert Region Goal D/CO 3. Preserve the dark night sky as a natural resource in the Desert Region communities. Policy D/CO 3.1 Protect the Night Sky by providing information about and enforcing existing ordinances: b. Review exterior lighting as part of the design review process. Policy D/CO 3.2 All outdoor lighting, including street lighting, shall be provided in accordance with the Night Sky Protection Ordinance and shall only be provided as necessary to meet safety standards.
GOAL OS 5. The County will maintain and enhance the visual character of scenic routes in the County. Policy OS 5.3 The County desires to retain the scenic character of visually important roadways throughout the County. A scenic route is a roadway that has scenic vistas and other scenic and aesthetic qualities that over time have been found to add beauty to the County. Therefore, the County designates the following routes as scenic highways and applies all applicable policies to development on these routes. MULTIPLE REGIONS: c. I-15 from the junction with I-215 northeast to the Nevada state line, excepting those areas within the Barstow Planning Area and the community of Baker where there is commercial/industrial development; those portions within the Yermo area from Ghost Town Road to the East Yermo Road overcrossing on the south side only, and from First Street to the East Yermo Road overcrossing on the north side; and all incorporated areas.
Clark County Comprehensive Plan
Utilities
Policy UT 1-8 Support the reduction of visual impacts by newly constructed utility poles, towers, substations, and equipment buildings. Use methods for reducing the effect through actions such as: ■ Disguising and co-locating antennas for cell towers ■ Hiding equipment buildings with screening and solid fencing ■ Use architecture design on major utility projects to complement the character of a community ■ Place high capacity electrical transmission lines underground to lessen visual impacts in large multi-use projects
Boulder City Master Plan
Special Planning Area Policies – Eldorado Valley
EV 3: VIEWS The visual impacts of future development in the Eldorado Valley should be a strong consideration when reviewing future proposals for energy production facilities or other uses. Future development should be designed so as to minimize negative impacts to views of the Eldorado Valley from the urbanized areas of the city.
Sources: BLDC 2003; CLCO 2005; SBCO 2007

4.1.2 Significance Criteria and Approach to Impact Assessment

4.1.2.1 Significance Criteria

The following sections identify the criteria that will apply in determining whether any of the Proposed Project's potential impacts to visual resources would be considered potentially significant under CEQA if the Project would:

- have a substantial adverse effect on a scenic vista
- substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway
- substantially degrade the existing visual character or quality of the site and its surroundings
- create a new source of substantial light or glare that would adversely affect day or nighttime views in the area

4.1.2.2 Applicant Proposed Measures

The following visual resource-specific APMs would be incorporated into the Proposed Project.

<u>AES-1 Road Cut Rock Staining</u>. Where new roads are required in the South McCullough Mountains to access new or existing transmission and subtransmission towers, SCE would consult with the BLM regarding feasible methods to treat the exposed rock to match the overall color of the adjacent weathered rock.

<u>AES-2 Seeding and Inter-Planting.</u> Where new roads are required in the South McCullough Mountains to access new or existing transmission and subtransmission towers, road cuts would be treated by seeding and/or inter-planting into the disturbed areas to restore the area to an appearance that will blend back into the overall landscape context.

<u>AES-3 Non-Reflective Finish.</u> LST and TSP would be constructed of steel that is galvanized and treated at the factory to create a dulled finish that will reduce reflection of light off of the tower members. As appropriate to the environment, the galvanized coating would also be treated to allow the towers to blend into the backdrops. Non-specular transmission cable would be installed for the new transmission line to minimize conductor reflectivity.

<u>AES-4 Regrade/Revegetate Construction Sites.</u> Areas around new or rebuilt transmission and subtransmission structures that must be cleared during the construction process would be regraded and revegetated to restore the area to an appearance that would blend back into the overall landscape context.

<u>AES-5 Use Existing Access Roads.</u> To the extent feasible, existing access roads would be used.

<u>AES-6 Minimize Road Modifications.</u> Widening and grading of roads would be kept to the minimum required for access by Proposed Project construction equipment.

AES-7 Dust Suppression. During the construction period, dust suppression measures would be used to minimize the creation of dust clouds potentially associated with the use of the access roads.

AES-8 Substation Lighting Control. The substation lighting would be designed to be manually operated so that it can be turned on only when required for non-routine nighttime work. The lighting would be directed downward and shielded to eliminate off-site light spill at times when the lighting might be in use.

4.1.2.3 Approach to Impact Assessment

Methodology

A description of the BLM methodology, specialized tools and vocabulary, visual fieldwork, and visual resources photographs/Key Observation Point (KOP) documentation are provided below.

Bureau of Land Management Methodology

The BLM VRM system was used to analyze the eight representative KOPs discussed in this section. The VRM classification system is a "systematic process used to analyze potential visual impacts of proposed projects and activities" (BLM 2007b). BLM-managed property is assigned one of four classes based on the BLM's evaluation of the form, line, color, and texture of the existing landform/water, vegetation, and structures. The assigned class is then used to determine the potential impact resulting from the proposed activities. The classification system was developed to "provide the basis for the consideration of visual resources in the BLM's resource management planning process" (BLM 2007b). The VRM class assigned to the area is compared to the proposed development to determine what, if any, mitigation is required to meet the VRM class objectives (BLM 2007b).

The VRM classes for BLM-managed land within the area of the Proposed Project are Class II and Class III. The objective for VRM Class II is to:

> …retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape (BLM 2007b).

The objective for VRM Class III is to:

> …partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape (BLM 2007b).

The North and South McCullough Wilderness Areas, located approximately 1.3 miles to 3 miles from the Proposed Project as it runs through the McCullough Pass, are classified as VRM Class I. While the views within the wilderness areas are subject to VRM Class I objectives, the views from the wilderness areas are not (BLM 2007b). Therefore, VRM Class 1 objectives do not apply to this analysis.

For purposes of this evaluation, the BLM VRM classifications for the lands potentially affected by the Proposed Project were also applied during analysis to the adjacent non-BLM-managed land. Applying BLM VRM classifications to non-BLM-managed lands enabled the analysis to be standardized when determining the potential effect of the Proposed Project. Additionally, regional and local regulations described previously that apply to the Proposed Project were considered during analysis.

Specialized Tools and Vocabulary

The following fundamental terminology is used throughout this analysis and is defined as follows:

- Basic Elements – The four design elements (form, line, color, and texture) which determine how the character of a landscape is perceived (BLM 1985).

- Simulations – Digitally enhanced images based on photographs taken of selected views; they illustrate the probable changes due to the Project and relative scales of the existing and proposed features.

- Views – That which can be seen from the Project area and that which can be seen of the Project area from the surrounding neighborhoods and communities. Because it is not possible to depict every view toward the Project features, representative views have been selected to represent types of views that are available to the general public. The viewpoints from which these representative views are seen are called KOPs.

- Viewers – People who have views of the Project; viewers are usually discussed in terms of general categories of activities (such as residents, workers, recreationists [park users, boaters, or bicyclists], pedestrians, or motorists [both commuters and leisure travelers]) and are referred to as “viewer groups.”

- Visual Character – An impartial description of what the landscape consists of and is defined by the relationships between the existing visible natural and built landscape features.

- Viewing Distance – The distance between the viewed object and the viewer. The closer the viewer is to a viewed object, the more detail can be seen and the greater the potential influence the object has on visual quality. For this analysis, three viewing distances were used; they are (1) foreground (between 0 and approximately 0.5 mile of the viewers), (2) middleground (between 0.5 and 5 miles), and (3) background (between 5 miles and 15 miles).

- Visual Quality – An assessment of the composition of the character-defining features for selected views.

Agency Coordination

Coordination with the CPUC visual resources consultant Tom Dildine, BLM staff Mona Daniels (Needles Field Office), and BLM staff Mark Chandler (Las Vegas Field Office) occurred during and after the completion of visual field work.

Tom Dildine and Mona Daniels met with CH2M HILL visual resources specialists to conduct field work and identify potential KOPs under the jurisdiction of the Needles Field Office. Mark Chandler met with CH2M HILL visual resource specialists to conduct field work and identify potential KOPs under the jurisdiction of the Las Vegas Field Office. Coordination with agency staff continued after the completion of the visual field work to discuss potential project issues and determine the final selection of KOPs for the project.

Visual Fieldwork

CH2M HILL conducted field surveys in San Bernardino County, California, and Clark County, Nevada, on October 16, 2008. The CH2M HILL field staff included Tom Priestley, Senior Visual Resources Specialist and Brenda Eells, Visual Resources Specialist. Mr. Priestley and Ms. Eells were accompanied by Ms. Daniels from the BLM and Mr. Dildine from the CPUC. Ms. Daniels directed the visual resources specialists to potential KOP locations. During this field visit, Ms. Daniels indicated that the BLM-administered lands in the Project area that are located in San Bernardino County, California would be managed as VRM Class III.

CH2M HILL conducted additional field surveys in Clark County, Nevada on November 13 and 14, 2008. The CH2M HILL field staff included Ms. Eells and Colleen Bredensteiner, Visual Resources Specialist. On November 13, Ms. Eells and Ms. Bredensteiner were accompanied by Mr. Chandler from the BLM. Mr. Chandler directed the visual resources specialists to potential KOP locations. During and subsequent to this field visit, Mr. Chandler indicated that the BLM-administered lands in the Project area that are located in Clark County, Nevada would be managed as VRM Class III.

A subsequent map provided by Mr. Chandler indicated that there are areas in the project vicinity that will be managed as VRM Class II, and the analysis contained in this section reflects the presence of both VRM Class III and VRM Class II lands.

Visual Resources Photographs/Key Observation Point Documentation

During the field work conducted for the Proposed Project, photographs were taken from a number of potential KOP locations (Figure 4.1-1, located in Map Volume). Subsequent to the field work, the potential KOPs and associated photographs were reviewed and evaluated between the CH2M HILL visual resources specialists and agency staff to select representative views of potential Project impacts. The selection process took into consideration a number of factors, including potential viewer groups, visual character of the landscape, viewer distance to the Proposed Project, and visual quality of the views. Ultimately, a collection of eight KOPs was selected.

For the view from each of the eight KOPs, a photograph was selected to provide the basis for development of a simulation to depict the view as it would appear with the completed Project in place. The photographs used as the basis for the simulations were all taken with a digital camera set to take photographs equivalent to those taken with a 35-mm camera using a 50-mm focal length. For each KOP, single-frame images were used. For each view, computer modeling and rendering techniques were used to produce the simulated images. Existing topographic and site data provided the basis for developing an initial digital model. Project engineers provided site plans and digital data for the proposed facilities. These plans and data were used to create three-dimensional (3-D) digital models of the transmission and substation structures. These models were then combined with the digital site model to produce a complete computer model of the Proposed Project.

For each simulation viewpoint, a viewer location was digitized from topographic maps and scaled aerial photographs, using 5 feet as the assumed viewer eye level. Computer wire frame perspective plots were then overlaid on the photographs of the views from the simulation viewpoints to verify scale and viewpoint location. Digital visual simulation images were produced as a next step based on computer renderings of the 3-D model combined with high-resolution digital versions of base photographs. The final hardcopy visual simulation images that appear in this document were produced from the digital image files using a color printer.

Comparison of the “before” photographs with the simulations of the Project as it would appear after construction provided the basis for determining potential Project impacts on views and visual quality. Because landscape plans for the substation have not yet been prepared, it was not possible to include the landscaping in the simulations. As a consequence, the simulations depict the substations as they would appear immediately after construction and before landscaping has been installed.

In comparing the pre-construction and post-construction conditions, the BLM Visual Contrast Rating Worksheet Form 8400-4 (Form 8400-4) Sections A, B, and C were used to document the existing environment and the changes to the existing environment resulting from the implementation of the Proposed Project. Section D was then used to evaluate the degree of contrast between the existing environment and the changes to occur resulting from the Project design. Finally, whether the Project design met the VRM objectives set by the BLM for VRM Class II and VRM Class III was determined, and mitigation measures if applicable were determined and documented on the worksheet forms.

KOPs, including the existing environment and the simulated views, are shown in Figures 4.1-2 through 4.1-9, and 4.1-15 (located in Map Volume). Character photographs documenting additional areas of the Project vicinity are shown in Figures 4.1-10 through 4.1-14 (located at the end of Section 4.1).

Thresholds of Significance

Bureau of Land Management

The BLM Form 8400-4, Section D1 and Section D2, is used to determine if the Proposed Project falls under the BLM VRM Classification System's thresholds of significance. Section D1 is used to compare the degree of contrast between the existing environment and the changes resulting from the Proposed Project. Once the degree of contrast is determined, the ratings are compared and documented as follows:

> ...the contrast ratings are compared with the objectives for the approved VRM Class. For comparative purposes, the four levels of contrast (i.e., none, weak, moderate, and strong) roughly correspond with classes I, II, III, and IV, respectively. This means that a "strong" contrast rating may be acceptable in a class IV area but probably would not meet the VRM objectives for a class III area. In making these comparisons, one must also look at the cumulative effect of all the contrast ratings. Certain combinations of ratings may indicate there is a stronger overall contrast that the individual ratings show. For example, several "moderate" ratings when viewed in combination may warrant an overall "strong" rating. This is a judgmental call that must be documented on the back side of the form. If the rater checks the "no" block on the form, indicating the VRM objectives are not met, the reasons for not meeting the objectives must also be documented on the back of the form (BLM 2007a).

The following general criteria and factors (Table 4-3) are used when rating the degree of contrast.

TABLE 4-3
DEGREE OF CONTRAST CRITERIA

Degree of Contrast	Criteria
None	The element contrast is not visible or perceived.
Weak	The element contrast can be seen, but does not attract attention.
Moderate	The element contrast begins to attract attention and begins to dominate the characteristic landscape.
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape.
Source: BLM 2007a.	

The following represent the BLM General Guidance for Assessing Contrast (BLM 2007a):

- **Form**. Contrast in form results from changes in the shape and mass of landforms or structures. The degree of change depends on how dissimilar the introduced forms are to those continuing to exist in the landscape.
- **Line**. Contrasts in line results from changes in edge types and interruption or introduction of edges, bands, and silhouette lines. New lines may differ in their subelements (boldness, complexity, and orientation) from existing lines.
- **Color**. Changes in value and hue tend to create the greatest contrast. Other factors, such as chroma, reflectivity, and color temperature, also increase the contrast.

- **Texture**. Noticeable contrast in texture usually stems from differences in the grain, density, and internal contrast. Other factors, such as irregularity and directional patterns of texture, may affect the rating.

4.1.3 Environmental Setting

4.1.3.1 Regional Setting

The Proposed Project would be located in Nevada and California, within the Great Basin Region. The Great Basin Region consists of north-trending, fault-bounded, high mountain ranges and intervening dry, alluvial, flat-floored valleys (NASA 2007).

The Proposed Project extends from the existing Eldorado Substation located in the city of Boulder City in Clark County, Nevada, to the Proposed Ivanpah Substation located approximately 6 miles south of the California/Nevada border in unincorporated San Bernardino County, California, in the Mojave Desert (Figure 4.1-1, located in Map Volume).

The physical setting in which the Project would be located varies considerably across its 35-mile length. The Eldorado Substation is located in the Eldorado Valley east of the McCullough Mountain Range. The proposed transmission line would run from the Eldorado Substation westerly through the McCullough Mountain Range, and southwest through the Ivanpah Valley. The proposed transmission line route in the Ivanpah Valley would run east of Roach Lake, through the city of Primm, and would cross Ivanpah Lake before terminating at the Proposed Ivanpah Substation. The proposed transmission line would replace an existing transmission line located within a heavily used corridor with multiple overhead lines of varying voltage. The Proposed Ivanpah Substation site, which is primarily vegetated with grasses and low-lying scrub bushes, is located within the Ivanpah Valley.

Ivanpah Lake is bisected by the existing transmission corridor in the vicinity of Primm, Nevada. The lake covers an area of approximately 35 square miles, and is a popular place for kite buggying, land sailing, long-distance archery, and kite demonstrations. The lake area is open to non-motorized vehicle access and to motorized vehicles with a permit. Primary access to the lake is near the casinos in Primm.

Urban uses adjacent to the project include casinos in Primm, Nevada, on the east and west sides of I-15, the Desert Oasis Apartment Complex for casino employees located behind (east of) the casinos on the east side of I-15, and a power plant (Reliant's Bighorn Generating Station) on the east side of I-15. Paralleling I-15 on its east side are railroad tracks. South of Primm is the Primm Valley Golf Club, which is located on approximately 500 acres slightly to the southeast of the existing transmission line.

There are no designated scenic vistas or state designated scenic highways within or within a view of the Project area. The portion of I-15 that extends roughly from the I-215 to the Nevada border is a San Bernardino Designated Scenic Highway. Although not defined as a state-designated scenic highway under CEQA, it is included for consideration during analysis of potential impacts.

The mountains and mountain ranges in the vicinity of the Proposed Project include the Clark Mountain Range, the Spring Mountain Range, the Lucy Gray Mountains, the New York Mountains, the McCullough Mountain Range, and the Highland Mountains. The nearest topographical feature to the Proposed Ivanpah Substation is a metamorphic outcrop located west of I-15. The Mojave National Preserve is located south of the Project, adjacent to a portion of the Telecommunication System near the California/Nevada border.

4.1.3.2 Local Setting

For the purpose of understanding the existing visual resources within the project vicinity, eight KOPs were identified. An additional five character photographs are also provided.

A BLM Visual Contrast Rating Worksheet, Form 8400-4 (September 1985) (BLM Form 8400-4), was prepared for each of the representative KOPs; completed forms are provided in Appendix C. Photographs of representative views from each KOP, character photographs, and a map with the location and direction of the view of each KOP photograph and character photograph is provided at the end of section 4.1. Photographs were taken during field visits on October 16, November 13, and November 14, 2008. The views from each KOP would vary from those shown depending on the season and the weather (e.g., rain could be present during winter months).

<u>Transmission Line</u>

The proposed transmission line and transmission line Alternatives A through E extend from the Eldorado Substation in Clark County, Nevada, to the Proposed Ivanpah Substation in San Bernardino County, California. Because of the length of the transmission line (35 miles), six KOPs and one character photograph were selected to characterize the local setting for the proposed transmission line. The proposed transmission line setting, as seen from each of these seven locations, is described as follows:

KOP 1 – View from the Transmission Corridor that Includes the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV Transmission Line

KOP 1 (Figure 4.1-2a, located in Map Volume) is a view from within the heavily used transmission corridor that includes the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line. This photograph was taken looking northeast into the McCullough Mountain Range and is representative of what a person recreating in the McCullough Mountain Range would see. The length of the view would be of medium duration, with the viewer tending to focus on recreational activities. Typical recreational activities in this area include off-highway vehicle (OHV) use and hiking, although there are no nearby trailheads or named trails in this area. KOP 1 is located within a BLM VRM Class III area, with views of VRM Class III and VRM Class II areas in the foreground and middleground.

KOP 1 shows the rolling and rocky terrain of the McCullough Mountain Range. The varying topography of the foreground creates a nearly horizontal, vertically inclining line, undulating to the eroded base of the mountains visible in the foreground and middleground; the background is not visible in this view. The nearly horizontal line inclines diagonally at the base of the mountains, transitioning into low and medium incised mountains. Light golden and tan soil, including randomly spaced tan, light brown, and black rock is visible giving the overall texture of the foreground a rocky and granular feel. Predominant colors of light golden to golden tan and slate-gray with visible striations of warm pink and wine-purple can be seen in the mountains located in the middleground. The land in the middleground has a smooth to granular texture; the mountains have a discontinuously rough feel. No water is visible in this view.

The vegetation of this view consists of irregularly rounded shrubs and ground cover with interspersed grasses, visible in the foreground and middleground. The shrubs and grasses are medium amber, gray-brown, and very light to medium sage-green, the shrubs having a bristly, pointy texture and the grasses a soft texture. Randomly spaced, irregularly shaped Joshua trees are also present in this view. The bristly textured Joshua trees are an overall light-brown and light sage-green. The vegetation in this view creates a generally weak horizontal line, appearing dense in the foreground and scattered as the foreground transitions to the middleground.

The Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line is present in this view, as well as other transmission lines not part of the Proposed Project. The portion of the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line visible in this view consists of gray H-frame LSTs and associated conductors. Other overlapping medium gray LSTs and rust brown TSPs are also present in the view.

KOP 1 is representative of the local Project setting in the vicinity of the McCullough Mountains and is also representative of Project elements (Telecommunication System Path 2) that traverse the Highland Range and New York Mountains.

KOP 2 – Representative View from South McCullough Wilderness

KOP 2 (Figure 4.1-3a, located in Map Volume) is a view from the western edge of the South McCullough Wilderness looking northwest towards the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line route, the I-15, and the Spring Mountain Range. This view is representative of what a person recreating near the South McCullough Wilderness would see. The length of the view would be of medium duration, with the viewer tending to focus on recreational activities. Typical recreational activities in this area include OHV use and hiking, although there are no nearby trailheads or named trails in this area. KOP 2 is located within and includes views of a BLM VRM Class III area.

KOP 2 shows the wide-open Ivanpah Valley and Jean Lake, framed by low mounded hills and low-lying incised mountains. While the foreground and middleground of the view are primarily horizontal, topographic variation is present in the down-sloping foreground and undulating hills and domed mountains in the view. The horizontal line of the valley smoothly inclines diagonally over the crest of the hills, transitioning into a smooth-to-jagged horizontal mountain skyline. The exposed soil in the view ranges from golden tan on the valley floor to white-tan on Jean Lake; the hills and mountains range from dark brown to gray-brown with a purple cast visible in the far mountains. Primarily sandy and rocky land is visible in the foreground, appearing smooth, almost velvety on the valley floor, roughening at the mountains and hills. No water is visible in this view.

Bristly, pointy shrubs and ground cover interspersed with soft mounded grasses is the typical vegetation visible in this view. The vegetation creates a generally weak horizontal line with colors including tan-brown, yellow-green, dark brown, and dark sage-green.

The Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line is present in this view, as well as other transmission lines not part of the Proposed Project. The portion of the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line present, while not visible, consists of gray H-frame LSTs, T-frame LSTs, and associated conductors. Golden tan dirt roads are also visible in this view. These diagonal and horizontal lines cross the wide open space of the Ivanpah Valley floor, but do not take away from the feeling of openness that accompanies this view.

KOP 2 is representative of the local Project setting throughout the Ivanpah Valley.

KOP 3 – I-15 Looking Southeast

KOP 3 (Figure 4.1-4a, located in Map Volume) is a view from I-15 looking southeast towards the UPRR, the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line route, Ivanpah Valley, Jean Lake, and the McCullough Mountain Range. This view is representative of what a southbound motorist on I-15 would see. The length of the view would be of short duration, a result of the speed at which a vehicle would be traveling. KOP 3 includes views of a BLM VRM Class III area.

KOP 3 shows the wide-open Ivanpah Valley and Jean Lake with the McCullough Mountain Range in the background. The foreground and middleground of the view is primarily horizontal, with some topographic variation present in the foreground as it slopes towards the middleground. The horizontal line of the middleground inclines diagonally at the base of the dark slate-brown low hills located in the background of the view, transitioning into the jagged horizontal skyline of the McCullough Mountain Range. The exposed soil in the foreground is light golden tan and has a sandy to rocky texture. The middleground colors range from the golden tan of the valley floor to the very light tan of the dry lake bed, appearing very smooth. The smooth valley floor transitions into the rough pockmarked mountains, which are dark brown; a purple cast is present in the far mountains. No water is visible in this view.

Vegetation is visible in the foreground of this view; vegetation present in the middleground and background is indistinguishable. Irregularly rounded red-brown, yellow-green, dark brown, and dark sage shrubs and ground cover create a generally weak horizontal line in the foreground. These shrubs and ground cover are randomly spaced and have an overall bristly, pointy texture.

The Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line is present in the background of this view, as well as other transmission lines not part of the Proposed Project. The portion of the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line present, while not visible, consists of gray H-frame LSTs, T-frame LSTs, and associated conductors. Golden tan dirt roads are present and barely visible in the background of this view. The UPRR, evenly spaced dark brown distribution poles, and a low-lying brown fence are clearly visible in the foreground of this view. These diagonal and horizontal lines cross the wide open space of the Ivanpah Valley floor, but do not take away from the feeling of openness that accompanies this view.

KOP 3 is representative of the local Project setting throughout the Ivanpah Valley.

KOP 4 – Desert Oasis Apartments

KOP 4 (Figure 4.1-5a, located in Map Volume) is a view from the Desert Oasis Apartment Complex in Primm, Nevada. This photograph was taken looking southwest towards the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line route and the Clark Mountain Range. The length of the view would be of short to long duration for the viewer leaving or returning home, or looking out of their window. KOP 4 is not located on BLM-managed land, but includes views of a BLM VRM Class III area.

KOP 4 shows the perimeter of the apartment complex in the foreground with the low, weathered Clark Mountain Range visible in the background; the middleground is not visible in this view. The visible land in the foreground creates a primarily horizontal line; the mountain range in the background creates an irregular horizontal skyline with jagged elements. The exposed soil in the foreground ranges from light to medium brown, and the mountain range in the background appears dark brown with shale to purple tint. The visible soil in the foreground has a coarse granular dirt texture, while the mountains appear smoothly weathered with some sharp peaks. No water is visible in this view.

The vegetation in this view is primarily landscaped and only visible in the foreground. Pointed trees and low bristly shrubs with interspersed palm trees make up the typical vegetation in this view. An irregularly horizontal line is created by the vegetation, with colors including pine-green, yellow-green, and dark green foliage and brown trunks.

The Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line is visible in the foreground and runs adjacent to the Desert Oasis Apartment complex. The visible portion of the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line consists of gray H-frame LSTs, T-framed LSTs, and associated conductors. A low, tan block wall; paved dark gray roadway; weathered white drainages and red curbing; black light poles; and terracotta apartment buildings are also visible in the foreground.

KOP 4 is representative of the local project setting in Primm, Nevada, the only urbanized area in the project vicinity.

KOP 5 – Ivanpah Lake East of I-15

KOP 5 (Figure 4.1-6a, located in Map Volume) is a view from the Ivanpah Lake east of the I-15 looking northwest towards the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line route, the I-15, the Spring Mountain Range, and the city of Primm. This view provides a representative image of what a person recreating at the lakebed would see. The length of the view would be of medium duration, with the viewer tending to focus on recreational activities. Typical recreational activities in this area include racing, archery, kite buggying, and land sailing. KOP 5 is located within and includes views of a BLM VRM Class III area.

KOP 5 shows the nearly flat Ivanpah Lake with the city of Primm and the low, weathered hills and mountains in the middleground and background. The foreground of this view is primarily horizontal with topographic variation in the middleground and background. The horizontal dry lake located in the middleground smoothly inclines diagonally over the crest of the hills, transitioning into the smooth-to-jagged horizontal mountain skyline of the Spring Mountain Range. The dry lake has a smooth to slightly coarse texture with striations of light and gold-tan coloring the land. The hills and mountains in the view appear discontinuously rough and smooth. The hills are colored a variation of light tan, dark brown, sandy beige, wine-purple, and slate; the mountains are a mottled gray and dark purple. No water is visible in this view.

A single short, domed shrub is located in the foreground, and is the only visible vegetation in this view. A circular line is created by this isolated, dark green scrubby shrub.

The Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line is present in this view, as well as other transmission lines not part of the Proposed Project. The portion of the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line present, while not visible, consists of gray LSTs and associated conductors. The slightly elevated I-15, short cylindrical poles, and buildings and signs associated with the city of Primm are also visible in this view; no structures are visible in the background.

KOP 5 is representative of the local Project setting throughout the Ivanpah Valley.

KOP 6 – I-15 Driving North

KOP 6 (Figure 4.1-7a, located in Map Volume) is a view from northbound I-15 looking northeast towards the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line route, the city of Primm, the Spring Mountain Range, and the Lucy Gray Mountains. The length of the view would be of short duration, a result of the speed at which a vehicle would be traveling. KOP 6 includes views of a BLM VRM Class III area.

KOP 6 shows the nearly flat Ivanpah Valley with the low, domed toe of the Spring Mountain Range located at the edge of the view; the Lucy Gray Mountains are visible in the background. The nearly horizontal Ivanpah Lake, which runs adjacent to the I-15, transitions into the irregular horizontal toe of the Spring Mountain Range, then into the weathered rugged skyline of the Lucy Gray Mountains. The exposed land in the view includes the golden tan dry lake with a slightly rough texture, and the golden desert brown and slate to wine-purple mountains with textures ranging from lumpy to pointed. No water is visible in this view.

Low mounded shrubs and interspersed grasses are visible in the foreground and represent the typical vegetation of this view. The distinct diagonal line of the vegetation parallels the I-15. The color of the vegetation ranges from golden tan to a light olive-green with an overall bristly and soft texture.

The Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line is present in this view, as well as other transmission lines not part of the Proposed Project. The portion of the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line present, while not visible, consists of gray LSTs and associated conductors. The flat I-15 and nearly vertical paralleling fence create a diagonal line which bisects the valley floor; nearly vertical road markers are randomly distributed along the interstate. The irregularly shaped and square-shaped buildings and signs of the city of Primm, and a slightly elevated overpass are also visible in this view.

Character Photograph 1

Character Photograph 1 (Figure 4.1-10, located at the end of Section 4.1) is the view from a dirt road west of the city of Primm looking southeast towards the city of Primm, the Ivanpah Valley, the Lucy Gray Mountains, and the existing transmission line route.

This view shows predominantly flat terrain with diagonally inclined low hills at the edge of the view, and a rough weathered skyline in the background. The vegetation consists primarily of medium to tall native brush with low-lying ground cover. Dark brown distribution poles and gray LSTs are present in this view, as is the city of Primm. Character Photograph 1 is illustrative of the desert areas surrounding the city of Primm.

<u>Substations</u>

Eldorado Substation

One KOP and one character photograph were selected to characterize the local setting for the Eldorado Substation. The setting, as seen from each of these locations, is described below.

KOP 7 – Highway 95 View Looking Southwest

KOP 7 (Figure 4.1-8a, located in Map Volume) is a view from southbound Highway 95 looking southwest towards the Eldorado Valley, the Eldorado Substation, the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line route, and the McCullough Mountain Range. The length of the view would be of short duration, a result of the speed at which a vehicle would be traveling. KOP 7 is a view of land within Boulder City; this land is not managed by the BLM, but will be evaluated as VRM Class III for purposes of this Project.

KOP 7 shows the Eldorado Valley with the McCullough Mountain Range visible in the background. The valley floor is flat with some topographic variation, sloping downhill from the foreground to the middleground. The valley floor transitions into intermittently smooth and rough alluvial fans at the base of the mountain range, then into an irregularly weathered form. The nearly horizontal line of the foreground and middleground diagonally inclines at the alluvial fans, becoming an irregularly horizontal skyline with rugged peaks. The exposed soil in the view ranges from light to golden-tan, to ash-brown on the valley floor; the fans and mountains range from warm pink, dark golden brown, gray-brown, and sage-green. Primarily sandy and gravelly land is visible in the foreground, appearing smooth on the valley floor, roughening at the fans and mountains. No water is visible in this view.

Vegetation in this view consists of low rounded scraggly, sharp shrubs, which create a generally horizontal, undulating line; the vegetation in the middleground and background is not distinguishable from this KOP. The color of the vegetation ranges from tan, light-green, and dark red-brown in the foreground to dusty greens and browns in the middleground.

In addition to the Eldorado Substation and the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line, other transmission lines not part of the Proposed Project are present in this view. The portion of the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line present, while not visible, consists of gray LSTs and associated conductors. A gray and green fence is visible in the foreground and creates a generally horizontal line with short vertical fence posts. A flat, blue reflective solar facility and two substations are located on the valley floor, creating complex horizontal and vertical lines associated with the solar panels, support buildings, and poles.

KOP 7 is representative of the local Project setting throughout the Eldorado Valley.

Character Photograph 2

Character Photograph 2 (Figure 4.1-11, located at the end of Section 4.1) is a view from Dry Lake west of Highway 95 looking southwest towards the existing Eldorado Substation.

Character Photograph 2 shows the predominantly flat dry lake and Eldorado Valley with the McCullough Mountain Range visible in the background. The dry lake primarily has a continuous firmly packed fractured texture; no vegetation is visible from this location. Facilities associated with the Eldorado Substation and nearby utility development are mostly indistinguishable from this location.

Proposed Ivanpah Substation

One KOP and one character photograph were selected to characterize the local setting for the Proposed Ivanpah Substation. The setting, as seen from each of these locations, is described below.

KOP 8 – Highway 164 Overpass View Looking Northwest

KOP 8 (Figure 4.1-9a, located in Map Volume) is a view from the I-15/Highway 164 Overpass looking northwest towards the Proposed Ivanpah Substation, Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line route, the Ivanpah Valley, the Ivanpah Lake, the Clark Mountain Range, the Spring Mountain Range, and the Lucy Gray Mountains. This photograph provides an elevated and, subsequently, enhanced view of what a motorist on northbound I-15 would see. The length of the view would be of short duration, a result of the speed at which a vehicle would be traveling. KOP 8 includes a view of a BLM VRM Class III area.

KOP 8 is a view of the Ivanpah Valley with the Clark Mountains Range, the Spring Mountain Range, and the Lucy Gray Mountains visible in the background. The valley floor is typically flat, sloping downhill from foreground to middleground with a low, diagonally sloping hill located west of the I-15. The Ivanpah Lake and the valley floor create a generally horizontal line with topographic variations at the isolated, low, conical hills, and the irregularly weathered mountains in the background. The exposed soil in the valley is predominantly golden tan, while the Ivanpah Lake is a light tan color. The hills and mountains range in color, from light-tan, dark golden brown, and mottled brown; the Lucy Gray Mountains have a warm pink cast. The gravelly texture of the foreground transitions into the generally smooth valley floor, then to the intermittently rough and smooth textured mountains. No water is visible in this view.

The typical vegetation visible in the view consists of low mounded, randomly spaced shrubs, which create a weak horizontal line. The color of the vegetation in this view ranges from sage-green to red-brown with an overall rough, bristly texture, that transitions into a smooth, velvety texture on the valley floor.

The Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line is present in this view, as well as other transmission lines not part of the Proposed Project. The portion of the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line present, while not visible, consists of gray LSTs and associated conductors. The I-15 and associated dividers and signs are visible in this view, as well as dirt roads and buildings associated with a former roadside service and the city of Primm. The gray and black I-15 creates a strong diagonal line curving north, transitioning to a vertical line sloping downhill from foreground to background. The tan dirt roads create diagonal lines crossing the valley floor, and the muted gray buildings associated with a former roadside service and the city of Primm appear chunky, almost lumpy in the background.

KOP 8 is representative of the local project setting throughout the Ivanpah Valley.

Character Photograph 3

Character Photograph 3 (Figure 4.1-12, located at the end of Section 4.1) is a view from near the Primm Valley Golf Club looking southwest towards the Proposed Ivanpah Substation.

The terrain in the view is generally horizontal with topographic variations and a rock outcrop visible in the middleground; the Clark Mountain Range is visible in the background. The vegetation in this view is predominantly low shrubs and ground cover, with random medium-tall bushes. In the middleground of the view, H-frame towers and LSTs are visible; no structures are visible in the foreground and background.

<u>Telecommunication System</u>

Telecommunication System Path 1

Path 1 of the Telecommunication System would follow the Proposed Project transmission line or transmission line Alternatives. As such, KOPs 1 through 8 (Figures 4.1-2 through 4.1-9, located in Map Volume) and Character Photographs 1 through 3 (Figures 4.1-10 through 4.1-12, located at the end of Section 4.1) describe the local setting for Path 1.

Telecommunication System Path 2

Path 2 of the Telecommunication System would originate at the Eldorado Substation. Path 2-Section 1 would run south from the Eldorado Substation through the Eldorado Valley between the McCullough Mountain Range and the Highland Mountain Range and then west of the Wee Thump Joshua Tree Wilderness before intersecting with Highway 164. Path 2-Section 2 would then run adjacent to Highway 164 to Nipton, California. Path 2-Section 3 would run adjacent to the Mojave National Preserve. At the I-15, Path 2-Section 3 would split into two alternatives. Alternative 1 would continue adjacent to Highway 164 to the Mountain Pass Substation and then north to the Proposed Ivanpan Substation. Alternative 2 would follow the I-15 north before turning west towards the Proposed Ivanpah Substation north of the Primm Valley Golf Club.

KOP 7 (Figure 4.1-8a, located in Map Volume) shows the local setting of the northern portion of Path 2 as it heads southward out of the Eldorado Substation through the Eldorado Valley. KOP 1 (Figure 4.1-2a, located in Map Volume) is representative of the local setting for the portion of Path 2 that travels between the McCullough Mountain Range and the Highland Range and crosses over the New York Mountains.

Two additional character photographs were selected to help illustrate the local setting for Path 2 of the Telecommunication System in the vicinity of Highway 164. The setting, as seen from each of these locations, is described as follows:

Character Photograph 4

Character Photograph 4 (Figure 4.1-13, located at the end of Section 4.1) is a view from Highway 164 between the New York Mountains and the McCullough Mountain Range looking northeast towards Wee Thump Joshua Tree Wilderness. This view includes an existing 500kV transmission line on which the Eldorado-Lugo portion of the telecommunication line would be strung for Path 2 of the Telecommunication System.

The terrain is rough and rolling with varying changes in elevation. The typical vegetation visible in this view consists primarily of low-lying native shrubs and randomly spaced trees. In the view, gray angular LSTs and H-frame LSTs are visible extending from foreground to background.

Character Photograph 5

Character Photograph 5 (Figure 4.1-14, located at the end of Section 4.1) is an easterly view along Highway 164 south of Ivanpah Lake and adjacent to the Mojave National Preserve. The I-15 to Nipton portion of Path 2 of the Telecommunication System would be located in this view.

The view is predominantly flat in the foreground, sloping upward in the middleground toward the peaks of the McCullough Mountain Range and New York Mountains. The sparse vegetation consists of low to medium shrubs and ground cover; colors vary from sage to medium green and dusty brown. Highway 164 bisects the view leading to Nipton, which is visible in the middleground.

4.1.4 Environmental Impacts and Mitigation Measures

4.1.4.1 Changes Associated with the Proposed Project

The Proposed Project would include replacement of the existing 115kV transmission line, expansion of the Eldorado Substation, construction of the Proposed Ivanpah Substation, and installation of a redundant Telecommunication System (Figure 4.1-1, located in Map Volume). Changes associated with each of these Project elements are described below.

Transmission Line

The Eldorado-Ivanpah 220kV transmission line would be approximately 35 miles long and located between the existing Eldorado Substation in Nevada and the Proposed Ivanpah Substation in California. The Eldorado-Ivanpah portion of the existing Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line would be removed and replaced with the proposed 220kV transmission line (Figure 4.1-1, located in Map Volume). A discussion of the proposed changes for the proposed transmission line and transmission line Alternatives A through E is provided below.

APMs AES-1 through AES-7 would be implemented for construction and operation of the proposed transmission line and transmission line Alternatives A through E.

Proposed Transmission Line

The proposed transmission line would follow the Eldorado-Ivanpah portion of the existing Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV transmission line route (existing transmission line route), running within the existing ROW as applicable. At varying locations along the proposed transmission line, the existing ROW would be widened to meet SCE minimum standards. Where widening the ROW to SCE standard would not be possible, SCE would reroute the new line as needed before rejoining the existing ROW.

The proposed transmission line would originate at the Eldorado Substation, which is located in the Eldorado Valley within the Boulder City limits. While the land within the city limits is not managed by the BLM, it will be evaluated as VRM Class III for purposes of this Project. The proposed transmission line route within the city limits would run southwest, and then turn northwest towards the base of the McCullough Mountain Range, following the existing transmission line route. The McCullough Mountain Range can be clearly seen in KOP 7 (Figure 4.1-8a, located in Map Volume) and Character Photograph 2 (Figure 4.1-11, located at the end of Section 4.1); the Eldorado Substation is visible in KOP 7, but it is not visible in Character Photograph 2. The proposed transmission line would run along the base of the mountain range to a location approximately 0.5 mile north of the McCullough Pass. From there, the proposed transmission line would cross the McCullough Mountain Range following the existing transmission line route visible in KOP 1 (Figure 4.1-2a, located in Map Volume). As the proposed transmission line crosses into the mountain range, it would leave Boulder City and enter land managed by the BLM. The McCullough Mountain Range is managed by the BLM as VRM Class II, with the exception of the South McCullough Wilderness to the south and the North McCullough Wilderness to the north, which are managed as VRM Class I.

The proposed transmission line would generally follow the existing transmission line route through the Ivanpah Valley. The wide expanse of this portion of the valley can be seen from KOP 2 (Figure 4.1-3a, located in Map Volume) and KOP 3 (Figure 4.1-4a, located in Map Volume). The Ivanpah Valley, including Jean Lake, Roach Lake, and Ivanpah Lake are managed by the BLM as VRM Class III (BLM 2008a; BLM 2008b). The proposed transmission line would pass east of Roach Lake, and then through the city of Primm as it crosses through the Ivanpah Valley. The land within the city of Primm, not managed by the BLM, will be evaluated as VRM Class III for purposes of this Project. The existing transmission line route is visible from various locations in the city of Primm; the existing transmission line is visible in KOP 4 (Figure 4.1-5a, located in Map Volume) and is present, but barely visible, in KOPs 5 (Figure 4.1-6a, located in Map Volume) and 6 (Figure 4.1-7a, located in Map Volume). The existing transmission line route is also present in Character Photograph 1 (Figure 4.1-10, located at the end of Section 4.1), but is not visible from this location.

After leaving the city of Primm, the proposed transmission line would continue to follow the existing transmission line route, bisecting Ivanpah Lake in California. The proposed transmission line would then pass along the west side of the Primm Valley Golf Club before terminating at the Proposed Ivanpah Substation. These California BLM lands are managed as VRM Class III (BLM 2008b). Character Photograph 3 (Figure 4.1-12, located at the end of Section 4.1), taken from the southwest corner of the Primm Valley Golf Club, clearly shows the existing transmission line route and the location of the Proposed Ivanpah Substation.

Throughout the length of the proposed transmission line, the existing 115kV transmission structures (primarily H-frame lattice structures, approximately 70 feet high) would be removed and replaced with new 220kV structures. Most new transmission structures would be LSTs approximately 113 to 180 feet high. In certain locations where the ROW is narrow or the transmission line would need to cross under other lines, SCE would use tubular steel structures.

Transmission Line Alternative A

Transmission line Alternative A would originate at the Eldorado Substation. From the Eldorado Substation, transmission line Alternative A would follow the existing transmission line route southwest toward the McCullough Mountain Range. While the existing transmission line route turns northwest before continuing southwest to run along the base of the McCullough Mountain Range, transmission line Alternative A would continue southwest to the entrance of the McCullough Pass. Before entering the pass, transmission line Alternative A would turn northwest, reconnecting with the existing transmission line route. After reconnecting with the existing transmission line route, transmission line Alternative A would then follow the same route as the proposed transmission line, terminating at the Proposed Ivanpah Substation (Figure 4.1-1, located in Map Volume). Transmission structures used for transmission line Alternative A would be the same as described for the proposed transmission line.

Transmission Line Alternative B

Transmission line Alternative B would originate at the Eldorado Substation. From the Eldorado Substation, transmission line Alternative B would run north-northeast approximately 2.5 miles before turning southwest and reconnecting with the existing transmission line route. After reconnecting with the existing transmission line route, transmission line Alternative B would then follow the same route as the proposed transmission line, terminating at the Proposed Ivanpah Substation (Figure 4.1-1, located in Map Volume). Transmission structures used for transmission line Alternative B would be the same as described for the proposed transmission line.

Transmission Line Alternative C

Transmission line Alternative C would originate at the Eldorado Substation. From the Eldorado Substation, transmission line Alternative C would follow the same route as the proposed transmission line to a point 0.16 mile north of the city of Primm. Transmission line Alternative C would then run southwest, cross the I-15, turn south-southwest, pass through the Spring Mountain Range, and then reconnect with the existing transmission line route approximately 2.75 miles south of the city of Primm. Transmission line Alternative C would cross the northeast corner of Primm's city limits, but would not run through the center of Primm; this alternative would completely avoid the Ivanpah Lake. After reconnecting with the existing transmission line route, transmission line Alternative C would follow the same route as the proposed transmission line, terminating at the Proposed Ivanpah Substation (Figure 4.1-1, located in Map Volume). Transmission structures used for transmission line Alternative C would be the same as described for the proposed transmission line.

Transmission Line Alternative D

Transmission line Alternative D would originate at the Eldorado Substation. From the Eldorado Substation, transmission line Alternative D would follow the same route as the Proposed Transmission Line to a point 0.25 mile north of the city of Primm. Transmission line Alternative D would then run southeast for approximately 1.5 miles before turning southwest and reconnecting with the existing transmission line route approximately 1.25 miles south of the city of Primm. Transmission line Alternative D would cross the city limits of Primm and Ivanpah Lake, but would not run through the center of Primm. After reconnecting with the existing transmission line route, transmission line Alternative D would follow the same route as the proposed transmission line, terminating at the Proposed Ivanpah Substation (Figure 4.1-1, located in Map Volume). Transmission structures used for transmission line Alternative D would be the same as described for the proposed transmission line.

Transmission Line Alternative E

Transmission line Alternative E is a variation of transmission line Alternative D. Transmission line Alternative E follows the same proposed route as transmission line Alternative D, except transmission line Alternative E turns southeast farther south than transmission line Alternative D, approximately 0.15 mile inside Primm's city limits. Transmission line Alternative E reconnects with transmission line Alternative D outside Primm's city limits, after running southeast for approximately 0.50 mile. After reconnecting with transmission line Alternative D, transmission line Alternative E would follow the same route as transmission line Alternative D, terminating at the Proposed Ivanpah Substation (Figure 4.1-1, located in Map Volume). Transmission structures used for transmission line Alternative E would be the same as described for the proposed transmission line.

Evaluation of Transmission Line Changes on Key Observation Points

Figures 4.1-2 through 4.1-9 depict representative views of the existing conditions in (a) and simulated project facilities in (b) for each KOP (1 through 8).

KOP 1 – View from the Transmission Corridor that Includes the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV Transmission Line

Construction of the proposed transmission line would be visible in KOP 1. Construction would result in short-term changes to the foreground and middleground of the existing environment of this view (Figure 4.1-2a, located in Map Volume). Construction of new access roads, decommissioning of existing H-frame LST and T-frame LST transmission towers, installation of Telecommunication System Path 1, and preparation of the transmission line tower structure sites would result in temporary generation of fugitive dust and temporary clearing of vegetation that would be visible from KOP 1. Large equipment, delivery trucks, and construction equipment would be present during construction, and movement of such vehicles would be visible. Transmission towers would become visible as they are erected throughout the construction period.

Project operation would result in long-term changes to the foreground and middleground of the existing environment of KOP 1 (Figure 4.1-2b, located in Map Volume). Long-term visible changes would result from the addition of H-frame TSP structures, LSTs, Telecommunication System Path 1, and associated conductors in the foreground, and LSTs in the middleground. H-frame TSPs are used at this point along the proposed transmission line to allow the proposed line to cross under the remaining existing transmission line visible in the foreground and middleground in this view. The H-frame TSPs, LSTs, Telecommunication System Path 1, and associated conductors would be visible in the foreground in this view; LSTs would be barely visible in the middleground in this view. The proposed transmission line would blend in with the McCullough Mountain Range and with the remaining existing transmission lines present in KOP 1. The H-frame TSPs and the LSTs would replace the existing H-frame and T-frame transmission line in this view, creating a moderate change to the line of the structures in the foreground and a weak change to the line of the structures in the middleground. Areas permanently cleared of vegetation for access roads and transmission line towers could be visible in the foreground of KOP 1.

The impacts of Project decommissioning would be similar to those described for Project construction, including the generation of fugitive dust and the presence of work vehicles and heavy equipment. Measures to reduce airborne dust would minimize potential effects to the visual environment during Project decommissioning, and measures to restore areas temporarily cleared of vegetation during decommissioning would minimize potentially long-term effects to the visual environment.

Implementation of the proposed transmission line in the view from KOP 1, including construction, operation, and decommissioning, would result in a weak change to the form, line, color, and texture of the land/water body and vegetation. Construction, operation, and decommissioning of the proposed transmission line in this view would result in a moderate change in the form, line, color, and texture for structures present in the foreground of the existing environment, and a weak change to the form, line, color, and texture for structures present in middleground of the existing environment. The changes to the existing environment would be consistent with the VRM Class III assigned to the foreground and middleground of these BLM-managed lands. The changes to the environment would also be consistent with the VRM Class II assigned to the middleground of these BLM-managed lands. Therefore, implementation of the proposed transmission line would result in no adverse effect and mitigation would not be required.

Transmission Line Alternatives A through E would be visible in this view. These alternatives would follow the same route as the portion of the proposed transmission line present in this view. The changes to the existing environment would be the same as those discussed above for the proposed transmission line. These changes would be consistent with the VRM Class III assigned to the foreground and middleground of these BLM-managed lands; the changes to the environment would be consistent with the VRM Class II assigned to the middleground of these BLM-managed lands. Therefore, implementation of transmission line Alternatives A through E would result in no adverse effect and mitigation would not be required.

KOP 2 – Representative View from South McCullough Wilderness

Construction of the proposed transmission line could be visible in this view. Construction would result in short-term changes to the middleground of the existing environment of KOP 2 (Figure 4.1-3, located in Map Volume). Construction of new access roads, decommissioning of existing transmission towers, installation of Telecommunication System Path 1, and preparation of the transmission line tower structure sites would result in temporary generation of fugitive dust and temporary clearing of vegetation that could be visible in KOP 2 under certain conditions. Large equipment, delivery trucks, and construction equipment would be present during construction, and movement of such vehicles could be visible. Transmission towers would become increasingly evident as they are erected throughout the construction period.

Project operation would result in long-term changes to the middleground of the existing environment of KOP 2 (Figure 4.1-3b, located in Map Volume). Long-term changes would result from the addition of LSTs, Telecommunication System Path 1, and associated conductors. These Project elements would barely be visible to not visible under certain conditions. LSTs would replace the existing H-frame LST and T-frame LST transmission line, resulting in a weak change to the line of the structures visible in the view. Areas permanently cleared of vegetation for access roads and transmission line towers would also barely be visible to not visible in KOP 2.

The impacts of project decommissioning would be similar to those described for Project construction, including the generation of fugitive dust and the presence of work vehicles and heavy equipment. Measures to reduce airborne dust would minimize potential effects to the visual environment during Project decommissioning.

Implementation of the proposed transmission line in this view, including construction, operation, and decommissioning, would result in a weak change in the form, line, color, and texture of the land/water body, vegetation, and structures present in the existing environment. The changes to the existing environment would be consistent with the VRM Class III assigned to these BLM-managed lands. Therefore, implementation of the proposed transmission line would result in no adverse effect and mitigation would not be required.

Transmission line Alternatives A through E would barely be visible to not visible in this view. These alternatives would follow the same route as the portion of the proposed transmission line present in this view. The changes to the existing environment would be the same as those discussed above for the proposed transmission line. These changes would be consistent with the VRM Class III assigned to these BLM-managed lands. Therefore, implementation of transmission line Alternatives A through E would result in no adverse effect and mitigation would not be required.

KOP 3 – I-15 Looking Southeast

Construction of the proposed transmission line would not be visible in this view. Construction would result in short-term changes to the background of the existing environment similar to those described for KOP 2.

Project operation would result in long-term changes to the background of the existing environment of KOP 3 (Figure 4.1-4b, located in Map Volume) similar to those described for KOP 2 (Figure 4.1-3b, located in Map Volume). Approximately 7 miles away, changes to structures in the background would not be visible in this view.

The impacts of Project decommissioning would be similar to those described for Project construction, including the generation of fugitive dust and the presence of work vehicles and heavy equipment. Measures to reduce airborne dust would minimize potential effects to the visual environment during Project decommissioning.

Implementation of the proposed transmission line in this view, including construction, operation, and decommissioning, would result in no visible change in the form, line, color, and texture of the land/water body, vegetation, and structures present in the existing environment. The changes to the existing environment would be consistent with the VRM Class III assigned to these BLM-managed lands. Therefore, implementation of the proposed transmission line would result in no adverse effect and mitigation would not be required.

Transmission Line Alternatives A through E would be present, but not visible, in this view. These alternatives would follow the same route as the portion of the proposed transmission line present in this view. The changes to the existing environment would be the same as those discussed above for the proposed transmission line. These changes would be consistent with the VRM Class III assigned to these BLM-managed lands. Therefore, implementation of transmission line Alternatives A through E would result in no adverse effect and mitigation would not be required.

KOP 4 – Desert Oasis Apartments

Construction of the proposed transmission line would be visible in this view. Construction would result in short-term changes to the foreground of the existing environment of KOP 4 (Figure 4.1-

5, located in Map Volume). Construction of new access roads, decommissioning of existing transmission towers, installation of Telecommunication System Path 1, and preparation of the transmission line tower structure sites would result in temporary generation of fugitive dust that would be visible from KOP 4. Large equipment, delivery trucks, and construction equipment would be present during construction, and movement of such vehicles could be visible. Transmission towers and associated conductors would be visible in the foreground as they are erected throughout the construction period.

Project operation would result in long-term changes to the foreground of the existing environment of KOP 4 (Figure 4.1-5b, located in Map Volume). Long-term visible changes would result from the addition of LSTs, Telecommunication System Path 1, and associated conductors in the foreground. The LSTs would replace the existing transmission line in this view, resulting in a weak change to the line of the structures in the foreground. Areas permanently cleared of vegetation for access roads and transmission line towers would not be visible in the foreground of KOP 4.

The impacts of Project decommissioning would be similar to those described for Project construction, including the generation of fugitive dust and the presence of work vehicles and heavy equipment. Measures to reduce airborne dust would minimize potential effects to the visual environment during Project decommissioning.

Implementation of the proposed transmission line in this view, including construction, operation, and decommissioning, would result in no visible change in the form, line, color, and texture of the land/water body and vegetation. Construction, operation, and decommissioning of the proposed transmission line in this view would result in a weak change in the form, line, color, and texture for structures present in the foreground of the existing environment. The changes to the existing environment would be consistent with the VRM Class III assigned to these BLM-managed lands. Therefore, implementation of the Proposed Transmission Line would result in no adverse effect and mitigation would not be required.

Transmission line Alternatives A and B would be visible in this view. These alternatives would follow the same route as the portion of the proposed transmission line present in this view. The changes to the existing environment would be the same as those discussed above for the proposed transmission line. These changes would be consistent with the VRM Class III assigned to these BLM-managed lands. Therefore, implementation of transmission line Alternatives A and B would result in no adverse effect and mitigation would not be required.

Transmission line Alternative C would not be visible in this view. This alternative would re-route the proposed transmission line to the west of the city of Primm, through the Spring Mountain Range, and would run along the west side of the Ivanpah Lake before reconnecting with the existing transmission line route. Implementation of this route would result in the removal of the existing transmission line adjacent to the Desert Oasis Apartment Complex. These changes would be consistent with the VRM Class III assigned to these BLM-managed lands. Therefore, implementation of transmission line Alternative C would result in no adverse effect and mitigation would not be required.

Transmission line Alternatives D and E would not be visible in this view. These alternatives would re-route the proposed transmission line to the east of the city of Primm, crossing the Ivanpah Lake before reconnecting with the existing transmission line route. Implementation of these routes would result in the removal of the existing transmission line adjacent to the Desert Oasis Apartment Complex. These changes would be consistent with the VRM Class III assigned to these BLM-managed lands. Therefore, implementation of transmission line Alternatives D and E would result in no adverse effect and mitigation would not be required.

KOP 5 – Ivanpah Lake East of I-15

Construction of the proposed transmission line could be visible in this view under certain conditions. Construction would result in short-term changes to the middleground of the existing environment of KOP 5 (Figure 4.1-6, located in Map Volume) similar to those described for KOP 2 (Figure 4.1-3, located in Map Volume).

Project operation would result in long-term changes to the middleground of the existing environment of KOP 5 (Figure 4.1-6b, located in Map Volume) similar to those described for KOP 2 (Figure 4.1-3b, located in Map Volume). The LSTs, Telecommunication System Path 1, and associated conductors would generally blend in against the backdrop of the Spring Mountain Range and would barely be visible to not visible in KOP 5. Access roads, another permanent element of the Project, and other areas permanently cleared of vegetation would likely not be visible from KOP 5.

The impacts of Project decommissioning would be similar to those described for Project construction, including the generation of fugitive dust and the presence of work vehicles and heavy equipment. Measures to reduce airborne dust would minimize potential effects to the visual environment during Project decommissioning, and measures to restore areas temporarily cleared of vegetation during decommissioning would minimize potentially long-term effects to the visual environment.

Implementation of the proposed transmission line in this view, including construction, operation, and decommissioning, would result in no visible change in the form, line, color, and texture of the land/water body and vegetation. Construction, operation, and decommissioning of the proposed transmission line in this view would result in a weak change in the form, line, color, and texture for structures present in the existing environment. The changes to the existing environment would be consistent with the VRM Class III assigned to these BLM-managed lands. Therefore, implementation of the proposed transmission line would result in no adverse effect and mitigation would not be required.

Transmission line Alternatives A and B would be barely visible to not visible in this view. These alternatives would follow the same route as the portion of the proposed transmission line present in this view. The changes to the existing environment would be the same as those discussed above for the proposed transmission line. These changes would be consistent with the VRM Class III assigned to these BLM-managed lands. Therefore, implementation of transmission line Alternatives A and B would result in no adverse effect and mitigation would not be required.

Transmission line Alternative C would not be visible in this view. This alternative would re-route the proposed transmission line to the west of the city of Primm, through the Spring Mountain Range, and would run along the west side of the Ivanpah Lake before reconnecting with the existing transmission line route. Implementation of this route would result in the removal of the existing H-frame and T-frame transmission line barely visible in this view. These changes would be consistent with the VRM Class III assigned to these BLM-managed lands. Therefore, implementation of transmission line Alternative C would result in no adverse effect and mitigation would not be required.

Transmission line Alternatives D and E would be visible to barely visible in this view, as shown in KOP 5 (Transmission Line Alternative D) (Figure 4.1-15, located in Map Volume). These alternatives would re-route the proposed transmission line to the east of the city of Primm, crossing the Ivanpah Lake before reconnecting with the existing transmission line route. Implementation of these routes would result in the removal of the existing H-frame and T-frame transmission line barely visible in this view. These changes would be consistent with the VRM Class III assigned to these BLM-managed lands. Therefore, implementation of transmission line Alternatives D and E would result in no adverse effect and mitigation would not be required.

KOP 6 – I-15 Driving North

Construction of the proposed transmission line could be visible in this view. Construction would result in short-term changes to the middleground of the existing environment of KOP 6 (Figure 4.1-7, located in Map Volume) similar to those described for KOP 5 (Figure 4.1-3, located in Map Volume).

Project operation would result in long-term changes to the middleground of the existing environment of KOP 6 (Figure 4.1-7b, located in Map Volume) similar to those described for KOP 2 (Figure 4.1-3b, located in Map Volume). The LSTs, Telecommunication System Path 1, and associated conductors would generally blend in against the backdrop of the Spring Mountain Range and with the remaining existing transmission lines present in the view; these Project elements would barely be visible to not visible in KOP 6. Access roads and other areas permanently cleared of vegetation would likely not be visible from KOP 6.

The impacts of Project decommissioning would be similar to those described for Project construction, including the generation of fugitive dust and the presence of work vehicles and heavy equipment. Measures to reduce airborne dust would minimize potential effects to the visual environment during Project decommissioning, and measures to restore areas temporarily cleared of vegetation during decommissioning would minimize potential long-term effects to the visual environment.

Implementation of the proposed transmission line in this view, including construction and operation of the proposed transmission line and Project decommissioning, would result in no visible change in the form, line, color, and texture of the land/water body and vegetation. Construction, operation, and decommissioning of the proposed transmission line in this view would result in a weak change in the form, line, color, and texture for structures present in the existing environment. The changes to the existing environment would be consistent with the VRM Class III assigned to these BLM-managed lands. Therefore, implementation of the proposed transmission line would result in no adverse effect and mitigation would not be required.

Transmission line Alternatives A and B would be barely visible to not visible in this view. These alternatives would follow the same route as the portion of the Proposed Transmission Line present in this view. The changes to the existing environment would be the same as those discussed above for the proposed transmission line. These changes would be consistent with the VRM Class III assigned to these BLM-managed lands. Therefore, implementation of transmission line Alternatives A and B would result in no adverse effect and mitigation would not be required.

Transmission line Alternative C would not be visible in this view. This alternative would re-route the Proposed Transmission Line to the west of the city of Primm, through the Spring Mountain Range, and would run along the west side of the Ivanpah Lake before reconnecting with the existing transmission line route. Implementation of this route would result in the removal of the existing H-frame and T-frame transmission line barely visible in this view. These changes would be consistent with the VRM Class III assigned to these BLM-managed lands. Therefore, implementation of transmission line Alternative C would result in no adverse effect and mitigation would not be required.

Transmission line Alternatives D and E would be visible to barely visible in this view. These alternatives would re-route the proposed transmission line to the east of the city of Primm, crossing the Ivanpah Lake before reconnecting with the existing transmission line route. Implementation of these routes would result in the removal of the existing H-frame and T-frame transmission line barely visible in this view. These changes would be consistent with the VRM Class III assigned to these BLM-managed lands. Therefore, implementation of transmission line Alternatives D and E would result in no adverse effect and mitigation would not be required.

Substations

Eldorado Substation

The Eldorado Substation is located in the Eldorado Valley, south of Dry Lake and east of the McCullough Mountain Range. The substation is located within Boulder City and while the land within Boulder City is not managed by the BLM, it will be evaluated as VRM Class III for purposes of this Project. The Proposed Project would require the existing 220kV Switchyard be extended 165 feet to the west within the existing substation fence. The Eldorado Substation is visible in KOP 7 (Figure 4.1-8a, located in Map Volume), lying just beyond the solar facility.

APMs AES-3 through AES-8 would be implemented for construction and operation of the Eldorado Substation.

Proposed Ivanpah Substation

The Proposed Ivanpah Substation is located in the Ivanpah Valley, west of Ivanpah Lake and the Primm Valley Golf Club, and east of the Clark Mountain Range. The Proposed Ivanpah Substation would be located within San Bernardino County, and managed by the BLM as VRM Class III (BLM 2008a). Character Photograph 3 (Figure 4.1-11, located at the end of Section 4.1) taken from the southwest corner of the Primm Valley Golf Club, clearly shows the existing transmission line route and the site of the Proposed Ivanpah Substation. The Clark Mountain Range, the Spring Mountain Range, and the Lucy Gray Mountains are visible in the background of KOP 8 (Figure 4.1-9a, located in Map Volume). The total substation site area would be approximately 35.2 acres. Changes to the existing environment would include grading, clearing of vegetation, the installation of substation equipment, and installation of one 180-foot microwave tower. While the proposed microwave tower and the proposed transmission line route are present in KOP 8, the tower and lines are not visible, giving the valley a wide open feel (Figure 4.1-1, located in Map Volume).

APMs AES-3 through AES-8 would be implemented for construction and operation of the Proposed Ivanpah Substation.

Evaluation of Substation Changes on Key Observation Points

KOP 7 – Highway 95 View Looking Southwest

Construction of the proposed transmission line and the Eldorado Substation for the Proposed Project could be visible in this view under certain conditions. Construction would result in short-term changes to the middleground of the existing environment of KOP 7 (Figure 4.1-8, located in Map Volume). Construction of new access roads, decommissioning of existing transmission towers, preparation of the transmission line tower structure sites, installation of Telecommunication System Path 1, and expansion of the Eldorado Substation would result in temporary generation of fugitive dust that could be visible in KOP 7 under certain conditions, and temporary clearing of vegetation that would not be visible in KOP 7. Large equipment, delivery trucks, and construction equipment would be present during construction, and movement of such vehicles could be visible.

Project operation would result in long-term changes to the middleground of the existing environment of KOP 7 (Figure 4.1-8b, located in Map Volume). Long-term changes would result from the addition of LSTs, associated conductors, Telecommunication System Path 1, and expansion of the Eldorado Substation in the middleground; these new facilities in the middleground would not be visible in KOP 7. Areas permanently cleared of vegetation for access roads and transmission line towers would not be visible in the middleground of KOP 7.

The impacts of Project decommissioning would be similar to those described for Project construction, including the generation of fugitive dust and the presence of work vehicles and heavy equipment. Measures to reduce airborne dust would minimize potential effects to the visual environment during Project decommissioning and would minimize potentially long-term effects to the visual environment.

Implementation of the proposed transmission line and the expansion of the Eldorado Substation in this view, including construction, operation, and decommissioning, would result in no visible change in the form, line, color, and texture of the land/water body, vegetation, and structures in the existing environment. The changes to the existing environment would be consistent with the VRM Class III that was assigned to Boulder City lands for purposes of this analysis. Therefore, implementation of the proposed transmission line and the expansion of the Eldorado Substation would result in no adverse effect and mitigation would not be required.

Transmission line Alternative A would be present, but not visible, in this view. This alternative would follow the same route as the portion of the proposed transmission line present in this view, except for a portion in the far middleground of this view. In the far middleground the alternative would continue running southwest toward the McCullough Pass, instead of turning northwest to follow the existing transmission line route. This alternative would reconnect with the existing transmission line before entering the McCullough Mountain Range. These changes would be consistent with the VRM Class III that was assigned to Boulder City lands for purposes of this analysis. Therefore, implementation of transmission line Alternative A and the expansion of the Eldorado Substation would result in no adverse effect and mitigation would not be required.

Transmission line Alternative B would be present, but not visible, in this view. This alternative would originate at the Eldorado Substation, and then run north-northeast before turning southwest, reconnecting with the existing transmission line route in the far middleground of this view. These changes would be consistent with the VRM Class III that was assigned to Boulder City lands for purposes of this analysis. Therefore, implementation of transmission line Alternative B and the expansion of the Eldorado Substation would result in no adverse effect and mitigation would not be required.

Transmission line Alternatives C, D, and E would be present, but not visible, in this view. These alternatives would follow the same route as the portion of the proposed transmission line present in this view. The changes to the existing environment would be the same as those discussed above for the proposed transmission line. These changes would be consistent with the VRM Class III that was assigned to Boulder City lands for purposes of this analysis. Therefore, implementation of transmission line Alternatives C, D, and E and the Eldorado Substation would result in no adverse effect and mitigation would not be required.

KOP 8 – Highway 164 Overpass View Looking Northwest

Construction of the proposed transmission line and the Proposed Ivanpah Substation could be visible in this view under certain conditions. Construction would result in short-term changes to the background of the existing environment of KOP 8 (Figure 4.1-9, located in Map Volume). Construction of new access roads, decommissioning of existing transmission towers, preparation of the transmission line tower structure sites, installation of the microwave tower, installation of Telecommunication System Path 1, and construction of the Proposed Ivanpah Substation would result in temporary generation of fugitive dust that could be visible in KOP 8 under certain conditions, and temporary clearing of vegetation that would not be visible in KOP 8. Large equipment, delivery trucks, and construction equipment would be present during construction, and movement of such vehicles could be visible.

Project operation would result in long-term changes to the background of the existing environment of KOP 8 (Figure 4.1-9b, located in Map Volume). Long-term changes would be the result of the addition of LSTs, associated conductors, microwave tower, Telecommunication System, the Proposed Ivanpah Substation, and vegetation clearing. The Proposed Ivanpah Substation would be visible in the background of KOP 8; the LSTs, associated conductors, microwave tower, and Telecommunication System would not be visible. Areas permanently cleared of vegetation for the Proposed Ivanpah Substation could be visible in the background of KOP 8; permanently cleared vegetation for access roads and transmission line towers would not be visible.

The impacts of Project decommissioning would be similar to those described for Project construction, including the generation of fugitive dust and the presence of work vehicles and heavy equipment. Measures to reduce airborne dust would minimize potential effects to the visual environment during Project decommissioning and would minimize potentially long-term effects to the visual environment.

Implementation of the proposed transmission line and the Proposed Ivanpah Substation in this view, including construction, operation, and decommissioning, would result in no visible change in the form, line, and texture of the land/water body, and no visible change in the form, color, and texture of vegetation in the existing environment. Construction, operation, and decommissioning would result in a weak change in the color of the land/water body, a weak change in the line of vegetation, and a weak change in the form, line, color, and texture of the structures in the background of KOP 8. The changes to the existing environment would be consistent with the VRM Class III assigned to these BLM-managed lands. Therefore, implementation of the proposed transmission line and the Proposed Ivanpah Substation would result in no adverse effect and mitigation would not be required.

Transmission line Alternatives A through E would be present, but not visible, in this view. These alternatives would follow the same route as the portion of the proposed transmission line present in this view. The changes to the existing environment would be the same as those discussed above for the proposed transmission line. These changes would be consistent with the VRM Class III assigned to these BLM-managed lands. Therefore, implementation of Alternatives A through E and the Proposed Ivanpah Substation would result in no adverse effect and mitigation would not be required.

<u>Telecommunication System</u>

Telecommunication System Path 1

Telecommunication System Path 1 (Path 1) would originate at the Eldorado Substation, located in the Eldorado Valley. Path 1 would run from the Eldorado Substation to the Proposed Ivanpah Substation and would follow the same route as the transmission line route selected for the Proposed Project (Figure 4.1-1, located in Map Volume).

The APMs listed for the proposed transmission line and the transmission line Alternatives A though E would apply to Telecommunication System Path 1.

Telecommunication System Path 2

Telecommunication System Path 2 (Path 2) (Figure 4.1-1, located in Map Volume) would originate at the Eldorado Substation, located in the Eldorado Valley. Path 2 would be divided into three sections: Section 1, Section 2, and Section 3. After leaving the substation, Path 2-Section 1 would run adjacent to the existing access roads running north-south between the McCullough Mountain Range and the Highland Mountain Range. The line would pass between the South McCullough Wilderness and the Wee Thump Joshua Tree Wilderness, but would not enter either. The land that Path 2-Section 1 runs through is managed as VRM Class III from the Eldorado Substation to the beginning of the McCullough Mountain Range and the Highland

Range; the land is then managed as Class II (BLM 2008a). Section 1 would then end at Highway 164, between the New York Mountains and the McCullough Mountain Range. Character Photograph 4 (Figure 4.1-13, located at the end of Section 4.1) is a view of the rolling terrain at this intersection. The view also includes Highway 164 and the existing Eldorado-Lugo transmission line.

Path 2-Section 2 would begin at the end of Path 2-Section 1. Path 2-Section 2 would run southwest adjacent to Highway 164 to Nipton, California.

Path 2-Section 3 is from the town of Nipton to the Ivanpah Substation. It has a preferred route (Section 3A) and two alternate routes. The preferred route from the town of Nipton to the Ivanpah Substation is via a microwave transmission system over 12 miles of microwave path (Path 2-Section 3A). A telecommunication site northeast of the town of Nipton would be built to maintain an approximately 180-foot-tall microwave tower. The communication site would be approximately 100 feet by 100 feet. The Path 2-Section 2 fiber cable would extend from the town of Nipton in an underground duct that would terminate at the communication site. A distribution line would be extended from the town of Nipton to the communication site for power connection. At the Ivanpah Substation, a microwave tower approximately 180 feet tall would be built to link to the Nipton communication site via the air microwave path.

Path 2-Section 3-Alternates 1 and 2 share the same route west from the town of Nipton to the Nipton Road and I-15 junction point. The BLM land that the shared portion would run through is managed by the BLM as VRM Class III (BLM 2008b).

From the I-15 and Nipton Road junction point, Alternatives 1 and 2 take divergent courses, both following the existing Nipton 33kV distribution line to the Ivanpah Substation.

Path 2-Section 3-Alternatives 1 and 2 from Nipton to the I-15 junction point are a combination of ADSS fiber cable on existing Nipton 33kV wood pole lines and underground fiber cable. Approximately 1 mile of ADSS fiber cable would be installed on the existing Nipton 33kV distribution line immediately west of Nipton, on the north side of Nipton Road. From the westernmost pole on the Nipton line before it crosses Nipton Road to the south, fiber optic cable would be installed in an underground duct along the north side of Nipton Road in new roadside ROW to the intersection of Nipton Road and I-15. The estimated underground cable length for this segment is approximately 9 miles.

Path 2-Section 3-Alternative 1 would run west from the end of the shared portion of the line, and would then turn northwest to the Mountain Pass Substation, running adjacent to Highway 164 through the Ivanpah Valley. The line would then run northeast through the Ivanpah Valley from the Mountain Pass Substation, terminating at the Proposed Ivanpah Substation. The land that Section 3-Alternative 1 runs through is managed by the BLM as VRM Class III (BLM 2008b). Path 2-Section 3-Alternative 2 would run north, then northeast from the end of the shared portion of the line. The line would run adjacent to the I-15, turning west towards the Proposed Ivanpah Substation north of the Primm Valley Golf Club. The line would terminate at the Proposed Ivanpah Substation. The land that Section 3-Alternative 2 runs through is managed by the BLM as VRM Class III (BLM 2008b).

The APMs listed for the proposed transmission line and the transmission line Alternatives A through E would apply to Telecommunication System Path 2.

Evaluation of the Telecommunication System Implementation

Telecommunication System Path 1

Path 1 would run from the Eldorado Substation, terminating at the Proposed Ivanpah Substation after following the same route as the transmission line route selected for the Proposed Project. Impacts associated with the construction, operation, and decommissioning of Path 1 are described under the impact evaluations for KOP 1 through KOP 8, detailed in Sections 4.1.4.2 and 4.1.4.3. As described in those sections, according to the BLM methodology, the changes to the existing environment would be consistent with the respective VRM class assignment. Therefore, implementation of Telecommunication System Path 1 would result in no adverse effect and mitigation would not be required.

Telecommunication System Path 2

Path 2 would run from the Eldorado Substation to the Proposed Ivanpah Substation; a detailed discussion of the route for Path 2 is located under the Existing Environment portion of this PEA section. Construction of Path 2 for the Proposed Project could be visible in Character Photographs 4 (Figure 4.1-13, located at the end of Section 4.1) and 5 (Figure 4.1-14, located at the end of Section 4.1). In Character Photographs 4 and 5, construction would result in short-term changes to the existing environment. Installation of Path 2 would result in temporary generation of fugitive dust that could be visible in these views under certain conditions. Large equipment, delivery trucks, and construction equipment would be present during construction, and movement of such vehicles could be visible.

Project operation would result in long-term changes to the existing environments of Character Photographs 4 and 5. Long-term changes would result from the addition of Path 2; changes to the existing environment would be barely visible to not visible in Character Photographs 4 and 5.

The impacts of Project decommissioning would be similar to those described for Project construction, including the generation of fugitive dust and the presence of work vehicles and heavy equipment. Measures to reduce airborne dust would minimize potential effects to the visual environment during Project decommissioning and would minimize potentially long-term effects to the visual environment.

Implementation of Path 2 in these views, including construction, operation, and decommissioning, would result in no change in the form, line, color, and texture of the land/water body, and vegetation in the existing environment. Construction, operation, and decommissioning would result in a weak change in the structures in the existing environment. The changes to the existing environment in Character Photograph 4 would be consistent with the VRM Class II assigned to these BLM-managed lands; changes to the environment in Character Photograph 5 would be consistent with the VRM Class III assigned to Nipton. Therefore, construction, operation, and decommissioning of Path 2 would result in no adverse effect and no mitigation would be required.

4.1.4.2 Impact Evaluation

Would the Project have a substantial adverse effect on a scenic vista?

<u>Construction Impacts</u>

Construction of the Proposed Project would not have a substantial adverse effect on a scenic vista, as there are no designated scenic vistas within the Project area or with a view of the Project area. Consequently, none of the elements of the Proposed Project (transmission line, transmission line alternatives, substations, and telecommunication system) would have the potential to have a substantial adverse effect on a scenic vista. Therefore, construction of the Proposed Project would result in no impact under this criterion and no mitigation would be required.

<u>Operation Impacts</u>

Operation of the Proposed Project would not have a substantial adverse effect on a scenic vista, as there are no designated scenic vistas within the Proposed Project area or with a view of the Proposed Project area. Consequently, none of the elements of the Proposed Project (transmission line, transmission line alternatives, substations, and telecommunication system) would have the potential to have a substantial adverse effect on a scenic vista. Therefore, operation of the Proposed Project would result in no impact under this criterion and no mitigation would be required.

Would the Project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

<u>Construction Impacts</u>

Construction of the Proposed Project would not have an adverse effect on a state designated scenic highway, as there are no designated state scenic highways within the Project area. Consequently, the Proposed Project would not have the potential to substantially damage scenic resources (including trees, rock outcroppings, and historic buildings) within a state scenic highway.

However, the portion of I-15 that extends roughly from the I-215 to the Nevada border is a San Bernardino County Designated Scenic Highway. Project elements that would be visible during construction from the county scenic highway include the proposed transmission line, Transmission Line Alternatives A through E, and the Proposed Ivanpah Substation. The discussion for KOPs 6 and 8 address the appearance of the Proposed Project from locations along I-15. As described in Section 4.1.4.1 for KOP 6, construction activity would be visible, but this activity would not dominate the view, nor would it damage scenic resources along the highway corridor.

Therefore, construction of the Proposed Project would result in no impact under this criterion and no mitigation would be required.

Operation Impacts

Operation of the Proposed Project would not have an adverse effect on a state designated scenic highway, as there are no designated state scenic highways within the Project area. Consequently, the Proposed Project would not have the potential to substantially damage scenic resources (including trees, rock outcroppings, and historic buildings) within a state scenic highway.

However, the portion of I-15 that extends roughly from the I-215 to the Nevada border is a San Bernardino County Designated Scenic Highway. Project elements that would be visible during operation from the county scenic highway include the proposed transmission line, transmission line Alternatives A through E, and the Proposed Ivanpah Substation. The discussions for KOPs 6 and 8 address the appearance of the Proposed Project from locations along I-15.

Figure 4.1-9b (located in Map Volume) shows the anticipated appearance of the Proposed Project from an elevated view along I-15 (KOP 8). As shown in this figure, the Proposed Ivanpah Substation would be visible in the background, but would represent a weak change to the existing environment, which is consistent with the VRM classification for the Project location.

Therefore, operation of the Proposed Project would result in no impact under this criterion and no mitigation would be required.

Would the Project substantially degrade the existing visual character or quality of the site and its surroundings?

Construction Impacts

Construction of the Proposed Project would not substantially degrade the existing character or quality of the site and its surroundings as discussed below.

Section 4.1.4.1 concludes that for all elements of the Proposed Project (transmission line, transmission line alternatives, substations, and telecommunication system), changes to the existing environment would be consistent with the respective VRM class assignment. To the extent feasible, existing access roads would be used (AES-5). Where new roads are required in the South McCullough Mountains to access new or existing transmission towers, road cuts would be treated by staining exposed rock to match the overall color of the adjacent weathered rock (AES-1), and road cuts would be treated by seeding and/or inter-planting into the disturbed areas to restore the area to an appearance that will blend back into the overall landscape context (AES-2). Widening and grading of roads would be kept to the minimum required for access by Proposed Project construction equipment (AES-6). Areas around new or rebuilt transmission structures that must be cleared during the construction process would be regraded and revegetated to restore the area to an appearance that would blend back into the overall landscape context (AES-4). Also, during the construction period, dust suppression measures would be used to minimize the creation of dust clouds potentially associated with the use of the access roads (AES-7).

Accordingly, the Proposed Project would not substantially degrade the existing visual character or quality of the site and its surroundings during construction. Therefore, construction of the

Proposed Project would result in a less than significant impact under this criterion and no mitigation would be required.

Operation Impacts

Operation of the Proposed Project would not substantially degrade the existing character or quality of the site and its surroundings.

Sections 4.1.4.1 concludes that for all elements of the Proposed Project (transmission line, transmission line alternatives, substations, and telecommunication system), long-term changes to the existing environment would be consistent with the respective VRM class assignment. To the extent feasible, existing access roads would be used (AES-5). Where new roads are required in the South McCullough Mountains to access new or existing transmission towers, road cuts would be treated by staining exposed rock to match the overall color of the adjacent weathered rock (AES-1) and road cuts would be treated by seeding and/or inter-planting into the disturbed areas to restore the area to an appearance that will blend back into the overall landscape context (AES-2). Areas around new or rebuilt transmission structures that must be cleared during the construction process would be regraded and revegetated to restore the area to an appearance that would blend back into the overall landscape context (AES-4).

Accordingly, the Proposed Project would not substantially degrade the existing visual character or quality of the site and its surroundings during operation. Therefore, operation of the Proposed Project would result in a less than significant impact under this criterion and no mitigation would be required.

Would the Project create a new source of light or glare that would adversely affect day or nighttime views in the area?

Construction Impacts

Construction of the Proposed Project would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. Nighttime construction requiring lighting is not anticipated to be required for the Proposed Project.

Therefore, construction of the Proposed Project would result in no impact under this criterion and no mitigation would be required.

Operation Impacts

Operation of the Proposed Project would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. LSTs and TSPs would be constructed of steel that is galvanized and treated at the factory to create a dulled finish that will reduce reflection of light off of the tower members. As appropriate to the environment, the galvanized coating would also be darkened to allow the towers to blend into the backdrops. Non-specular transmission cable would be installed for the new transmission line to minimize conductor reflectivity (AES-3).

Project facilities that may require nighttime lighting include the expanded Eldorado Substation and the Proposed Ivanpah Substation. Eldorado Substation is not illuminated at night under normal conditions; lighting would be used when required for nighttime emergency repairs.

Lighting required for the Proposed Ivanpah Substation would be a new source of lighting in an area that is currently undeveloped. However, under normal conditions, the Proposed Ivanpah Substation would not be illuminated at night; lighting would be used when required for nighttime emergency repairs. Lighting would consist of high-pressure sodium lights located in the switchracks, around the transformer banks, and areas of the yard where emergency activities may be required. The substation lighting would be designed to be controlled by switch so that it can be turned on only when required for nighttime emergency repairs. The lighting would be directed downward and shielded to eliminate off-site light spill at times when the lighting might be in use (AES-8). Because neither Eldorado Substation nor the Proposed Ivanpah Substation would use nighttime lighting during regular operation, the Proposed Project would not create a new source of light or glare that would adversely affect day or nighttime views in the area. Therefore, operation of the Proposed Project would result in a less than significant impact under this criterion and no mitigation would be required.

4.1.4.3 Mitigation Measures

Implementation of the Proposed Project would result in less than significant impacts during construction and operation; therefore, no mitigation is required.

4.1.4.4 Impact Significance after Mitigation

Implementation of the Proposed Project would result in less than significant impacts during construction and operation; therefore, no mitigation is required.

4.1.5 Evaluation and Comparison of Proposed and Alternative Transmission Line Routes and Alternative Telecommunications System Paths

Implementation of the proposed transmission line and the transmission line alternatives would result in no adverse effect under NEPA and a less than significant impact under CEQA. However, there are slight variations between the proposed transmission line and three of the transmission line alternatives that would affect sensitive receptors, described as follows. Additionally, Path 2 of the Telecommunications System has alternatives that may affect sensitive receptors, also described as follows.

4.1.5.1 Transmission Line Alternative A

With regard to potential construction and operation aesthetics impacts to sensitive receptors, Transmission Line Alternative A is similar to the Proposed Project. Therefore, implementation of Transmission Line Alternative A would result in no adverse effect under NEPA and a less than significant impact under CEQA.

4.1.5.2 Transmission Line Alternative B

With regard to potential construction and operation aesthetics impacts to sensitive receptors, transmission line Alternative B is similar to the Proposed Project. Therefore, implementation of transmission line Alternative B would result in no adverse effect under NEPA and a less than significant impact under CEQA.

4.1.5.3 Transmission Line Alternative C

With regard to potential construction and operation aesthetics impacts to sensitive receptors, transmission line Alternative C would relocate a portion of the transmission line away from the nearest sensitive viewer (KOP 4 - Desert Oasis Apartment Complex). The transmission line that is present at KOP 4 in the existing environment (Figure 4.1-5a, located in Map Volume) and that would be replaced for the Proposed Project (Figure 4.1-5b, located in Map Volume) would be removed and not replaced in this location for transmission line Alternative C. As a result, Transmission Line Alternative C would have a reduced aesthetics impact as compared to the proposed transmission line from KOP 4. However, implementation of both the proposed transmission line and transmission line Alternative C would result in no adverse effect under NEPA and a less than significant impact under CEQA.

4.1.5.4 Transmission Line Alternative D

With regard to potential construction and operation aesthetics impacts to sensitive receptors, Transmission Line Alternative D would relocate a portion of the transmission line away from the nearest sensitive viewer (KOP 4 - Desert Oasis Apartment Complex). The transmission line that is present in KOP 4 in the existing environment (Figure 4.1-5a, located in Map Volume) and that would be replaced for the Proposed Project (Figure 4.1-5b, located in Map Volume) would be removed and not replaced in this location for Transmission Line Alternative D.

Transmission line Alternative D would result in the transmission line visible in KOP 5 being closer to the recreational viewer from Ivanpah Lake. However, a simulation prepared for transmission line Alternative D from KOP 5 (Figure 4.1-6b, located in Map Volume) shows that transmission line Alternative D would not be substantially more prominent in the view than the proposed transmission line.

Transmission line Alternative D would have a reduced impact as compared to the proposed transmission line. However, both the proposed transmission line and transmission line Alternative D would result in no adverse effect under NEPA and a less than significant impact under CEQA.

4.1.5.5 Transmission Line Alternative E

With regard to potential construction and operation aesthetics impacts to sensitive receptors, Transmission Line Alternative E would relocate a portion of the transmission line away from the nearest sensitive viewer (KOP 4 - Desert Oasis Apartment Complex). The transmission line that is present in KOP 4 in the existing environment (Figure 4.1-5a, located in Map Volume) and that would be replaced for the Proposed Project (Figure 4.1-5b, located in Map Volume) would be removed and not replaced in this location for Transmission Line Alternative E.

Transmission line Alternative E would result in the transmission line visible in KOP 5 being closer to the recreational viewer from Ivanpah Lake. However, a simulation prepared for transmission line Alternative D from KOP 5 (Figure 4.1-6b, located in Map Volume) shows that the transmission line Alternative E would not be substantially more prominent in the view than the proposed transmission line.

Transmission line Alternative E would have a reduced impact as compared to the proposed transmission line. However, both the proposed transmission line and transmission line Alternative E would result in no adverse effect under NEPA and a less than significant impact under CEQA.

4.1.5.6 Telecommunication System Path 2-Section 3

At the junction of Highway 164 with I-15, Path 2-Section 3 of the Telecommunications System splits into two alternatives. Alternative 1 continues westward along Highway 164, then northwest to the Mountain Pass Substation and northeast to the Proposed Ivanpah Substation. Alternative 2 runs adjacent to the I-15, turning west towards the Proposed Ivanpah Substation north of the Primm Valley Golf Club. Because Path 2-Section 3-Alternative 2 runs adjacent to the I-15 and the Primm Valley Golf Club, it is likely to have more viewers then Path 2-Section 3-Alternative 1. Consequently, Alternative 1 would have a reduced impact as compared to Alternative 2. However, both Alternative 1 and Alternative 2 for Path 2-Section 3 of the Telecommunications System would result in no adverse effect under NEPA and a less than significant impact under CEQA.

4.1.6 <u>References</u>

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FIGURE 4.1-10. CHARACTER PHOTO 1

Character Photo 1 - View from a dirt road west of the city of Primm looking southeast toward the Existing and Proposed Transmission Line.

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FIGURE 4.1-10. CHARACTER PHOTO 1

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FIGURE 4.1-11. CHARACTER PHOTO 2

Character Photo 2 - View from the Dry Lake west of Highway 95, looking southwest toward the Eldorado Substation.

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FIGURE 4.1-12. CHARACTER PHOTO 3

Character Photo 3 - View from the Primm Valley Golf Club looking west toward the site of the Proposed Ivanpah Substation.

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FIGURE 4.1-13. CHARACTER PHOTO 4

Character Photo 4 - View from Highway 164 looking northeast toward a portion of the Proposed Telecommunication System.

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FIGURE 4.1-13. CHARACTER PHOTO 4

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FIGURE 4.1-14. CHARACTER PHOTO 5

Character Photo 5 - View from Highway 164 looking east toward Nipton, California, adjacent to a portion of the Proposed Telecommunication System.

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4.2 AGRICULTURE RESOURCES

This section contains a description of existing conditions and the potential agricultural resource impacts associated with the construction and operation of the Proposed Project and alternatives.

4.2.1 Regulatory Setting

4.2.1.1 Federal

The Farmland Protection Policy Act (FPPA) is intended to minimize the impact that federal programs have on the unnecessary and irreversible conversion of farmland to non-agricultural uses. It assures that, to the extent possible, federal programs are administered to be compatible with state and local government, and private programs and policies to protect farmland. Federal agencies are required to develop and review their policies and procedures in order to implement the FPPA every 2 years. For the purpose of the FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance (FPPA 1981).

The U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) has established classifications for notable agricultural lands based on criteria for soil characteristics, climatic conditions, and water supply. Notable agricultural lands are classified as follows:

- Prime Farmland: land that has the best combination of physical and chemical properties for the production of crops
- Unique Farmland: land of lesser quality soils, but recently used for the production of specific, high economic value crops
- Farmland of Statewide Importance: similar to Prime Farmland, but with minor shortcomings (e.g., steeper slopes, inability to hold water)

The USDA NRCS has mapped soils within San Bernardino County, California and Clark County, Nevada (NRCS 2007).

4.2.1.2 State

The California Department of Conservation (CDC) established the Farmland Mapping and Monitoring Program (FMMP) in 1982 to assess the location, quantity, and quality of agricultural lands and the conversion of these lands to other uses. Every even-numbered year, FMMP issues a Farmland Conversion Report. The CDC FMMP identifies and designates lands that are prime farmland, unique farmland, or farmland of statewide importance. FMMP data is used in elements of some county and city general plans and associated environmental documents as a way of assessing project impacts on farmland and, in regional studies, for assessing impacts due to agricultural land conversion (CDC 2006).

The California Legislature passed the California Land Conservation Act (Williamson Act) in 1965 to preserve agricultural and open-space lands by discouraging premature and unnecessary conversion to urban uses. The CDC oversees agricultural lands protected by the Williamson Act. According to the law, a landowner enters into a contract, agreeing to protect the land's open space or agricultural uses in order to receive reduced property taxes (California Land Conservation Act 1965).

4.2.1.3 Local

The following local plans were reviewed:

- County of San Bernardino 2007 General Plan: outlines standards and policy for unincorporated territory within San Bernardino County, California (County of San Bernardino 2007)
- Clark County Comprehensive Plan: outlines standards and policy for unincorporated territory within Clark County, Nevada (County of Clark 2008)
- Boulder City Master Plan: includes goals, policies, and programs used in making land use decisions for the future of the City of Boulder City, Nevada (Boulder City 2003)

4.2.2 Significance Criteria and Approach to Impact Assessment

4.2.2.1 Significance Criteria

Impacts on agricultural resources are considered potentially significant if the Project would:

- convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the FMMP of the California Resources Agency, to non-agricultural use
- conflict with existing zoning for agricultural use, or a Williamson Act contract
- involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use

4.2.2.2 Applicant Proposed Measures

No APMs for agricultural resources are proposed.

4.2.2.3 Approach to Impact Assessment

The assessment of potential impacts on agricultural resources was conducted to address the CEQA significance criteria (see list above). The impact assessment was conducted to identify the type and extent of potential impacts on agricultural uses by the Proposed Project and alternatives. The potential for impacts was evaluated within the Project area, which is defined as the area within a radius of approximately 0.5 mile of the Proposed Project facilities and alternatives.

4.2.3 Environmental Setting

The environmental setting section includes a description of the agricultural land uses in the study area for the Proposed Project. The regional setting section includes a general description of the portion of Clark and San Bernardino counties that is shown in Figures 4.9-1 and 4.9-2 (located in Map Volume). The local setting is specific to the Proposed Project area and within the study area described as the regional setting.

Information was obtained directly from maps and the interpretation of aerial photographs, and from secondary sources which include agency plans and other documents.

4.2.3.1 Regional Setting

As shown in Figures 4.9-1 and 4.9-2 (located in Map Volume), the proposed Eldorado-Ivanpah Transmission Project area is located in San Bernardino County, California and Clark County, Nevada. The general area, within the Mojave Desert, is composed of basin and range landscape that contains dry lakes (Fenneman 1931). The majority of the Proposed Project area is under federal jurisdiction, managed by the BLM and designated for multiple purposes, including open space, grazing, and conservation.

4.2.3.2 Local Setting

Based on a review of aerial imagery, there are no farmlands located within the Proposed Project area. According to the NRCS, there are no lands designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance within the Project area or on lands occupied by the existing or proposed substations associated with the Proposed Project. The CDC FMMP maps show the Proposed Project area as lands without designation. Additionally, the Proposed Project components are not located on lands zoned for agricultural use (Smith 2009). According to Clark County and San Bernardino County zoning maps, there are lands zoned for open space allowing for agriculture, but not designated as agriculture. Agricultural uses are not designated in Clark County, San Bernardino County, or Boulder City future land use plans. According to CDC maps, there are no lands subject to Williamson Act contracts that would be affected by the Proposed Project or alternatives (CDC 2009).

Information on grazing allotments was obtained from the BLM's and U.S. Forest Service's (USFS) National Integrated Land System (NILS), which provides access through the Geocommunicator. The interactive maps provide searching, accessing, and dynamic mapping of several BLM land uses, including range allotments and pastures and allotment reports (NILS 2008). Portions of public land in the Proposed Project area are allotted for grazing under the guidance of an applicable land use plan for livestock grazing; this is provided for in an allotment under permit or lease. The Proposed Project crosses 10 grazing allotments which include: Clark Mountain, Crescent Peak, Jean Lake, Kessler Springs, Valley View, and Valley Wells of

California; and Crescent Peak, Jean Lake, McCullough Mountain, and Roach Lake of Nevada. The Clark Mountain, Kessler Springs, Valley View, and Valley Wells allotments are active, comprising permits for grazing 1,176 cattle, at the rate of approximately 400 acres to over 8,000 acres per animal unit. According to the BLM, the Nevada allotments (Crescent Peak, Jean Lake, McCullough Mountain, and Roach Lake), as well as Crescent Peak and Jean Lake of California, do not currently maintain an authorized permit (Bertola 2009).

4.2.4 Environmental Impacts and Mitigation Measures

Transmission Line, Telecommunications, and Substations - Construction and Operation Impact

Impact Analysis

Would the Project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the FMMP of the California Resources Agency, to non-agricultural use?

Construction and operation of all components of the Proposed Project would not result in the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use. There are no agricultural lands established with these classifications and therefore there would be no impacts.

Would the Project conflict with existing zoning for agricultural use, or a Williamson Act contract?

The Proposed Project and alternatives would not cause potential conflicts with land zoned for agricultural use or land subject to Williamson Act contracts, because agricultural zoning and Williamson Act contracts do not exist in the Project area. During construction and operation of the Proposed Project, there would be no impacts.

Would the Project involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to non-agricultural use?

The Proposed Project would not involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to non-agricultural use. There is no agriculture in the Project area.

The Proposed Project would not substantially block access, limit vegetation, or restrict movement of cattle within active livestock grazing units. Therefore, the effects of construction and operation of the Proposed Project to cattle grazing would be short-term and minimal, and result in less than significant impacts.

Mitigation Measures

Because there would be no agricultural impacts resulting from construction and operation of the Proposed Project and alternatives, no mitigation measures would be needed.

4.2.5 Evaluation and Comparison of Proposed Routes and Alternatives

According to CEQA significance criteria, the proposed Eldorado-Ivanpah Transmission Project would have no impact on agricultural use. Alternatives A, B, C, D, and E and the Proposed Route of the 220kV Transmission Line would not result in adverse impacts on agriculture. The Telecommunications Facilities and alternatives 1 and 2 would have no impact. Impacts on agricultural resources would therefore be the same for the Proposed Project and the alternatives.

4.2.6 References

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4.3 AIR QUALITY

This section of the PEA identifies existing air quality standards within the Project study area and assesses potential air quality impacts that may result from Project construction and operation. Also included in this section is a summary of federal, state, and local laws and regulations associated with the protection and management of air quality.

Implementation of the Project may result in potential air quality impacts during construction and operations. During Project construction, on-site operation of heavy-duty construction equipment would generate emissions of vehicle exhaust containing pollutants such as carbon monoxide (CO), nitrogen oxide (NO_X), reactive organic gas (ROG), sulfur oxide (SO_X), particulate matter less than 10 micrometers in aerodynamic diameter (PM_{10}), and particulate matter less than 2.5 micrometers in aerodynamic diameter ($PM_{2.5}$). Earth-moving activities would generate emissions of PM_{10} and $PM_{2.5}$ as fugitive dust. Off-site vehicle trips made by employees and delivery trucks would generate additional vehicle exhaust emissions.

After analysis it was determined that, when compared to thresholds of significance established by the Mojave Desert Air Quality Management District (MDAQMD), the construction emissions are below the MDAQMD air quality significance thresholds and the localized significance thresholds. The air quality impacts associated with Project construction, therefore, would be temporary and less than significant.

Additionally, potential air quality impacts during Project operations would be associated with the vehicle emissions from routine maintenance activities, and are expected to be minimal. Air quality impacts directly associated with operation of the Project, therefore, would be intermittent and less than significant.

4.3.1 <u>Regulatory Setting</u>

Federal Clean Air Act and Amendments. These statutes provide the Environmental Protection Agency (EPA) with the authority to set ambient air quality standards and grant a waiver for California to set stricter standards. The EPA also requires a State Implementation Plan that outlines the state regulations and programs that will be implemented to demonstrate how a state will attain or maintain the ambient air quality standards within a given period of time. Through the Clean Air Act, as most recently amended in 1990, the EPA also implements on- and off-road engine emission reduction programs that periodically phase in engine efficiency requirements and/or ancillary engine or exhaust equipment that result in cleaner emissions from on- and off-road equipment. EPA Region 9, which has its offices in San Francisco, administers federal air programs in California and Nevada.

California and Nevada Air Quality Statutes. Through California statutes, the California Air Resources Board (CARB) is given the authority to develop ambient air quality standards for the state. The CARB also implements the Off-road Mobile Sources Emission Reduction Program to reduce emissions from off-road equipment, and the Portable Equipment Registration Program, a program that evaluates portable equipment and provides a registry for qualifying equipment to be exempt from obtaining separate air quality permits to operate within each individual air basin.

MDAQMD and Department of Air Quality and Environmental Management (DAQEM) have been delegated the responsibility to develop implementation plans for meeting ambient standards and the authority to establish local emission standards and limitations. MDAQMD Rule 403 Fugitive Dust is applicable to the California activities and includes the following restrictions:

- Fugitive dust cannot remain visible in the atmosphere beyond the property line of the emission source.
- Reasonable precaution must be taken to minimize fugitive dust emissions from construction activities.
- Reasonable precaution must be taken to prevent visible particulate matter from being deposited upon public roadways as a direct result of the construction operations. Reasonable precautions shall include, but are not limited to, the removal of particulate matter from equipment prior to movement on paved streets or the prompt removal of any material from paved streets onto which such material has been deposited.

DAQEM rule Section 94 – Permitting and Dust Control for Construction Activities requires construction projects of this magnitude to obtain a Dust Control Permit and prepare a Dust Mitigation Plan. The DAQEM fugitive dust rule is more prescriptive than the MDAQMD rule, but both result in minimum fugitive dust emissions from the construction activities.

4.3.2 Significance Criteria and Approach to Impact Assessment

4.3.2.1 Significance Criteria

The significance criteria for assessing the impacts to air quality come from the CEQA Environmental Checklist. According to the CEQA Checklist, a project causes a potentially significant impact if it would:

- conflict with or obstruct implementation of the applicable air quality plan
- violate any air quality standard or contribute substantially to an existing or projected air quality violation
- result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)
- expose sensitive receptors to substantial pollutant concentrations
- create objectionable odors affecting a substantial number of people

4.3.2.2 Applicant Proposed Measures

No APMs for air quality resources are proposed.

4.3.2.3 Approach to Impact Assessment

Air quality impacts resulting from the construction or operation of the Proposed Project are deemed significant if daily emission estimates are above the following significance emission thresholds published by the MDAQMD in their CEQA guidelines (Table 4-4) (MDAQMD 2008):

TABLE 4-4
EMISSION THRESHOLDS

Criteria Pollutant	Annual Threshold (tons)	Daily Threshold (pounds)
CO	100	548
NO_x	25	137
Volatile Organic Compounds (VOC)	25	137
SO_x	25	137
PM_{10}	15	82
Source: MDAQMD 2008.		

4.3.3 Environmental Setting

The California section of the Proposed Project lies within the easternmost portion of the Mojave Desert Air Basin, a region that is comprised of portions of Los Angeles, Kern, San Bernardino, and Riverside counties. The Nevada section lies within southern Clark County. The southern portion of the Proposed Project originates in the Ivanpah Valley south of the stateline, crosses the McCullough Range, and terminates in the Eldorado Valley south of Boulder City.

The climate is desert. The cool, moist coastal air is blocked by the San Gabriel and San Bernardino mountain ranges. The area is characterized by hot, dry summers and mild winters with annual rainfall averaging 2 to 5 inches per year. In the summer, the study area is usually influenced by a Pacific Subtropical high cell that sits off the coast of California. The prevailing winds are out of the west and south.

Wind speed and direction are key factors influencing the dispersion and transport of pollutants. At the nearest meteorological monitoring site in Jean, Nevada, the most frequent wind direction is from the west-southwest. Wind speeds average approximately 5.0 miles per hour. Air pollutants can be routinely channeled between the Ivanpah and Las Vegas valleys.

Average daily temperatures in the Project area range from 39 degrees Fahrenheit in December and January to 79 degrees Fahrenheit in July. Summer daily maximum temperatures often exceed 100 degrees Fahrenheit at lower elevations. Relative humidity in the Mojave Desert is typically 10 percent on summer afternoons and 30 percent on winter afternoons. Table 4-5 lists the average precipitation data for the Mojave Desert Air Basin.

TABLE 4-5 PRECIPITATION AND EVAPORATION IN MDAQMD				
Location	**Precipitation (inches)**	**Precipitation (days)**	**Evaporation (inches)**	**Length of Observations (years)**
Trona	3.8	16	NA	48
Randsburg	5.9	23	NA	48
China Lake	4.4	NA	NA	34
Goldstone Echo	5.4	20	NA	23
Daggett Airport	3.9	23	NA	48
Barstow Fire	4.6	23	NA	16
Barstow CIMIS	5.3	27	72	18
Granite Mountain	5.8	22	NA	5
Victorville CIMIS	7.5	27	65	11
Mitchell Caverns	10.4	32	NA	38
Mountain Pass	7.6	28	NA	41
Parker Reservoir	5.4	24	NA	48
Needles Airport	4.6	23	NA	48
Twentynine Palms	4.0	19	NA	48
Blythe Airport	3.6	17	NA	48
Iron Mountain	3.4	19	NA	48
Source: MDAQMD 2008				

The Proposed Project is in a region under the jurisdiction of the MDAQMD and the Clark County Board of County Commissioners (CCBCC), which has delegated the air quality planning responsibilities to the DAQEM. The MDAQMD and DAQEM adopt and enforce rules and regulations to achieve state and federal ambient air quality standards, and enforce applicable state and federal laws.

The federal Clean Air Act of 1970 required the EPA to adopt ambient air quality standards. The National Ambient Air Quality Standards (NAAQS) are the maximum levels, given a margin of safety, of air pollution that is considered safe for public health and welfare. Air quality standards developed by individual states must be at least as stringent as those set forth by the EPA. The CARB has developed California Ambient Air Quality Standards (CAAQS). Nevada does not have air quality standards that are different from the NAAQS.

Areas that fail to meet federal NAAQS (and CAAQS) are identified as nonattainment areas. When an area is designated as nonattainment, regional air quality management agencies are required to develop detailed plans that will lower the emissions of pollutants in order to reach attainment, and sources of pollutants are typically subject to more stringent air permitting requirements than similar sources in attainment areas.

Presently, the ambient air in the area of the Proposed Project is classified by the CARB as nonattainment for ozone (O_3) and PM_{10}. The ambient air in the area is either unclassified or classified as attainment for all other state-regulated air pollutants. The attainment status of each CAAQS and NAAQS pollutant is shown in Table 4-6, Ambient Air Quality Standard Attainment Status of Mojave Desert Air Basin and Clark County.

TABLE 4-6 AMBIENT AIR QUALITY STANDARD ATTAINMENT STATUS OF MOJAVE DESERT AIR BASIN AND CLARK COUNTY				
		Mojave Desert		Clark County
Pollutant	Averaging Time	CAAQS	NAAQS	NAAQS
O_3	1-hour	Nonattainment	No NAAQS	No NAAQS
	8-hour	Nonattainment	Attainment	Nonattainment
CO	1-hour	Attainment	Attainment	Nonattainment
	8-hour	Attainment	Attainment	Nonattainment
Nitrogen Dioxide (NO_2)	Annual Average	No CAAQS	Attainment	Attainment
	1-hour	Attainment	No NAAQS	No NAAQS
Sulfur Dioxide ($S0_2$)	Annual Average	No CAAQS	Attainment	Attainment
	24-hour	Attainment	Attainment	Attainment
	3-hour	No CAAQS	Attainment	Attainment
	1-hour	Attainment	No NAAQS	No NAAQS
Respirable Particulate Matter PM_{10}	Annual Averag	Nonattainment	No NAAQS	No NAAQS
	24-hour	Nonattainment	Nonattainment	Nonattainment
Fine Particulate Matter $PM_{2.5}$	Annual Average	Unclassified	Attainment	Attainment
	24-hour	No CAAQS	Attainment	Attainment
Sulfates	24-hour	Attainment	No NAAQS	No NAAQS
Lead	30 days	Attainment	No NAAQS	No NAAQS
	Quarter	No CAAQS	Attainment	Attainment
Hydrogen Sulfide	1-hour	Unclassified	No NAAQS	No NAAQS
Vinyl Chloride	24-hour	Unclassified	No NAAQS	No NAAQS
Visibility Reducing Particles	8-hour	Unclassified	No NAAQS	No NAAQS
SOURCE: USEPA 2008				

The NAAQS and CAAQS are summarized in Table 4-7 and represent safe levels of each pollutant to avoid specific adverse effects to human health and the environment.

TABLE 4-7 AMBIENT AIR QUALITY STANDARDS				
		California	National Standards[b]	
Pollutant	Averaging Time	Standards[a]	Primary[c]	Secondary[d]
O_3	8 Hours	0.07 ppm [e]	0.075 ppm	0.075 ppm
	1 Hour	0.09 ppm	— [f]	— [f]
CO	8 Hours	9.0 ppm	9 ppm	—
	1 Hour	20 ppm	35 ppm	—
NO_2	Annual Average	0.03 ppm	0.053 ppm	0.053 ppm
	1 Hour	0.18 ppm	—	—
$S0_2$	Annual Average	—	0.030 ppm	—
	24 Hours	0.04 ppm	0.14 ppm	—
	3 Hours	—	—	0.5 ppm
	1 Hour	0.25 ppm	—	—
$PM_{2.5}$	Annual Geometric Mean	12 $\mu g/m^3$	15 $\mu g/m^3$	15 $\mu g/m^3$
	24 Hours	—	35 $\mu g/m^3$	35 $\mu g/m^3$
PM_{10}	Annual Arithmetic Mean	20 $\mu g/m^3$	—	—
	24 Hours	50 $\mu g/m^3$	150 $\mu g/m^3$	150 $\mu g/m^3$
Lead	30-Day Average	1.5 $\mu g/m^3$	—	—

TABLE 4-7 AMBIENT AIR QUALITY STANDARDS				
Pollutant	**Averaging Time**	**California**	**National Standards**[b]	
	Calendar Quarter	—	1.5 $\mu g/m^3$	1.5 $\mu g/m^3$
Sulfates	24 Hours	25 $\mu g/m^3$	—	—
Hydrogen Sulfide	1 Hour	0.03 ppm	—	—
Vinyl Chloride	24 Hours	0.010 ppm	—	—

Notes:

[a]California standards for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, PM_{10}, $PM_{2.5,}$ and visibility-reducing particles are values that are not to be exceeded. The standards for sulfates, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded.

[b]National standards, other than ozone and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than 1.

[c]National Primary Standards represent the levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[d]National Secondary Standards represent the levels of air quality necessary to protect the environment, including public welfare, from any known or anticipated adverse effects of a pollutant.

[e]On June 15, 2005, the 1-hour ozone standard of 0.12 part per million was revoked for all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) areas. (Those areas do not yet have an effective date for their 8-hour designations.)

[f]A sufficient amount to produce an extinction coefficient of 0.23 per km due to particles when the relative humidity is less than 70 percent.

ppm parts per million by volume

$\mu g/m^3$ micrograms per cubic meter

Source: CARB 2008, http://www.arb.ca.gov/research/aaqs/aaqs2.pdf

Ambient air quality is monitored at several locations in Pahrump, Las Vegas, Barstow, Trona, and other stations. However, the data from these areas are not useful as background data for the study area due to the distance from the Proposed Project and the influence of local sources. An air monitoring site is located in Boulder City, Nevada, approximately 15 miles from the northern end of the subtransmission line. This site has been in operation since May 2007, monitoring O_3 and PM_{10}. It is also not considered to be representative of the study area. There is only one ambient air quality monitoring site that is considered to be representative of the rural study area. It is located 6.0 miles from the Proposed Project in Jean, Nevada and has been in operation since March 2007. Only a few months of O_3, PM_{10}, and $PM_{2.5}$ data are available, and validated data are not yet available. The preliminary 2008 data for the Jean site indicates that the maximum 1-hour ozone concentration for the year was 87 parts per billion (ppb) and the second highest value was 85 parts per billion (ppb). The PM_{10} preliminary 2008 data indicates that the maximum 1-hour concentration was 993 ug/m3, the second highest was 671 ug/m3 and the annual average was 12 ug/m3. The $PM_{2.5}$ preliminary 2008 data indicates that the maximum 1-hour concentration was 174 ug/m3, the second highest was 130 ug/m3 and the annual average was 12 ug/m3.

Greenhouse Gases

GHGs that may contribute to global climate change include water vapor, carbon dioxide (CO_2), several trace gases, and aerosols. Currently, man-made (anthropogenic) emissions are regulated in California for the following gases: CO_2, methane (CH_4), nitrous oxide, hydrofluorocarbons, perfluorocarbons, and SF_6.

Anthropogenic emissions of CO_2 in developed countries occur largely from combustion of fossil fuels. In California, 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 nitrous oxide (N_2O) are also tracked, but occur in much smaller quantities. When quantifying GHG emissions, the different global warming potentials of GHG pollutants are usually taken into account by normalizing their rates to an equivalent CO_2 emission rate (CO_2 Eq.).

Statewide emissions of GHGs from relevant source categories in 1990 and later years are summarized in Table 4-8.

TABLE 4-8
CALIFORNIA GREENHOUSE GAS EMISSIONS (MILLION METRIC TONS CO_2 EQ.)*

Emission Inventory Category	1990	2000	2001	2002	2003	2004
Residential Fuel Combustion (CO_2)	29	30	27	27	26	28
Commercial Fuel Combustion (CO_2)	13	16	12	18	15	12
Industrial Fuel Combustion (CO_2)	66	76	80	72	65	67
Transportation Fuel Combustion (CO_2)	161	182	182	190	181	188
Electricity Generation, In-State (CO_2)	43	56	61	48	46	55
Elec. Generation Subtotal, Natural Gas (CO_2)	36	50	55	42	41	49
Elec. Generation Subtotal, Coal (CO_2)	2	2	2	2	2	3
Elec. Generation Subtotal, Petroleum (CO_2)	5	4	4	3	3	4
Methane (all CH_4 shown as CO_2 Eq.)	26	26	27	27	27	28
Nitrous Oxide (all N_2O shown as CO_2 Eq.)	33	31	31	34	34	33
Electricity Transmission and Distribution (SF_6 shown as CO_2 Eq.)	2	1	1	1	1	1
Total California Greenhouse Gas Emissions without Electricity Imports	**390**	**440**	**446**	**445**	**423**	**439**
Electricity Imports (CO_2 Eq.)	43	40	47	52	56	61
Total California Greenhouse Gas Emissions with Electricity Imports	**433**	**481**	**494**	**497**	**480**	**500**

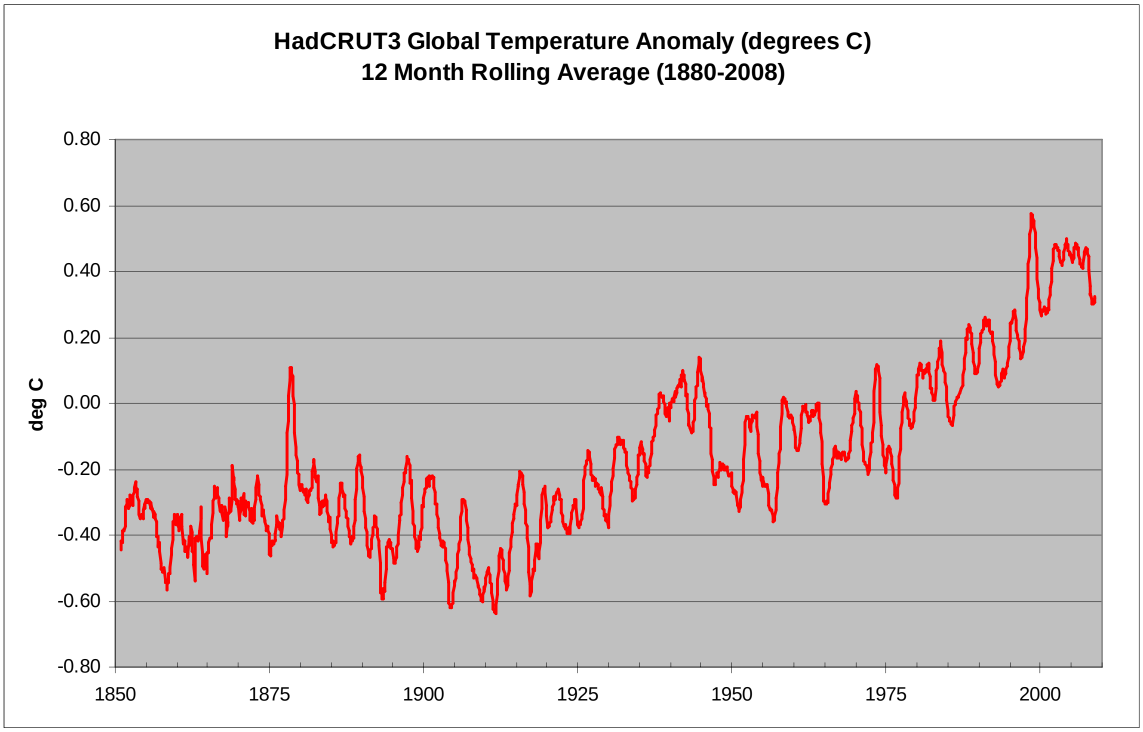
*Source: California Energy Commission 2007. (Totals include source categories not shown. Data reflect changes in memo from CEC to CARB dated January 23, 2007.)

California's anthropogenic GHG emissions are a small fraction of the world's total anthropogenic emissions, and are relatively minor when compared to estimates of naturally occurring CO_2 emissions.

Atmospheric CO_2 concentrations are the result of natural and anthropomorphic sources and natural sinks such as the oceans and plant photosynthesis. Ice cores have been used to estimate historical CO_2 levels. Continuous atmospheric measurements with sophisticated instrumentation have only been available since 1954. The ice core data indicates that CO_2 levels may have been 10 or 20 times higher in the geologic past than in the present. CO_2 periodically cycled between 200 and 300 ppm during the last 400,000 years. However, during the past 50 years, the CO_2 has increased to 390 ppm as measured by instruments in Hawaii. Present levels are much lower than during most of the world's history. However, CO_2 is estimated to be much higher today than it has been for several thousand years.

Historic global temperatures are difficult to estimate and much debate has occurred regarding methodologies that have been used. However, it is widely accepted that the global temperatures have cycled periodically much hotter and much colder than the present conditions. As recently as 1,000 years ago, the Medieval Warm Period was probably much warmer than today. Only 500 years ago, the Little Ice Age was probably much cooler than today. Monthly global atmospheric temperature has been estimated by the Met Office Hadley Centre from numerous temperature monitoring sites for data collected since 1850. Figure 4.3-1 shows the estimated global temperature anomaly (deviation from a mean temperature) for the past 158 years (raw data downloaded from HadCRUT3 database). CO_2 increased approximately 100 ppm over that period. For the past 11 years (1998 through 2008) the global temperatures have remained stable but higher than the previous 150 years. During the past 11 years the CO_2 has increased approximately 20 ppm.

Figure 4.3-1



Source: Met Office Hadley Centre 2009

4.3.4 Environmental Impacts and Mitigation Measures

The purpose of the MDAQMD CEQA guidelines is to provide lead agencies, consultants, and Project applicants with a framework and uniform methods for preparing air quality evaluations for environmental documents. The guidelines recommend specific criteria and threshold levels for determining whether a proposed project may have a significant adverse air quality impact. Although these are guidelines only, and their use is not required or mandated by the MDAQMD, they are considered appropriate for evaluating potential air quality impacts from the Proposed Project, since the California portion is located in MDAQMD.

Construction and operation of the Proposed Project would not produce impacts for the following CEQA criteria:

Would the Project conflict with or obstruct implementation of the applicable air quality plan?

Construction Impacts

Construction of the Proposed Project would not conflict with or obstruct implementation of the applicable air quality plan. Air quality plans are strategies designed to reduce long-term operational emissions and comply with the federal and state ambient air quality standards. The MDAQMD and DAQEM have adopted a series of attainment plans for criteria pollutants. The most current plan for MDAQMD was adopted April 26, 2004 and January 21, 2005 for DAQEM.

Applicable plans include emission budgets from off-road equipment, such as construction equipment and fugitive dust. The emissions associated with the Proposed Project construction would be temporary, lasting only a few months. The amount of the emissions would be negligible, compared to the regional emission inventory included in the plans, and thus is not expected to contribute significant burden to the regional emission budget. In addition, construction of the Project would be in compliance with the applicable CARB, MDAQMD, and DAQEM regulations and required emission controls, and is thus consistent with the plan strategy. Therefore, construction of the Proposed Project would result in a less than significant impact under this criterion.

Operational Impacts

Operation of the Proposed Project would not conflict with or obstruct implementation of the applicable air quality plan. Operation emissions are considered to be negligible because the primary sources of emissions would be from maintenance vehicles used by workers to patrol the transmission lines and visit the substation. Therefore, operation of the Proposed Project would result in a less than significant impact under this criterion.

Would the Project violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Construction Impacts

Construction of the Proposed Project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation. Construction emissions include emissions from equipment used during site preparation and Project construction. These activities would involve the use of diesel- and gasoline-powered equipment that would generate emissions of criteria pollutants such as CO, NO_X, ROG, SO_X, PM_{10}, and $PM_{2.5}$. Emissions of NO_X and ROG would contribute to the formation of O_3, and NO_X would also contribute to the formation of $PM_{2.5}$.

To determine whether implementation of the Proposed Project would violate any air quality standards or contribute substantially to an existing or projected air quality violation, a worst-case scenario approach was taken to estimate the construction emissions, and to ensure that all potential air quality impacts were assessed. As such, emissions occurring during construction activities were quantified and used to determine air quality impacts. Detailed assumptions and calculations are in Appendix D. The Proposed Project construction estimated emissions are presented in Table 4-9.

As shown in Table 4-9, the construction emissions of all criteria pollutants would be below the MDAQMD air quality significance thresholds. Additionally, the Proposed Project construction activities would be in compliance with MDAQMD fugitive dust rule 403. Therefore, construction of the Proposed Project would result in a less than significant impact under this criterion.

TABLE 4-9
MAXIMUM ANNUAL CONSTRUCTION EMISSIONS

Criteria Pollutant	Total Activity Emissions (tons)	California Activity Emissions (tons)	Annual Threshold (tons)	Above Threshold?
CO	26	7	100	No
NO_x	49	13	25	No
VOC	6	2	25	No
SO_x	0	0	25	No
PM_{10}	49	12	15	No

Operational Impacts

Operation of the Proposed Project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation. Operation emissions would be associated with the maintenance vehicles traveling along the transmission line during routine maintenance and visits to the substation. There are no other anticipated emissions from Project operation. Therefore, operation of the Proposed Project would result in a less than significant impact under this criterion.

Would the Project result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Construction Impacts

Construction of the Proposed Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard. Projects that do not exceed the significance thresholds are generally not considered to be cumulatively significant. As shown in Table 4-9, the construction emissions of the non-attainment pollutants (PM_{10}, $PM_{2.5}$, and ozone precursors [NO_x and VOCs]), would be less than the MDAQMD significance thresholds. Therefore, the cumulative impact from the Proposed Project construction would be less than significant.

Operational Impacts

Operation emissions would be associated with the maintenance vehicles traveling along the transmission line during routine maintenance and visits to the substation. There are no other anticipated criteria pollutant emissions from Project operation. These activities would not result in a cumulative considerable net increase of O_3 precursors or particulate matter. Impacts would be less than significant.

Would the Project expose sensitive receptors to substantial pollutant concentrations?

Construction Impacts

MDAQMD considers residences, schools, daycare centers, playgrounds, and medical facilities as sensitive receptor land uses. The following project types proposed for sites within the specified distance to an existing or planned (zoned) sensitive receptor land use must be evaluated using MDAQMD significance threshold criteria:

- any industrial project within 1,000 feet
- a distribution center (40 or more trucks per day) within 1,000 feet
- a major transportation project (50,000 or more vehicles per day) within 1,000 feet
- a dry cleaner using perchloroethylene within 500 feet
- a gasoline dispensing facility within 300 feet

Construction of the Proposed Project would be considered an industrial project and there are no sensitive receptors within 1,000 feet of the construction activities within the MDAQMD. Fugitive dust would minimized by adherence to applicable MDAQMD and DAQEM rules and regulations. As a result, the exposure of sensitive receptors to substantial pollutant concentrations would be less than significant.

Operational Impacts

Operation of the Proposed Project would not expose sensitive receptors to substantial pollutant concentrations. Operation emissions would include vehicle emissions from periodic inspection, maintenance, and repair of the proposed substation and subtransmission line. Therefore, operation of the Proposed Project would result in a less than significant impact under this criterion.

Would the Project create objectionable odors affecting a substantial number of people?

Construction Impacts

Construction of the Proposed Project would not create objectionable odors affecting a substantial number of people. SCE will use diesel construction equipment, which emits a distinctive odor that may be considered offensive to certain individuals. These odors would be temporary and would not affect a substantial number of people. Therefore, construction of the Proposed Project would result in a less than significant impact under this criterion.

Operational Impacts

Operation of the Proposed Project would not create objectionable odors affecting a substantial number of people. The operation of the substation is not expected to have odorous emissions. The substation equipment would be enclosed within the fenced property and away from all sensitive receptors. If there is any odor emitted from the maintenance activities, it would most likely only be detected by workers servicing the substation equipment or subtransmission line. Therefore, the operation of the Proposed Project would result in a less than significant impact under this criterion.

4.3.5 Evaluation and Comparison of Proposed and Alternative Routes

Alternatives A - E would also be located in MDAQMD and southern Clark County, and are similar in scope to the Proposed Project line. Each of the alternatives would have similar impacts as the Proposed Project. Air quality impacts would be less than significant.

Greenhouse Gases

The California Legislature has charged numerous state and local agencies with the task of developing regulations to address GHG emissions. For instance, the California Global Warming Solutions Act of 2006 (AB 32) charges the CARB with the responsibility to monitor and regulate sources of GHG emissions in order to reduce those emissions. CARB established a scoping plan in December 2008 for achieving reductions in GHG emissions, and must develop regulations by January 1, 2011 for reducing those emissions by the year 2020. AB 32 also directs CARB to recommend a de minimis threshold of GHG emissions below which emission reduction requirements will not apply. Furthermore, California Senate Bill 97, passed in August 2007, requires the Office of Planning and Research (OPR) to prepare and develop CEQA guidelines for the feasible mitigation of GHG emissions, including, but not limited to, effects associated with energy consumption. Those guidelines are expected to be available in 2010, but may not include numeric criteria.

Project-specific thresholds have yet to be developed by most responsible agencies, including the MDAQMD. However, the South Coast Air Quality Management District (SCAQMD) has developed specific CEQA emission threshold guidelines for GHG emissions for projects in which they are the lead agency. The SCAQMD developed their thresholds with the involvement of CARB, OPR, other agencies, and stakeholders. The latest draft of the CARB statewide guidelines is consistent with the SCAQMD guidelines. In the absence of statewide project-specific significance thresholds, the analysis of potential impacts in this PEA focuses on compliance with state and local plans and compares the emissions to the SCAQMD significance thresholds and the draft CARB recommendations.

The Climate Action Team, which consists of representatives from various state boards and departments, including the CPUC, has issued various reports outlining numerous strategies to reduce climate change-related emissions in California. The reports serve as the primary state guidance to date. The Proposed Project is therefore analyzed in light of whether it is consistent with the applicable GHG reduction measures recommended by the Climate Action Team's reports.

GHGs that contribute to climate change are CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons, and SF_6. The global warming potentials of these pollutants are usually quantified by normalizing their rates to an equivalent CO_2Eq. SF_6 gas is used in substation circuit breakers and can potentially leak from the equipment. CO_2, CH_4, and other trace combustion products are emitted by fuel burning equipment during the construction and operation of the proposed facilities.

SCE voluntarily reports SF_6 gas emissions and has developed measures to monitor and prevent leakage. SCE currently tracks SF_6 gas leakage on a system-wide basis. SCE SF_6 Gas Management Guidelines require proper documentation and control of SF_6 gas inventories, whether in equipment or in cylinders. Inventories are documented on both a quarterly and a yearly basis. SCE assumes that any SF_6 gas that is purchased and not used to fill new equipment is needed to replace SF_6 gas that has inadvertently leaked from equipment already in service. This allows SCE to track and manage SF_6 gas emissions. SCE currently voluntarily reports these emissions to the California Climate Action Registry, which was created by the California legislature to help companies track and reduce GHG emissions.

SCE has taken proactive steps in the effort to minimize GHG emissions since 1997. In 1997, SCE established an SF_6 Gas Resource Team to address issues pertaining to the environmental impacts of SF_6. The team developed the Gas Management Guidelines that allow for rapid location and repair of equipment leaking SF_6 gas. In addition, in 2001, SCE's parent organization, Edison International, joined the EPA's voluntary SF_6 gas management program, committing SCE to join the national effort to minimize emissions of this GHG. Importantly, SCE's SF_6 emissions in 2006 were 41 percent less than in 1999, while the inventory of equipment containing SF_6 gas actually increased by 27 percent during the same time period.

SCE has made a significant investment in not only improving its SF_6 gas management practices, but also purchasing state-of-the-art gas handling equipment that minimizes SF_6 leakage. The new equipment has improved sealing designs that virtually eliminate possible sources of leakage. SCE has also addressed SF_6 leakage on older equipment by performing repairs and replacing antiquated equipment through its infrastructure replacement program. It is expected that the Ivanpah Substation Project would have a minimal amount of SF_6 leakage as a result of the state-of-the-art equipment and SCE's SF_6 gas management practices. Pursuant to its existing practices, SCE would be reducing potential GHG impacts due to the Ivanpah Substation Project to the greatest practicable.

The applicable numeric significance threshold for projects within the SCAQMD is 10,000 metric tons per year of CO_2 equivalent GHGs. This threshold includes construction emissions amortized over 30 years. The current draft of the CARB recommendations has an applicable numeric threshold of 7,000 metric tons per year of CO_2 equivalent GHGs. CARB's threshold does not include construction emissions. Their current draft suggests that they may recommend fuel efficiency and other mitigation measures for construction activities.

The estimated total emission of GHGs from the construction activities is 6,100 metric tons CO_2Eq, all from combustion sources. Amortized over 30 years, the value is 205 metric tons per year. This estimate is much lower than the 10,000 metric ton per year SCAQMD guideline.

The estimated annual emissions of greenhouse gases from the operational activities are 1,756 metric tons CO_2Eq. This estimate is much lower than the 10,000 metric ton SCAQMD threshold or the 7,000 metric ton draft CARB threshold.

Since SCE complies with all Climate Action Team guidance and is well below the SCAQMD threshold and draft CARB recommendation, the Proposed Project is not expected to have a significant impact on greenhouse gas emissions.

4.3.6 References

United States Environmental Protection Agency 2008. Downloaded from http://www.epa.gov/oar/oaqps/greenbk/ancl.html, October 2008.

California Air Resources Board 2008. Downloaded from http://www.arb.ca.gov/research/aaqs/aaqs2.pdf, October 2008.

Mojave Desert Air Quality Management District, 2008. Downloaded from http://www.mdaqmd.ca.gov/rules_plans/documents/CEQAGuidelines.pdf, October 2008.

Met Office Hadley Centre 2009, Downloaded from http/hadobs.metoffice.com/hadcrut3/diagnostics/global/nh+sh/monthly, February 2009

4.4 BIOLOGICAL RESOURCES

This section describes existing conditions and the potential biological resource impacts associated with the construction and operation of the Proposed Project and Alternatives. Potential impacts to special status species, APMs, and species-specific mitigation measures are discussed in Sections 4.4.2.2: Applicant Proposed Measures and 4.4.5: Biological (Species-Specific) Conservation Measures, respectively.

4.4.1 Regulatory Setting

4.4.1.1 Federal

Endangered Species Act, Section 7 (ESA, 16 USC §1531 et seq., and 50 CFR § 17.1 et seq.)

The Endangered Species Act (ESA) was preceded by the Endangered Species Preservation Act in 1966, which provided limited protection for species by enabling a process for listing them as endangered. The Act also authorized the USFWS to acquire lands for the preservation of habitats essential for these species. A 1969 amendment to the Act provided additional protection against importation and sale of these species. This amendment also changed the name of the Act to the Endangered Species Conservation Act. Signing of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) in 1973 provided a means of controlling international commerce that potentially affected endangered species (USFWS 2008a). The ESA was passed by the U.S. Congress in 1973, and has since been amended several times. The review conducted for this Project included species that are provided protection under the ESA.

The only federally listed species that is known to occur within the Project area is the Mojave population Desert Tortoise (*Gopherus agassizii*), which is currently listed as a Threatened species under the ESA. No ESA proposed or Candidate species are known or anticipated to occur within the Project area.

Clean Water Act, Section 404 (33USC §1344)

The United States Army Corps of Engineers (USACE) has regulatory jurisdiction over Waters of the United States (WUS), including wetlands, as defined in Section 404 of the Clean Water Act (CWA) of 1977. WUS are primarily navigable waters such as ocean bodies, rivers, streams, and lakes, but also include wetlands, and in the West, normally dry washes. Recent changes in the Jurisdictional Delineation and Determination process resulting from recent court cases (e.g., the Rapanos case) resulted in re-interpretation of what constitutes jurisdictional waters under the CWA.

Wetland delineation is fundamental to USACE and EPA regulatory responsibilities under Section 404 of the CWA. Wetland delineation consists of standardized procedures that are used to determine if a wetland is present on a site and, if so, to establish its boundaries in the field. In combination with current regulations and policies, delineation methods help to define the area of Federal responsibility under the Act, within which the agencies attempt to minimize the impacts of proposed projects to the physical, chemical, and biological integrity of the Nation's waters. In determining jurisdiction under the CWA, the USACE is governed by federal regulations (33 CFR 320-330) that define wetlands, but do not provide a method to determine their boundaries. At various times both the USACE and EPA have issued guidance on the delineation of wetlands to their regulatory personnel. Today, the USACE Wetlands Delineation Manual is the accepted standard for delineating wetlands pursuant to the Section 404 regulatory program. An Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual for the Arid West Region was released by the USACE in December of 2006, and is the current accepted standard for this region (USACE 2006).

The USACE Regulatory Program provides protection for the Nation's aquatic resources, while allowing reasonable development through fair, flexible and balanced permit decisions. The USACE evaluates permit applications for essentially all construction activities that occur in the Nation's waters, including wetlands. USACE permits are also required for any work, including construction and dredging, in the Nation's navigable waters.

The USACE has the responsibility of ensuring that all forms of ground disturbing activities do not result in any adverse effects to WUS. The USACE either performs or receives jurisdictional delineations of WUS that are within the potential area of impacts for proposed developments, and provides a jurisdictional determination of effects. The jurisdictional review performed by the USACE may require modifications of development plans and specifications in order to preclude impacts to WUS.

A permitting system operated by the USACE, which addresses potential impacts to WUS under the CWA has two components, a Nationwide Permit System (NWP) and an individual permit category.

Overhead electrical transmission lines generally have little impact on WUS since most drainages can be spanned by the supporting structures, and even when there is the need to place tower/pole foundations in WUS, the size of the area of disturbance involved, usually as foundation(s), is typically quite small and usually does not involve impacts that require an individual permit. Often the greatest impacts to WUS associated with this type of development is disturbance to drainages resulting from the need for access to tower sites or ancillary areas such as wire splicing and pulling sites, temporary concrete batch plant sites, materials storage and/or equipment yards.

A pre-development jurisdictional delineation of WUS is planned for this Project. Since most xeric washes along the Project alignment are rather narrow, spanning of such features should be possible in all cases, and it is unlikely that tower foundations will need to be placed in WUS. The Project would likely be appropriately constructed under USACE NWP 12 – Utility Line Activities. Under NWP 12 each WUS crossing is treated as a separate permit. It is unlikely that the construction of any access or tower spur road would exceed the pre-construction notification limit (0.1 acre) of loss of WUS for NWP 12.

Clean Water Act, Section 401

"Water quality in California is governed by the Porter-Cologne Water Quality Control Act (California Water Code). This law assigns overall responsibility for water rights and water quality protection to the State Water Resource Control Board (SWRCB) and directs the nine statewide Regional Water Quality Control Boards (RWQCB) to develop and enforce water quality standards within their boundaries" (BLM 2008).

Applicants applying for USACE permit coverage under Section 404 of the CWA, for actions which may potentially result in any discharge into the navigable waters, must obtain a water quality certification from the state in which the action is proposed. Some NWPs provide conditional Section 401 coverage provided certain conditions are met. The State of California uses its CWA Section 401 certification authority to ensure Section 404 permits protect state water quality standards.

The California Water Code defines "Waters of the State" as any surface water or groundwater, including saline waters, within the boundaries of the state.

Migratory Bird Treaty Act (16 USC §7.3-712; 50 CFR §10)

The federal Migratory Bird Treaty Act of 1918 (MBTA) (16 USC 703-712) provides protection for a majority of bird species occurring in the United States. The major goal of the MBTA as it was originally conceived was to put an end to the commercial trade in birds and their feathers that, by the early years of the twentieth century, had wreaked havoc on the populations of many native bird species (USFWS 2002). The MBTA makes it unlawful to pursue, hunt, take, capture, kill, or sell birds listed under the Act. The statute does not discriminate between live or dead birds and grants full protection to any bird parts, including feathers, eggs, and nests.

There have been several amendments to the original law (including the Migratory Bird Treaty Reform Act of 1998) and currently, penalties include a fine of not more than $15,000 or imprisonment of not more than 2 years for misdemeanor violations of the Act. The 1998 Act also amended the law to make it unlawful to take migratory game birds by the aid of bait if the person knows or reasonably should know that the area is baited. Violations of the 1998 baiting amendment are punishable under title 18 United States Code, (with fines up to $100,000 for individuals and $200,000 for organizations), with imprisonment for not more than 1 year, or both.

The majority of bird species that occur in the United States as either residents or migratory species are covered by the MBTA. Common species that are not protected include the Rock Dove (*Columba livia*), the European Starling (*Sturnus vulgaris*), the House Sparrow (*Passer domesticus*), and gallinaceous bird species of the family Phasianidae. The Phasianidae includes species of grouse, Wild Turkey (*Meleagris gallopavo*), and ptarmigan, most of which are managed as game animals (USFWS 2005). The MBTA protects individual birds, their nests, eggs, and parts. The principal potential impacts that might result in violation of this law are associated with activities that would destroy nests, eggs, and young birds during the nesting season. In the Project area, the avian nesting season for most species is from late February to early July.

Pre-construction surveys for nesting birds should be conducted to preclude violation of the MBTA. Active nests may be avoided until the young have fledged or eggs and/or young may be moved by a licensed rehabilitation contractor. Performing vegetation clearing and other ground disturbing activities outside of the avian nesting season will minimize the potential for impacts to birds and violation of the MBTA.

<u>Bald and Golden Eagle Protection Act (16 USC §668; 50 CFR §22 et seq.)</u>

The Bald and Golden Eagle Protection Act (BGEPA) prohibits any form of possession or taking of both Bald Eagles (*Haliaeetus leucocephalus*) and Golden Eagles (*Aquila chrysaetos*). A 1962 amendment to the Act created a specific exemption for possession of an eagle or eagle parts (e.g., feathers) for religious purposes of Indian tribes. The amendment provided not only for the preservation of the Golden Eagle, but also the preservation of Native American cultural practice.

Penalties for initial violations include a fine not to exceed $5,000 and/or imprisonment for not more than 1 year. Penalties for subsequent violations include a fine not to exceed $10,000 and/or imprisonment of not more than 2 years.

<u>California Desert Protection Act of 1994</u>

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

California Desert Conservation Area Plan of 1980, as amended

The CDCA Plan was originally conceived under the FLPMA of 1976, which provided guidance for the development of a plan for the management of the public lands of the California Desert by the BLM.

Northern and Eastern Mojave Coordinated Management Plan

The Northern and Eastern Mojave (NEMO) Management Plan is a 2002 amendment to the CDCA plan. The NEMO plan set standards for the protection and preservation of public lands in the northern and eastern Mojave Desert in California. The plan established two desert wildlife management areas managed as ACEC for the recovery of the Mojave population Desert Tortoise. The NEMO plan also addressed grazing guidelines for public leases and adjusted herd management areas for wild horses (*Equus caballus*) and burros (*E. asinus*) as they affect the Desert Tortoise. The plan also identified priorities for potential land acquisitions and disposal of public lands. The plan incorporated 23 wilderness areas, and established the Amargosa River and Carson Slough ACEC for the management of various listed, endemic, and sensitive species in the NEMO area.

Desert Tortoise Recovery Plan and Critical Habitat Designation - 1994

The Desert Tortoise Recovery Plan established a strategy for the recovery and eventual delisting of the Mojave population Desert Tortoise. Six recovery units with 14 Desert Wildlife Management Areas (DWMA) were originally proposed in Arizona, California, Nevada, and Utah. Based on information in the Recovery Plan, twelve Critical Habitat Units (CHU) were established for the Mojave population Desert Tortoise by the USFWS on February 8, 1994 (59 FR 5820). A draft revised recovery plan was prepared in 2008, which re-delineated the recovery units based on recent genetic research (now five units). The recovery units cover the entire range of the Mojave population Desert Tortoise. No boundary changes were proposed for any of the CHUs; the only change was the renaming of the Chuckwalla CHU as the Chocolate Mountain CHU (USFWS 2008c). The Proposed Project does pass through designated Critical Habitat for the Mojave population Desert Tortoise.

Natural Communities Conservation Plan, Habitat Conservation Plan, and Other Jurisdictions in the Region

A review of the current (2008) USFWS-ECOS Conservation Plans and Agreements Database, and the California Department of Fish and Game (CDFG) Natural Community Conservation Planning status review revealed no Natural Communities Conservation Plan (NCCP), Habitat Conservation Plan (HCP), or candidate HCPs within the area of influence of this Project in California (CDFG 2008a; USFWS 2008b). The entire portion of the Project in Nevada is within Clark County, which has a Multiple Species Habitat Conservation Plan (MSHCP).

Tree Removal Ordinances

Cactus and Yucca

The BLM normally requires transplanting or salvage of certain native plant species that would be lost to development on lands under their jurisdiction. Species typically involved in these efforts include all cacti except chollas (*Cylindropuntia* spp.), which are left on the site to regenerate from stem segments, Yuccas (*Yucca* spp), and ocotillo (*Fouquieria splendens*). However, chollas should be selectively cleared prior to the avian nesting season to preclude impacts to MBTA protected bird species such as LeConte's Thrasher (*Toxostoma lecontei*), Cactus Wren (*Campylorhynchus brunneicapillus*), Mourning Dove (*Zenaida macroura*), and others, which commonly make use of larger chollas for nesting.

4.4.1.2 State

State of California

California Endangered Species Act (California Fish and Game Code §2050 et seq.)

The California Endangered Species Act (CESA) is similar to the federal ESA, and is administered by the CDFG. CESA was enacted to protect sensitive resources and their habitats. The CESA prohibits the take of CESA listed species unless specifically provided for under another state law. CESA does allow for incidental take associated with otherwise lawful development projects. To that end the CDFG recommends consultation early in the Project planning stage to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate mitigation planning to offset Project-caused losses of listed species.

The lead agency for any project on public lands is responsible for consulting with the CDFG to preclude activities that are likely to jeopardize the continued existence of any CESA listed threatened or endangered species or destroy or adversely affect habitat essential for any given species.

The only California State listed Threatened species that is known to occur in the Project area is the Mojave population Desert Tortoise. No other California Endangered or Threatened (i.e., CESA) species are known or anticipated to occur within the Project area.

California Department of Fish and Game Code §1600-1603, Streambed Alteration Agreement

This statute regulates activities that would "substantially divert or obstruct the natural flow of, or substantially change the bed, channel, or bank of, or use material from the streambed of a natural watercourse" that supports fish or wildlife resources. A stream is defined as a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation. A Streambed Alteration Agreement must be obtained for any proposed project that would result in an adverse impact to a river, stream, or lake. If fish or wildlife would be substantially adversely affected, an agreement to implement mitigation measures identified by the CDFG would be required.

California Native Plant Protection Act of 1977; California Fish and Game Code §1900 et seq.

This law includes provisions that prohibit the taking of listed rare or endangered plants from the wild. The law also includes a salvage requirement for landowners. Furthermore, it provides the CDFG the authority to designate native plants as endangered or rare and provides specific protection measures for identified populations.

California Fish and Game Code §3503.

This section prohibits the taking and possession of any bird egg or nest, except as otherwise provided by this code or subsequent regulations. The administering agency is the CDFG.

California Fish and Game Code §3503.5.

This section prohibits the taking, possession, or destruction of any birds-of-prey in the orders *Falconiformes* or *Strigiformes* and their eggs and nests, except as otherwise provided by this code or subsequent regulations. This statute does not provide for the issuance of any type of incidental take permit. The administering agency is the CDFG.

California Fish and Game Code §3511, §4700, §5515, and §5050.

These sections prohibit the taking and possession of birds, mammals, fish, and reptiles listed as "fully protected." The administering agency is the CDFG. The California Natural Diversity Database (CNDDB) was reviewed to identify special-status species potentially present in the Project Area.

California Fish and Game Code §3513 – Adoption of the Migratory Bird Treaty Act.

This section 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 is the CDFG.

California Food and Agriculture Code §80001 et seq. – California Desert Native Plants Act

The purpose of this act is to protect California desert native plants from unlawful harvesting on both public and privately owned lands, and provides provisions for the legal harvesting of native plants.

California Code of Regulations §670.2 and §670.5

The code lists wildlife and plant species listed as threatened or endangered in California. Species considered future protected species by the CDFG are designated California species of special concern (CSC). CSC species currently have no legal status, but are considered indicator species useful for monitoring regional habitat changes.

State of Nevada

Nevada Revised Statute 501

Nevada Revised Statute 501, supplemented by the Nevada Administrative Code (NAC), is the Nevada State Law that covers administration and enforcement of wildlife resources within the state.

Nevada Revised Statute 527.060 – .120

Nevada Revised Statute 427, supplemented by the NAC, protects and regulates the removal of Christmas trees, yuccas, and the cacti for commercial purposes. Such removal or possession requires a permit and tags from the Nevada Spur Forester Firewarden, Nevada Division of Forestry.

Clark County Multiple Species Habitat Conservation Plan – 2000

The purpose of the Clark County MSHCP is to provide for the long-term conservation and recovery of native species of wildlife and plants and their habitats, while allowing for responsible development of lands within Clark County. The Plan is designed to comply with statutory and regulatory requirements of the ESA and NEPA. The plan represents a county-wide conservation strategy that emphasizes ecosystem level management of natural resources, and which supplants earlier species specific conservation efforts. A review of available literature and secondary sources combined with several site reconnaissance visits revealed 17 MSHCP species that have either been observed or may be expected to occur within the Project area. These species are shown in Table 4-11 (on page 4-96).

Land Status

All of the lands that will be crossed by the California portion of the proposed 220kV transmission line route are administered by the BLM. The Nevada portion of the line is predominantly situated on BLM lands, but private lands would be crossed near the Eldorado Substation; and depending on the alternative selected, possibly at Primm, Nevada. Small segments of the Nipton 33kV line also cross private parcels at Nipton, California, near the Ivanpah Road crossing, and in the vicinity of the Mountain Pass Substation. In Nevada, the Eldorado-Lugo line passes through the Eldorado-Paiute ACEC, and in between, but not across, the South McCullough and Wee Thump Joshua Tree Wilderness Areas (Figure 4.4-1, located in Map Volume).

The Clark Mountain ACEC was designated under the CDCA Plan of 1980 to protect the natural and cultural values of the area (BLM 1980). The Clark Mountain ACEC has significant endemic plant species, plant communities, diverse wildlife elements, and cultural resource values. The

Clark Mountain ACEC is just west and north of the Mountain Pass Substation. No portion of the proposed action would impact the Clark Mountain ACEC.

4.4.2 Significance Criteria and Approach to Impact Assessment

4.4.2.1 Significance Criteria

Impacts to biological resources are considered potentially significant under CEQA if the Project would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the USFWS, BLM, CDFG, or NDOW.
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the USFWS, BLM, CDFG, or NDOW.
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including but not limited to marsh, vernal pool, and coastal) through direct removal, filling, hydrological interruption, or other means.
- Interfere substantially with the movement of any native resident, migratory fish, wildlife species, or with established native resident or migratory wildlife corridor, or impede the use of native wildlife nursery sites.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

4.4.2.2 Applicant Proposed Measures

SCE proposes the following APMs to avoid, minimize, correct, reduce, or eliminate impacts to special status species, or to compensate for impacts to wildlife and plant habitat. These measures will be applied throughout the Project study area.

BIO-1 Preconstruction surveys. Preconstruction biological clearance surveys will be conducted to identify special-status plants and wildlife.

BIO-2 Minimize vegetation impacts. Every effort will be made to minimize vegetation removal and permanent loss at construction sites. If necessary, native vegetation will be flagged for avoidance.

BIO-3 Avoid impacts to state and federal jurisdiction wetlands. Construction crews will avoid impacting the streambeds and banks of streams along the route to the extent possible. If necessary, a SAA will be secured from the CDFG. Impacts will be mitigated based on the terms of the SAA. No streams with flowing waters capable of supporting special status species will be expected to be impacted by the Project.

BIO-4 Best Management Practices. Crews will be directed to use BMPs where applicable. These measures will be identified prior to construction and incorporated into the construction operations.

BIO-5 Biological monitors. Biological monitors will be assigned to the Project in areas of sensitive biological resource. The monitors will be responsible for ensuring that impacts to special status species, native vegetation, wildlife habitat, or unique resources will be avoided to the fullest extent possible. Where appropriate, monitors will flag the boundaries of areas where activities need to be restricted in order to protect native plants and wildlife or special status species. Those restricted areas will be monitored to ensure their protection during construction.

BIO-6 Worker Environmental Awareness Program. A WEAP will be prepared. All construction crews and contractors will be required to participate in WEAP training prior to starting work on the Project. The WEAP training will include a review of the special status species and other sensitive resources that could exist in the Project area, the locations of sensitive biological resources and their legal status and protections, and measures to be implemented for avoidance of these sensitive resources. A record of all trained personnel will be maintained.

BIO-7 Avoid impacts to active nests. SCE will conduct Project-wide raptor and nesting bird surveys and remove trees or other vegetation, if necessary, outside of the nesting season (nesting season in the Project area is late February to early July). If vegetation or existing structures containing a raptor nest or other active nest must be removed during nesting season, or if work is scheduled to take place in close proximity to an active nest on an existing transmission or subtransmission tower or pole, SCE will coordinate with the USFWS, CDFG, and/or the NDOW as appropriate to obtain written verification prior to moving the nest.

BIO-8 Avian Protection. All transmission and subtransmission towers and poles will be designed to be avian-safe in accordance with the Suggested Practices for Avian Protection on Power Lines: the State of the Art in 2006 (Avian Power Line Interaction Committee 2006).

BIO-9 Facility Siting. Final tower and spur road locations will be adjusted to avoid sensitive biological resources to the greatest extent feasible.

BIO-10 Invasive Plant Management. An invasive plant management plan will be developed to reduce the potential for spreading invasive plant species during construction activities.

4.4.2.3 Approach to Impact Assessment

The following definitions were used to evaluate potential impacts to biological resources for each of the Project components and alternatives during construction, and for subsequent operations and maintenance phases. Unlike NEPA, CEQA uses the terms "effects" and "impacts" interchangeably. CEQA definitions for various types of impacts are as follows:

- **Direct –** CEQA defines direct impacts as those effects that are "…caused by a project and occur at the same time and place." Any modification, disturbance, or loss of a biological resource that would result from a project activity would be considered a direct impact. Examples include habitat loss from vegetation removal, loss of individual plants or wildlife by any construction activity, and alteration of surface water flow.

- **Indirect –** CEQA defines indirect impacts as those effects that are "…reasonably foreseeable and caused by a project, but occur at a different time or place." And "…An indirect physical change in the environment is a physical change…which is not immediately related to the project, but which is caused indirectly by the project. If a direct physical change in the environment in turn causes another change in the environment, then the other change is an indirect change in the environment." Examples include human impacts to resources resulting from new access developed as part of the Project, subsequent colonization of habitat by invasive plant species, and impacts to water quality resulting from erosion induced by and subsequent to Project activities.

- **Permanent –** Any impact that permanently removes a biological resource. Examples include irreversible alteration of suitable habitat that supports a species, placement of a structure that permanently removes habitat, or destruction of a local population of a species, including impacts that result in this effect over time from reduction of a population to a non-sustainable level.

- **Temporary –** Any impact where the effects are reversible through a short time interval, through mitigation measures, or the combination of both. Examples include construction disturbances such as temporary human presence, noise, minor vegetation removal, which allows unassisted natural re-vegetation, or supplemented by seed bank salvage and replacement, or re-seeding.

4.4.3 Environmental Setting

Regional Setting

The biological resources study area lies within the Eldorado and Ivanpah Valleys in southern Clark County, Nevada, and a portion of the Ivanpah Valley in southeastern California. Valley fills are thousands of feet in depth, and surface drainage is interior to the Eldorado, Ivanpah, Roach, and Jean evaporite playa lake beds. Soil runoff potentials in the Project area vary from low to very low in the interior valleys, to very high in the McCullough Mountains (NRCS 2008).

The northern portion of the McCullough Mountains, through which the transmission line route passes is composed primarily of relatively young volcanic rocks (6-17 million years in age), including rhyolite, silicic tuff, basalt, and andesite (Stewart and Carlson 1977). At the east edge of the Ivanpah Valley in Nevada the line passes between Sheep Mountain to the north and skirts the north end of the Lucy Gray Mountains. Sheep Mountain is comprised primarily of limestone and dolomite of Paleozoic age, with the northern end of the structure dominated by more recent volcanics associated with those in the McCullough Range to the east. The Lucy Gray Mountains are dominated by Precambrian (1.4 to 1.7 billion years in age) metamorphic and intrusive gneisses and schists (Stewart and Carlson 1977).

Farther west, in the California portion of the Project, the Clark Mountains possess a rather complex geology associated with the Clark Mountain Fault complex. The area is highly mineralized, with ores containing copper, silver, gold, lead, zinc, and rare earth minerals (Jennings 1961; Jessey et al. No date). There is a long history of mining in the area, which continues today.

The entire Project study area is located within the Mojave desertscrub biome, as described by Turner (1982). The Mojave Desert is characterized by rather abrupt mountain ranges, generally of moderate height, surrounded by aprons of low-profile bajada slopes, which drain to interior closed basins. This interior drainage with no outlets results in the formation of evaporite playa lakes in the valley bottoms (Benson and Darrow 1981). These playas are typically high in evaporated salts, and plant communities here are usually represented by salt tolerant (halophytic) species. A generally accepted elevation range for the Mojave Desert is from a low of -479 feet in Death Valley, California, up to 4,500 feet along the northern edge of the biome, and up to 5,500 feet in the mountains (Turner 1982). Elevations within the Project study corridor vary from approximately 1,800 feet at the Eldorado Substation to 5,305 feet at the Mountain Pass Substation. Annual precipitation for the Mojave Desert typically ranges from 2.5 to 7.5 inches, predominantly from winter rains, which occur from mid-December through early March. The dominant winter precipitation and magnitude of the summer to winter temperature differential (continentality) are physical attributes that have been used to describe the Mojave Desert (Turner 1982).

Approach to Data Collection

Assessment of potential impacts to biological resources that could result from construction, operation, and maintenance of this Project included a review of current regional literature, accessing agency Internet biological databases, and conducting Project field surveys. The area reviewed included the Project limits of influence, primarily areas defined by watersheds in which the Project is present, but also including a perimeter that would incorporate home ranges of species peripheral to the core Project area such as large mammals and birds. Agency Internet sites used in the review included the Nevada Natural Heritage Program (NNHP) database, the CNDDB, CDFG - Nongame Wildlife Program, USFWS, and BLM. The CNDDB search was performed for the following 8 U.S. Geological Survey (USGS) quadrangles; State Line Pass, Clark Mountain, Ivanpah Lake, Desert, Mescal Range, Mineral Hill, Nipton, and Crescent Peak.

Reconnaissance Level Surveys

The purpose of reconnaissance surveys conducted for this Project was to identify vegetation communities present along the Proposed Project route and alternatives, and to conduct preliminary searches for sensitive plant and wildlife species in suitable habitats within the Project limits. Reconnaissance level surveys are used to identify areas within the Project limits that may require additional protocol or pre-construction clearance surveys for sensitive species occurring in the Project area where they may be subject to impacts. SCE's consultant biologists (EPG) visited the Project area on April 7 to 10 and April 14 to 15, 2008 to conduct initial reconnaissance surveys for biological resources in the Project area. Biological resources were assessed within a 250-foot-wide corridor along the transmission lines. They surveyed the entire existing transmission line route from the Eldorado Substation west to the proposed Ivanpah

Substation site (proposed transmission line route), and from the proposed Ivanpah Substation site west to the Mountain Pass Substation (Path 2-Section 3-Alternative 1). Transmission line Alternatives A and B near the Eldorado Substation, and Alternatives C and D near Primm, Nevada were also surveyed. The proposed fiber optic telecommunication route along the Nipton 33kV distribution line, from the Ivanpah Substation site to Mountain Pass Substation, and the Nipton 33kV/Earth 12kV line from Mountain Pass Substation south to an existing AT&T microwave site, were also surveyed.

Additional reconnaissance visits were conducted on August 25 to 26 and October 27 to 28, 2008. The August site visit included transmission route Alternative C, a portion of the Nipton 33kV line west of Nipton, California, and the fiber optic route alternative between Nipton and the Eldorado-Lugo 500kV transmission line along Nipton-Moore Road. The October visit included transmission line Alternatives D and E, the proposed fiber optic route along the Eldorado-Lugo 500kV transmission line from the Eldorado Substation south to where the 500kV transmission line crosses the UPRR and the Nipton 33kV line between Nipton and the point where the Nipton 33kV line crosses I-15.

Surveys consisted of driving or walking all survey areas and identifying vegetation types and all plants and animals observed. Special attention was given to recording any state or federally listed plants and animals, BLM sensitive species, and state-listed species of special concern. All transmission towers along the ROWs were scanned with binoculars to identify large stick nests and all observations of wildlife and plants were recorded. Results of the reconnaissance surveys are provided in the Eldorado-Ivanpah Transmission Project Biological Resources Summary Report (EPG 2008).

Photograph points and locations of all species of special concern encountered were recorded with a hand-held GPS. Locations were recorded using the Universal Transverse Mercator (UTM), North American Datum (NAD 83).

Weather conditions for April 7 to 10 were sunny, but cool (approximately 60 degrees Fahrenheit daytime high) and windy, with wind gusts above 35 miles per hour. For April 14 and 15, conditions were sunny and warm, with temperatures up to 85 degrees Fahrenheit. During the August 25 to 26 visit, the weather was hot (near 100 degrees Fahrenheit each day), with light intermittent breezes, and localized thunderstorms with cooler temperatures in the vicinity of the McCullough Mountains and Ivanpah Valley. For October 27 to 28 daytime highs were in the upper 80s and skies were clear.

Protocol and Field Surveys

Protocol and focused surveys provide specific location information on sensitive species occurrences within the Project limits. These data are useful during pre-development selection of alternatives and siting of structures, and construction phase avoidance of resources. Focused surveys conducted included USFWS protocol-level presence/absence surveys (including zones of influence) for Mojave population Desert Tortoise, and surveys for rare plants and invasive/noxious weed species. Desert Tortoise surveys were conducted in May of 2008. Rare plant and invasive/noxious weed surveys were conducted on April 7, 8, 13, 14, May 1, and September 24, 2008.

Desert Tortoise surveys included the main proposed transmission line alignment and ancillary facilities and all alternatives identified at the time of the survey. Surveys were conducted by Alice E. Karl and Associates in the spring of 2008. It is anticipated that additional Desert Tortoise surveys will be conducted in spring 2009 for additional route alternatives and Project areas which were added after the spring 2008 surveys. Results of the Desert Tortoise surveys are provided in the Desert Tortoise Survey Report (Karl 2009), an appendix to the Project Biological Resources Summary Report.

A rare plant and invasive/noxious weed survey was conducted by GLC Consulting, Kingman, Arizona. GLC Consulting developed a target species list by consulting lists of state and federally listed species and similar species lists maintained by the California Native Plant Society, the California Natural Diversity Database, the Nevada Natural Heritage Program, the Nevada Native Plant Society, and the California and Nevada offices of the BLM.

Field surveys for rare plants were conducted along the Proposed Project ROW and at all ancillary facilities that were on maps provided by SCE. Surveys were conducted by driving and walking the ROW; driving along the ROW until suitable habitat for one or more of the target species was encountered, and then searching that habitat for the species in question. Areas not surveyed included existing substation facilities, the Ivanpah Lake dry playa, and disturbed ground areas and paved roads and parking lots near Primm, Nevada.

All rare plant localities were recorded using a handheld global positioning system unit. Locations were recorded in UTM, NAD 83. Point locations for individuals or small groups of plants were recorded. For larger patches of plants the width of the patch was recorded by taking a GPS reading at the beginning and end of the patch. Unless patches were very large with many plants, the numbers of plants present at a location was also recorded. Plant survey results are found in the Eldorado-Ivanpah Transmission Project Biological Resources Summary Report (EPG 2008).

Local Setting

Vegetation Community Summary

The proposed and alternative Eldorado-Ivanpah transmission line routes and associated telecommunication components occur in southern Nevada and southeastern California. The Project area extends from near Boulder City, Nevada on the east, west to the Clark Mountains and south to the New York Mountains in Southeastern California. The Project occurs in an area defined as the Mojave Desert, and vegetation at lower elevations over most of the Project is characteristic of the creosote bush-white bursage (*Larrea tridentata-Ambrosia dumosa*) series (Sawyer and Keeler-Wolf 1995). Other habitat types in the Project area include saltbush (*Atriplex* spp.) scrub, Joshua tree (*Yucca brevifolia*) woodland, black bush (*Coleogyne ramosissima*) scrub, Mojave yucca desertscrub, and catclaw acacia (*Acacia greggii*) scrub (Figure 4.4-2a through 4.4-2f, located in Map Volume).

Vegetation Type Descriptions

Six main vegetation types are located within the Project area including black bush scrub, catclaw acacia scrub, creosote scrub/creosote-white bursage scrub, Joshua tree woodland, Mojave yucca desertscrub, and saltbush scrub. In addition, there are areas relatively devoid of native vegetation including the dry lake beds, developed areas, paved roads, highways, and access roads and other disturbed areas associated with construction and mining operations.

Saltbush Scrub

Saltbush scrub typically has low plant species diversity, and on the Project is dominated by saltbush species, white bursage, and big galleta (*Pleuraphis rigida*) located in alkaline soils around the perimeter of the dry lake beds. Vegetation is an intermittent to open canopy, generally less than 2 feet in height.

Creosote Bush Scrub/Creosote Bush-White Bursage Scrub

The creosote bush-white bursage series, which is dominated by creosote bush and augmented by a variety of other shrubs, including four-wing saltbush (*Atriplex canescens*), all-scale (*A. polycarpa*), desertsenna (*Senna armata*), cheesebush (*Hymenoclea salsola*), sweetbush (*Bebbia juncea*), and other less common shrubs. Numerous annual plants and forbs are present to varying degrees, including pincushion flower (*Chaenactis fremontii*), bristly fiddleneck (*Amsinckia tessellate*), desert globemallow (*Sphaeralcea ambigua*), cryptantha (*Cryptantha* sp.), combseed (*Pectocarya* sp.), and Mediterranean grass (*Schismus barbatus*). Cacti are not common at lower elevation; however, they are more common at higher elevations and on steeper slopes. Cacti species present include Wiggins' cholla (*Cylindropuntia echinocarpa*), Engelmann's hedgehog cactus (*Echinocereus engelmannii*), California barrel cactus (*Ferocactus cylindraceus*), diamond cholla (*Cylindropuntia ramosissima*), and beavertail pricklypear (*Opuntia basilaris*).

Mojave Yucca Desertscrub

Mojave yucca (*Yucca schidigera*) is the dominant over-story plant in this plant community, which is ecotonal between creosote bush-white bursage scrub and Joshua tree woodland communities. This plant community has a greater abundance of plant species than creosote bush communities, including more species of cacti. Cactus species include California barrel cactus, cottontop cactus (*Echinocereus polycephalus*), Wiggins' and diamond chollas, Engelmann's hedgehog cactus, and beavertail pricklypear. Shrub species include Virgin River brittlebush (*Encelia virginensis*), and white bursage at the lower, and black bush at the upper limits of the plant community.

Joshua Tree Woodland

Joshua tree woodland occurs at middle elevations in the Project area. Joshua tree woodland is dominated by Joshua trees as the over-story plant with Mojave yucca, ephedras (*Ephedra* sp.), cheesebush, California buckwheat (*Eriogonum fasciculatum*), and wolfberry (*Lycium andersonii*) present as common shrub species. Creosote bush and black bush typically occur at ecotonal boundaries with lower and upper bounding plant communities respectively.

Black Bush Scrub

This plant community, typical of mid-elevation desert mountains, is dominated by black bush and features emergent Utah juniper (*Juniperus osteosperma*), singleleaf piñon (*Pinus monophylla*), and numerous shrub species including ephedra, annuals, and perennial plants, including turpentinebroom (*Thamnosma montana*), goldenbush (*Ericameria* sp.), Mexican bladder sage (*Salazaria mexicana*), desert lupine (*Lupinus shockleyi*), freckled milkvetch (*Astragalus lentiginosus*), and desert paintbrush (*Castilleja angustifolia*). Black bush scrub intergrades with creosote bush scrub at lower elevations and Joshua tree woodland at higher elevations.

Catclaw Acacia Series (Desert Wash Habitat)

Vegetation present within the numerous desert washes support widely scattered catclaw acacia and more commonly ephedra, cheesebush, and sweetbush. Mesquite mistletoe (*Phoradendron californicum*) occurs in some of the catclaw acacia in wash areas. Vegetation along canyon bottoms and washes in the McCullough Mountains is shrub-dominated with no emergent tree species. Shrubs present include catclaw acacia, wolfberry, California trixis (*Trixis californica*), Virgin River brittlebush, and California buckwheat.

Vegetation on Alternatives and Telecommunication Routes

The proposed and alternative transmission line routes are located primarily within creosote bush-white bursage vegetation, with the exception of the McCullough Mountains north pass which includes desert wash vegetation dominated by catclaw acacia, and the areas immediately adjacent to the dry lake bed of Ivanpah Lake which are dominated by saltbush scrub. Several of the telecommunication routes pass through higher elevation areas with a greater diversity of vegetation types. The area around the Mountain Pass Substation, on the Nipton 33kV telecommunication alternative, is located in black bush series habitat, with Utah juniper being an important element of the plant community. In the Mountain Pass area, species of yucca (*Y. baccata*, *Y. brevifolia*, and *Y. schidigera*) are common but not abundant, and several species of cacti, including prickly pear species (*Opuntia* spp.), chollas, and others, are present. In addition, the approach to the Mountain Pass substation from the east supports a few singleleaf piñons.

The Eldorado-Lugo 500kV transmission line telecommunication alternative (Path 2-Section 1) passes through habitats dominated by creosote bush scrub, Mojave desertscrub, Joshua tree woodland, black bush scrub, and crosses areas with desert wash xeroriparian habitat. As the line continues south from the Eldorado Substation, the elevation gradually increases up the bajada, and the pure creosote bush scrub, with a few white bursage and rarely an occasional Wiggins' cholla, gradually becomes ecotonal with Mojave desertscrub habitat and an attendant increase in vegetation density and diversity, including the Nipton 33kV telecommunication route between Nipton, California, and I-15 (Path 2-Section 3) is located within creosote bush scrub and crosses saltbush scrub on the southern end of the Ivanpah Lake bed.

4.4.4 Environmental Impacts and Mitigation Measures

Special Status Species

Some species of plants and animals are accorded special status by state and federal agencies largely because they are either scarce on a regional level, facing clearly defined threats, or in a position within the regional landscape to potentially become scarce. Special status species at the federal level include those listed as threatened, endangered, proposed, or candidates for listing under the ESA. BLM-designated sensitive species are designated by the BLM State Director's Office. Still other species are tracked by state heritage programs and assigned different levels of concern based on rarity and perceived level of threat.

In California, plant and animal taxa are tracked and monitored by the CDFG via the CNDDB. The State of California through the Fish and Game Code may also formally designate plants and animals as state-listed threatened or endangered. The CDFG also maintains a list of fully protected species which may not be taken or possessed at any time and permits are required for scientific collecting and/or relocation (for the protection of livestock).

In Nevada, at-risk taxa are tracked through the NNHP within the Department of Conservation and Natural Resources. The NNHP also assigns rank indicators to plant and animal species based on rarity and perceived level of threat. The State of Nevada can also fully protect wildlife species through the stipulations of Nevada Revised Statute 501. The State of Nevada also protects "critically endangered" plant species as well as cacti and yuccas under Nevada Revised Statute 527.

Special status species with the greatest probability of occurrence within the California and Nevada portions of the Project area are identified in Tables 4-10 and 4-11. The California list was derived from an online search of the CNDDB coupled with additional review of published literature. Similarly, the Nevada list was derived from an online review of the listing of special status species in Clark County. Species covered by the Clark County MSHCP are included in the review. Evaluation and Watch List species identified in the plan were not considered.

The narrative following the tables addresses those species that are either federal or state listed, or BLM sensitive species with highest degree of rarity and threat, and sensitive species that were identified by the BLM as being of special concern within the general Project area. Only those species documented as occurring in the Project area, or identified as likely to occur, are discussed.

TABLE 4-10
SPECIAL STATUS SPECIES OF WILDLIFE AND PLANTS WITH POTENTIAL TO OCCUR IN THE CALIFORNIA SEGMENT OF THE PROJECT AREA

Common Name	Scientific Name	Habitat	Status	Potential
MAMMALS				
Townsend's Big-eared Bat	*Plecotus townsendii*	Mines, caves, and buildings in Mojave desertscrub	BLM, S2, S3	U
Hoary Bat	*Lasiurus cinereus*	Areas with trees in Mojave desertscrub and piñon-juniper	S4?	U
Ringtail	*Bassariscus astutus*	Rocky and brushy terrain in foothills and desert; use mines	FPS	U
American Badger	*Taxidea taxus*	Mojave desertscrub	BLM, S4	L
Desert Bighorn Sheep	*Ovis canadensis nelsoni*	Steep mountainous terrain	BLM, S3	L
Wild Burro	*Equus asinus*	Mostly low desert environments	WHBA	O
BIRDS				
Western Burrowing Owl	*Athene cunicularia hypugaea*	Flat, open, sparsely vegetated land with animal burrows	BLM	L
Golden Eagle	*Aquila chrysaetos*	Open country	FPS	L
Gray Vireo	*Vireo vicinior*	Piñon-juniper	BLM, S2	U
Bendire's Thrasher	*Toxostoma bendirei*	Dense brushlands within Mojave desertscrub	BLM, S3	U
Crissal Thrasher	*Toxostoma crissale*	Mojave desertscrub	S3	U
Le Conte's Thrasher	*Toxostoma lecontei*	Sparsely vegetated desert	BLM‡	L
Virginia's Warbler	*Vermivora virginiae*	Chaparral and other brushy habitats at mid to higher elevations	S2, S3	U
Hepatic Tanager	*Piranga flava*	Forested areas	S1	U
Summer Tanager	*Piranga rubra*	Pine – oak woodland	S2	U
Gray-headed Junco	*Junco hyemalis* (*caniceps* group)	Mixed woodland, may occur in piñon-juniper habitat	S1	U
REPTILES				
Desert Tortoise	*Gopherus agassizii*	Mojave desertscrub	FT, ST, S2	O
Gila Monster	*Heloderma suspectum*	Mojave desertscrub	BLM‡, S4	L
INVERTEBRATES				
Kokoweef Crystal Cave Harvestman	*Texella kokoweef*	Kokoweef Cave endemic species	S1	U
PLANTS				
Mormon needle grass	*Achnatherum aridum*	Outcrops in shrub-steppe, piñon – juniper and Joshua tree habitats	S2.2	L
White bearpoppy	*Arctomecon merriamii*	Mojave desertscrub	S2.2	L
Desert Ageratina	*Ageratina herbacea*	Rocky, piñon-juniper; New York and Clark mountains	S2.3	U
Mojave milkweed	*Asclepias nyctaginifolia*	Arroyos and dry slopes in Mojave desertscrub	S2	O
Cima milkvetch	*Astragalus cimae* var. *cimae*	Calcareous soils in piñon-juniper and Joshua tree habitats	S2.2	U
Scaly cloak fern	*Astrolepis cochisensis cochisensis*	Piñon-juniper and Joshua tree habitats	S2.3	L
Black grama	*Bouteloua eriopoda*	Dry, open, sandy to rocky slopes, flats, washes, scrub, woodland.	S3.2	O
Gilman's Cymopterus	*Cymopterus gilmanii*	Limestone or gypseous soils at 1,000 to 2,000 meters	S2.2	L
Utah vine milkweed	*Cynanchum utahense*	Sandy to gravelly soils in Mojave Desertscrub at 150-1,420 meters	BLM, S3.3	O
Howe's hedgehog cactus	*Echinocereus engelmannii* var. *howei*	Mojave desertscrub	BLM‡	U
Desert pincushion	*Escobaria vivipara* var. *deserti**	Limestone soils 1,000 to 2,400 meters	S2.2	†

TABLE 4-10
SPECIAL STATUS SPECIES OF WILDLIFE AND PLANTS WITH POTENTIAL TO OCCUR IN THE CALIFORNIA SEGMENT OF THE PROJECT AREA

Common Name	Scientific Name	Habitat	Status	Potential
Viviparous foxtail cactus	*Escobaria vivipara* var. *rosea***	Sandy to rocky soils	S1, S2	†
Nine-awned pappus grass	*Enneapogon desvauxi*	Rocky slopes or in crevices on calcareous soils in desert woodland; piñon-juniper at 1,275 to 1,825 meters	S2?	O
Limestone daisy	*Erigeron uncialis* var. *uncialis*	Limestone crevices between 2,100 and 2,900 meters	S2.2	U
Clark Mountain spurge	*Euphorbia exstipulata* var. *exstipulata*	Rocky slopes at 1,800 to 2,000 meters; only in the Clark Mountains	S1.3	U
Hairy Erioneuron	*Erioneuron pilosum*	Rocky slopes in piñon-juniper woodland	S2, S3	U
California Barrel Cactus	*Ferocactus cylindraceus*	Gravelly or rocky hillsides, canyons, and alluvial fans	BLM‡	O
Wright's bedstraw	*Galium wrightii*	Rocky habitat in shady canyons; piñon-juniper; Clark Mountains	S1.2	U
Pungent glossopetalon	*Glossopetalon pungens*	Limestone cliffs from chaparral to piñon-juniper; only in the Clark Mountains	BLM, S1.3	U
Parish club cholla	*Grusonia parishii*	Joshua tree habitat, this plant is present on the proposed Ivanpah Substation site	S2.3	O
Hairy-podded fine-leaf Hymenopappus	*Hymenopappus filifolius* var. *eriopodus*	Limestone soils in piñon-juniper habitat in the New York and Clark mountains	S1.3	L
Jaeger's ivesia	*Ivesia jaegeri*	Limestone crevices at 2,100 to 3,600 meters in the Clark Mountains	BLM, S1.3	U
Knotted rush	*Juncus nodosus*	Stream banks, lake shores, marshes, and swamps	S2.3	U
Hillside wheat grass	*Leymus salinus mojavensis*	Hillsides in desert mountains between 1,350 and 2,000 meters; piñon-juniper	S1.3	L
Plains flax	*Linum puberulum*	Dry ridges of desert mountains at 1,000 to 2,500 meters	S2.3	L
Rough Menodora	*Menodora scabra*	Rocky soils of canyons in the New York and Clark mountains	S2.3	L
Polished blazing star	*Mentzelia polita*	Limestone or gypseous soils between 1,200 and 1,500 meters in the Clark Mountains; associated with *Ephedra nevadensis* and *Rhus* spp.	S1.2	L
Red four o'clock	*Mirabilis coccinea*	Dry, rocky slopes, and washes; piñon-juniper habitat	S2.3	L
Tough muhly	*Muhlenbergia arsenei*	Limestone rock outcrops and slopes; Clark Mountains	S1, S2	L
False buffalo grass	*Munroa squarrosa*	Open, gravelly, or rocky places from 1,500 to 1,800 meters; Clark Mountains	S1, S2	U
Beavertail pricklypear	*Opuntia basilaris* var. *brachyclada*	Occurs in chaparral habitats	BLM‡	U
Curved-spine beavertail	*Opuntia curvospina*	Mojave desertscrub	S1.2	L
Spiny cliffbrake	*Pellaea truncata*	Granitic or igneous outcrops from 1,200 to 1,900 meters; piñon-juniper habitat in the New York mountains	S2	L
Rosy two-toned beardtongue	*Penstemon bicolor* ssp. *roseus*	Mojave desertscrub	S1.3	L
Stephens' penstemon	*Penstemon stephensii*	Mojave desertscrub or piñon-juniper woodland	BLM‡	L
Thompson's beardtongue	*Penstemon thompsoniae*	Piñon-juniper habitat on white calcareous soils; New York and Clark Mountains	S1.3	U

TABLE 4-10
SPECIAL STATUS SPECIES OF WILDLIFE AND PLANTS WITH POTENTIAL TO OCCUR IN THE CALIFORNIA SEGMENT OF THE PROJECT AREA

Common Name	Scientific Name	Habitat	Status	Potential
Aven Nelson's phacelia	*Phacelia anelsoni*	Sandy or gravelly soils in creosote bush, piñon-juniper, or Joshua tree habitats from 1,200 to 1,500 meters	S2.3?	O
Sky-blue phacelia	*Phacelia coerulea*	Open, sandy to rocky areas in Mojave desertscrub and piñon-juniper habitats from 1,400 to 2.000 meters	S2.3	O
Jaeger's phacelia	*Phacelia perityloides* var. *jaegeri*	Crevices on cliffs and rocky, often calcareous slopes from 1,900 to 2,300 meters in the Clark Mountains	S1.3	U
Chamber's physaria	*Physaria chambersii*	Limestone soils in piñon-juniper habitat from 1,500 to 2,500 meters in the Clark Mountains	S2.3	L
Small-flowered rice grass	*Piptatherum micranthum*	Gravel benches or rocky slopes from 700 to 2,950 meters	S2, S3	U
New Mexico locust	*Robinia neomexicana*	Canyons below 1,500 meters in piñon-juniper habitat in the Mid Hills	S1.3	U
Abert's sanvitalia	*Sanvitalia aberti*	Dry slopes at about 1,800 meters; New York and Clark mountains	S1, S2	L
Many-flowered schkuhria	*Schkuhria multiflora* var. *multiflora*	Dry, sandy soils of Mojave desertscrub from 1,500 to 1,700 meters	S1.3	U
Johnson's beehive cactus	*Sclerocactus johnsonii*	Creosote bush habitat on granitic soils from 500 to 1,200 meters	S1.3	U
Rusby's desert mallow	*Sphaeralcea rusbyi* var. *eremicola*	Mojave desertscrub and Joshua tree habitats from 1,300 to 1,500 meters; Clark Mountains	BLM, S1.3	L

Status:
FT = Federally listed as Threatened (ESA)
BLM = Bureau of Land Management sensitive species; BLM? – not on BLM list of sensitive plants
FPS – State of California Fully Protected Species
ST = California listed as Threatened
CNDDB State Ranking:
S1 = Less than 6 Eos, OR less than 1,000 individuals, Or less than 2,000 acres
S1.1 = very threatened S1.2 = threatened S1.3 = no current threats known
S2 = 6-20 Eos, OR 1,000-3,000 individuals, OR 2,000-10,000 acres
S2.1 = very threatened S2.2 = threatened S2.3 = no current threats known
S3 = 21-100 Eos, OR 3,000-10,000 individuals, OR 10,000-50,000 acres
S3.1 = very threatened S3.2 = threatened S3.3 = no current threats known
S4 = Apparently secure within California. NO THREAT RANK
S5 = Demonstrably secure to ineradicable in California. NO THREAT RANK
WHBA = Wild Free-Roaming Horses and Burros Act
Potential of Occurrence: L – Likely (moderate or better potential) U – Unlikely (low potential) O – Observed During Reconnaissance Studies
References: Benson, L. 1982; CDFG 2003; Jepson 2008.
* Formerly *Coryphantha chlorantha*.
** Formerly *Coryphantha vivipara* var. *rosea*
† Individuals of a species of *Escobaria* (*Coryphantha*) were located; species determination will require presence of flowers.
‡ BLM sensitive species not listed in the CNDDB database.

TABLE 4-11
SPECIAL STATUS SPECIES OF WILDLIFE AND PLANTS WITH POTENTIAL TO OCCUR IN THE NEVADA SEGMENT OF THE PROJECT AREA

Common Name	Scientific Name	Habitat	Status	Potential
MAMMALS				
California Leaf-nosed Bat	*Macrotus californicus*	Desertscrub, warm roost sites required in winter	BLM, ART	L
California Myotis	*Myotis californicus*	Dry, brushy habitats, roosts in cracks and crevices	BLM, ART	L
Small-footed Myotis	*Myotis ciliolabrum*	Moister areas; oak, juniper, chaparral, and riparian areas	BLM, ART	U
Long-eared Myotis	*Myotis evotis*	Forested areas from mid-elevations up to subalpine habitat.	MSHCP	U
Little Brown Bat	*Myotis lucifugus*	Mostly pine and pine-oak, has occurred at 1,000 feet near the Colorado River	BLM, ART	U
Fringed Myotis	*Myotis thysanodes*	Desertscrub to pine forest, most common in pine forest	BLM, ART	U
Cave Myotis	*Myotis velifer*	Caves, mines, buildings, bridges, usually near water	BLM, ART	U
Lone-legged Myotis	*Myotis volans*	Occurs above 4,000 feet in piñon-juniper or oak forest.	MSHCP	U
Townsend's Big-eared Bat	*Plecotus townsendii*	Mines, caves and buildings in Mojave desertscrub	BLM, ART	L
Spotted Bat	*Euderma maculatum*	Low desert to coniferous forest, rocky cliffs near water	BLM, 501	U
Big Free-tailed Bat	*Nyctinomops macrotis*	Rugged, rocky areas in desertscrub	BLM, ART	L
Desert Bighorn Sheep	*Ovis canadensis nelsoni*	Rugged, mountainous terrain, known to be present in the McCullough Range	BLM	O
Wild Burro	*Equus asinus*	Mostly low desert environments	WHBA	U
BIRDS				
Western Burrowing Owl	*Athene cunicularia hypugaea*	Flat, open, sparsely vegetated land with animal burrows	BLM, 501	L
Peregrine Falcon	*Falco peregrinus*	Cliffs with large expanses of open air	BLM, 501, MSHCP	L
Prairie Falcon	*Falco mexicanus*	Dry, open areas with cliffs and deep canyons for nesting	BLM	L
Phainopepla	*Phainopepla nitens*	Mesquite thickets along washes	BLM, 501, MSHCP	O
Loggerhead Shrike	*Lanius ludovicianus*	Open desertscrub and in denser vegetation along washes	BLM	L
REPTILES				
Desert Tortoise	*Gopherus agassizii*	Mojave desertscrub, especially on lowland flats	FT, 501, MSHCP	O
Western Banded Gecko	*Coleonyx variegatus*	Creosote bush flats, sage, associated with rocks, or sometimes barren dunes	MSHCP	L
Desert Iguana	*Dipsosaurus dorsalis*	Creosote bush desert with hummocks or loose sand and hardpan areas with rocks	MSHCP	L
Black Collared Lizard	*Crotaphytus insularis*	Frequents rocky areas in arroyos and on slopes of hills in creosote bus, saltbush, and Basin sagebrush deserts	MSHCP	L
Long-nosed Leopard Lizard	*Gambelia wislizenii*	Areas with scattered low plants such as creosote bush, alkali bush or sagebrush on various substrates	MSHCP	L
Chuckwalla	*Sauromalus ater*	Rocky outcrops in Mojave Desertscrub	BLM	O
Gila Monster	*Heloderma suspectum*	Mojave desertscrub	BLM, 501	L

TABLE 4-11
SPECIAL STATUS SPECIES OF WILDLIFE AND PLANTS WITH POTENTIAL TO OCCUR IN THE NEVADA SEGMENT OF THE PROJECT AREA

Common Name	Scientific Name	Habitat	Status	Potential
Western Leaf-nosed Snake	*Phyllorhynchus decurtatus*	Sandy or gravelly desert closely associated with creosote bush	MSHCP	L
Glossy Snake	*Arizona elegans*	Variety of habitats, sparse shrubby to barren desert, chaparral slopes, sagebrush flats, and grasslands	MSHCP	L
Common Kingsnake	*Lampropeltis getula*	Found in a wide variety of habitats, including desert	MSHCP	L
Long-nosed Snake	*Rhinocheilus lecontei*	Occurs in desert or shrubby habitats	MSHCP	L
Lyre Snake	*Trimorphodon biscutatus*	Mostly a rock dwelling snake, often in areas of massive rock outcrops in creosote bush, desert scrub, or desert grassland	MSHCP	L
Speckled Rattlesnake	*Crotalus mitchellii*	Generally in rocky area, usually associated with creosote bush, sagebrush or succulent desert	MSHCP	L
Sidewinder	*Crotalus cerastes*	Fine wind-blown sandy areas associated with creosote bush or other vegetation in hummocks; also on flats and rocky hillsides	MSHCP	L
Mojave Rattlesnake	*Crotalus scutulatus*	Most common in scattered shrubby growth such as creosote bush and mesquite; also found in scrubland and barren desert	MSHCP	L
INVERTEBRATES				
Nevada Admiral	*Limenitis weidemeyerii nevadae*	Along streams in coniferous habitat in the Spring Mountains above 6,560 feet in association with aspen, cottonwood, willows, or shadbush	MSHCP	U
Carole's Silverspot Butterfly	*Speyeria zerene carolae*	Piñon-juniper and mixed conifer habitats in the Spring Mountains between 5,900 and 8,860 feet elevation	MSHCP	U
Spring Mountains Comma Skipper	*Hesperia Colorado* (*comma*) *mojavensis*	Forest openings, meadows, fields, and trails up to alpine elevations; feeds on various grass species.	MSHCP	U
PLANTS				
Las Vegas bearpoppy	*Arctomecon californica*	On open, powdery, dry gypsum soils. Adjacent to *Larrea tridentata, Atriplex* spp., or *Coleogyne ramosissima* associations between 1,060 and 3,640 feet elevation	MSHCP	U
White bearpoppy	*Arctomecon merriamii*	Creosote bush scrub, limestone outcrops and dry lake beds	BLM, W, MSHCP	U
Clokey milkvetch	*Astragalus aequalis*	Calcareous gravelly flats, hillsides, and open ridges from 5,900 to 8,400 feet. The species often shelters under oak, pine, or sagebrush	MSHCP	U
Spring Mountain milkvetch	*Astragalus remotus*	In gravelly or sandy soils in desert wash or desert shrub communities between 3.400 and 7,050 feet elevation	MSHCP	U
Blue Diamond cholla	*Opuntia whipplei* var. *multigeniculata*	Carbonate rock and soils, often associated with gypsum, with other succulent species in either creosote bush or black bush-dominated habitat. Found between 3,300 and 4,700 feet	MSHCP	U
Scrub lotus	*Lotus argyraeus* var. *multicaulis*	Piñon-juniper woodland, uncommon	BLM, W	U
White-margined beardtongue	*Penstemon albomarginatus*	Sand dunes and/or deep, sandy soils	BLM, ART, MSHCP	O

TABLE 4-11
SPECIAL STATUS SPECIES OF WILDLIFE AND PLANTS WITH POTENTIAL TO OCCUR IN THE NEVADA SEGMENT OF THE PROJECT AREA

Common Name	Scientific Name	Habitat	Status	Potential
Rosy twotone beardtongue	*Penstemon bicolor* ssp. *roseus*	Rocky, calcareous soils in washes, on roadsides, or in scree at the base of outcrops – creosote bush or black bush desertscrub	BLM, ART	O
Jaeger beardtongue	*Penstemon thompsoniae* var. *jaegeri*	Gravelly limestone soils from piñon-juniper to subalpine conifer habitats between 5,580 and 11,060 feet elevations	MSHCP	U
Parish phacelia	*Phacelia parishii*	On moist, mostly barren soils associated with valley bottom flats, playa edges, often at seeps between 2,190 and 5,920 feet	MSHCP	U

Status Codes:
- FT – Federally listed as threatened
- BLM – BLM sensitive species
- ST – Listed by the State of Nevada as threatened
- W – Nevada Native Plant Society (NNPS) Watch List species; potentially vulnerable to becoming threatened or endangered
- ART – Nevada Natural Heritage Program At Risk Taxa
- 501 – Protected under NRS 501
- MSHCP - Clark County Multiple Species Habitat Conservation Plan

* Species detected during rare plant and/or reconnaissance surveys in spring 2008

Potential of Occurrence: L – Likely (moderate or better potential) U – Unlikely (low potential) O – Observed During Reconnaissance Studies

Results of Site Surveys

Summary of Desert Tortoise Survey Report – awaiting report from Alice E. Karl and Associates

Summary of Rare Plant and Invasive/Noxious Weed Survey

Rare Plants

A rare plant and invasive/noxious weed survey was performed along the Proposed Project route from the existing Eldorado Substation to the proposed Ivanpah Substation site, and extending west along the fiber optic communications route to the Mountain Pass Substation. The surveys were conducted by GLC Consulting of Kingman, Arizona on April 7, 8, 13, 14; May 1; and September 24, 2008. The September survey effort was targeted at species that are fall rain response species, and was focused only in habitats suitable for those species. These included nine-awned pappus grass (*Enneapogon desvauxii*), squareseed spurge (*Euphorbia exstipulata*), Devils Canyon muhly (*Muhlenbergia appressa*), and Abert's sanvitalia (*Sanvitalia aberti*). Prior to conducting the surveys, GLC Consulting developed a target list containing 57 potential rare plant species compiled from lists of state and federally listed species and similar species lists maintained by the California Native Plant Society (CNPS 2001), the CNDDB, the NNHP, the Nevada Native Plant Society, and the Needles, California and Las Vegas, Nevada offices of the BLM. The Project rare plant list includes CNPS Lists 1B, 2, and 4 species. List 1B plants are defined by the CNPS as "Plants rare, threatened, or endangered in California and elsewhere." List 2 plants are "Plants rare, threatened, or endangered in California, but more common elsewhere," and List 4 plants are "Plants of limited distribution – a watch list." The rare plant target list is located in Appendix C (Eldorado-Ivanpah Transmission Project Biological Resources Summary Report, EPG 2008).

The survey consisted of driving the ROW access roads and conducting pedestrian surveys in areas of suitable habitat for plants on the Project rare plant list. Approximately 70 percent of the Project was surveyed on foot. There is no drivable access for the western portion of the fiber optic route between the Ivanpah Substation site and the Mountain Pass Substation. The full length of this portion of the route was conducted on foot. The survey covered a width of approximately 250 feet centered on the Project ROW. Separate vascular plant lists were compiled from observations for the California and Nevada segments of the Project. The survey documented 253 species and varieties of vascular plants for the California segment of the Project, and 203 species for the Nevada segment. These lists are located in Appendix C.

Six CNPS List 2 species were documented in the California segment of the Project, including: Mojave milkweed (*Asclepias nyctaginifolia*), nine-awned pappus grass, desert pincushion (or viviparous foxtail cactus) *Escobaria vivipara* (var. *deserti* or *rosea*), Parish club cholla (*Grusonia parishii*), Aven Nelson's phacelia (*Phacelia anelsoni*), and sky-blue phacelia (*Phacelia coerulea*). Two CNPS List 4 species present are black grama (*Bouteloua eriopoda*) and Utah vine milkweed (*Cynanchum utahense*). There were nine occurrences of *E. vivipara*, five of Aven Nelson's phacelia, four clusters of Parish club cholla, two occurrences of nine-awned pappus grass, and one each of Mojave milkweed, sky-blue phacelia, and Utah vine milkweed.

The Nevada segment of the survey revealed the presence of two rare plant species, the rosy twotone beardtongue (*Penstemon bicolor* ssp. *roseus*) and the white-margined beardtongue (*P. albomarginatus*), both of which are BLM sensitive species, and NNHP at-risk taxa. Eighteen occurrences of the rosy twotone beardtongue were located, all along the east flank of the north McCullough Pass, and down onto the lower bajada within the Project ROW. Occurrences varied from a single individual to 11 plants. Several white-margined beardtongue plants were observed within the Project ROW between the northeast flank of the dry Roach Lake bed and the west flank of the Lucy Gray Mountains.

Noxious Weeds

Noxious weeds are species of non-native plants included on the weed lists of the USDA (2008), California Department of Food and Agriculture (CDFA [2008]), the California Invasive Plant Council (CIPC [2008]), Nevada Department of Agriculture (NDOA [2005]), or those weeds of special concern identified by the BLM. There were no high concentrations of noxious weeds observed anywhere along the Project ROW.

Noxious weeds encountered during the plant surveys included 9 species within the California segment and 8 species within the Nevada segment of the Project (Table 4-12). Compact brome (*Bromus madritensis* var. *rubens*), redstem stork's bill (*Erodium cicutarium*), African mustard (*Malcolmia africana*), prickly Russian thistle (*Salsola tragus*), common Mediterranean grass and Saltcedar (*Tamarix ramosissima*) were common to both Project segments. Wild oat (*Avena fatua*), cheatgrass (*Bromus tectorum*), and Chilean chess (*B. trinii*) were found only on the California segment, and Bermudagrass (*Cynodon dactylon*) and London rocket (*Sisymbrium irio*) were unique to the Nevada segment of the Project. Asian mustard (*Brassica tournefortii*) was reported to be present on the adjacent proposed Ivanpah Solar Electric Generating (ISEG) plant site in the Certificate of Environmental Compatibility (2008), and is likely to be present within the Project area.

TABLE 4-12
NOXIOUS WEED SPECIES DOCUMENTED ON THE PROJECT

Common Name	Scientific Name	California Invasive Plant Inventory Invasiveness Rating	Control	Project Segment
Wild oat	*Avena fatua*	Moderate	Control	CA
Asian mustard	*Brassica tournefortii*	High	Eradicate	CA & NV
Compact brome	*Bromus madritensis* var. *rubens*	High	Not feasible	CA & NV
Cheatgrass	*Bromus tectorum*	High	Not feasible	CA
Chilean chess	*Bromus trinii*	Not rated*	Not rated*	CA
Bermudagrass	*Cynodon dactylon*	Moderate	Control	NV
Redstem stork's bill	*Erodium cicutarium*	Limited	Not feasible	CA & NV
African mustard	*Malcolmia Africana*	Not rated*	Not rated*	CA & NV
Russian thistle	*Salsola tragus*	Limited	Eradicate	CA & NV
Mediterranean grass	*Schismus barbatus*	Limited	Not feasible	CA & NV
London rocket	*Sysimbrium irio*	Moderate	Control	NV
Saltcedar	*Tamarix ramosissima*	High	Eradicate	CA & NV

*USDA listing as invasive, not rated.
CIPI Ratings:
High – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

TABLE 4-12 NOXIOUS WEED SPECIES DOCUMENTED ON THE PROJECT				
Common Name	**Scientific Name**	**California Invasive Plant Inventory Invasiveness Rating**	**Control**	**Project Segment**
Moderate – These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread. **Limited** – These species are invasive, but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.				

Special Status Wildlife Species – California Segment

American Badger (BLM, S4)

The American Badger (*Taxidea taxus*) is frequently found on the flats and alluvial fans next to desert mountains (Hoffmeister 1986). They occupy a diversity of habitats in California, particularly with the following elements: sufficient food, friable soils, and relatively open uncultivated land. Their diet is mainly comprised of burrowing rodents such as Pocket Gophers (*Thomomys* spp.), Ground Squirrels (*Spermophilus* spp.), Marmots (*Marmota* spp.), and Kangaroo Rats (*Dipodomys* spp.). They will also eat mice, woodrats (*Neotoma* spp.), reptiles, birds and their eggs, and bees and other insects (CDFG 1986).

Badger populations have declined drastically in California. They do not survive on cultivated land. Urban and agricultural development has probably had the greatest detrimental effects on badgers. They were also targets of deliberate killing for many years. They have suffered from rodent and predator poisoning (CDFG 1986).

No badgers or their burrows were observed during any of the Project surveys or reconnaissance efforts for this Project, but a badger was observed during field surveys for the Ivanpah Solar Electric Generating System in 2007 (CEC 2008), so the species is confirmed in the immediate Project area. They are more likely to occur on upper portions of bajadas where greater plant species diversity and cover provides better habitat for prey species.

Desert Bighorn Sheep (BLM, S3)

The subspecies of Desert Bighorn Sheep (*Ovis canadensis nelsoni*) that is present in the Project area has no status except that the State of California affords it a ranking of S3 (21-100 element occurrences OR 3,000 – 10,000 individuals, or 2,000 – 10,000 acres of habitat), and the BLM considers it a sensitive species. Nelson's Bighorn Sheep is classified by the CDFG as a Big Game mammal and annual hunting seasons allow for a very limited take of this species. The Clark Mountains and the entire California portion of the Project ROW are in the CDFG Zone 3 for Desert Bighorn Sheep hunting (Figure 4.4-3, located in Map Volume).

Desert Bighorn are creatures of rugged, open mountainous terrain where adequate forage, water, and escape terrain are available. Bighorn, especially rams, will move between mountain ranges provided the distance of flat open desert to be crossed is not great or their route between ranges is not bisected by intense human activity (e.g., freeways). Ewes generally tend to be more sedentary and long movements by ewes between mountain ranges are unusual.

Within the Project area in California, Nelson's Bighorn is likely confined to the rugged, upland topography associated with the Clark Mountain Range. Predation of Bighorn Sheep in the Kingston, Clark, and Granite mountains in California by Mountain Lion (*Felis concolor*), in recent years, has depressed Bighorn populations in these areas (Wehausen 2006).

Wild Burros (WHBA)

The Wild Burro (*Equus asinus*) receives protection under the 1971 federal Wild Free-Roaming Horses and Burros Act (16 USC 1331-1340). The act protects wild horses and Burros within designated allotments on lands administered by the United States Forest Service and the BLM. The rationale is to maintain populations of these animals in ecological balance within the designated areas. The species is not listed as threatened or endangered by the USFWS (ESA) or the State of California. The California Fish and Game Code (No. 4600) provides additional protection for these animals (MacDonald 2006). The genus *Equus* evolved in North America contemporaneously with grassland habitats and only later expanded to South America and Europe.

As of 2006 there were only three remaining Wild Burro herds in California, none of which are considered genetically viable populations. The combined California populations consist of approximately 345 animals (MacDonald 2006). Wild burros are present on the California portion of this Project. Recent burro scat was observed on the west edge of Ivanpah Lake during the August 2008 site visit.

Raptor Nests

There is a general lack of natural potential roosting and nesting habitat for raptors along most of the California portion of the Project. There is some potential nesting habitat in the Clark Mountains near the Mountain Pass Substation where there are rocky cliffs and a few piñon pine. Electrical transmission line lattice towers probably provide most of the potential raptor nesting habitat in the area. A single raptor nest was observed being constructed by a pair of Red-tailed Hawks (*Buteo jamaicensis*) in a lattice tower in the east foothills of the Clark Mountains in April of 2008, and a second stick nest was observed in a lattice tower on the Project in August of 2008. This nest was not obviously active. Stick nests in lattice towers are often re-occupied or modified and re-used intermittently by raptors and corvids returning to an area annually. The nests are generally persistent on the towers for years. An apparent lack of stick nests in lattice structures along the existing transmission line may reflect depressed raptor populations in the area. A pre-construction survey for raptor/corvid nests in the existing lattice towers should be performed prior to initiation of construction. Burrowing Owls (*Athene cunicularia*) may occur in areas where the ground surface is relatively flat, vegetation is low and typically sparse, and burrowing animals provide burrows which can be modified for use by the birds. No Burrowing Owls have yet been observed within the Project limits.

Migratory Bird Treaty Act

The principal potential impacts that might result in violation of this law are associated with activities that would destroy nests, eggs, and young birds during the nesting season. In the Project area the avian nesting season for most species is from late February to early July.

Given the higher elevation and greater diversity (species and structure) in the plant community at Mountain Pass and on the southern portion of the Eldorado-Lugo 500kV line, it may be that these areas get used more by transient, summer visitor, and permanent resident birds than lands to the north, south, and east. Indeed, Clark Mountain has been identified as a rather unique situation in its upper elevations due to populations of more montane species including Flammulated Owl (*Otus flammeolus*), Broad-tailed Hummingbird (*Selasphorus platycercus*), Hairy Woodpecker (*Picoides villosus*), Mountain Chickadee (*Poecile gambeli*), Hermit Thrush (*Catharus guttatus*), and Western Bluebird (*Sialia Mexicana*) (Miller 1940). With this information in hand, close attention will be paid to the avian community and any future impacts this Project may have.

Golden Eagle (FPS, BGEPA, MBTA)

The Golden Eagle is relatively common in the western United States and can be found in a variety of habitats, but prefers open ground or low hills where visibility is good for hunting (Ehrlich et al. 1988; Glinski 1998). They nest on cliffs, large or small trees, and sometimes telephone poles (Glinski 1998). The Golden Eagle feeds primarily on mammals, preferring rabbits (*Lepus* spp.) and ground squirrels, but also will feed on snakes, birds, and large insects when mammals are unavailable (Ehrlich et al. 1988; Glinski 1998; Terres 1980).

Suitable nesting habitat for the Golden Eagle is present in the Clark Mountains, but primarily in rockier areas at higher elevations, and not within the Project corridor. There is also potential for Golden Eagles nesting in the upper elevations of the McCullough Mountains, and there is a probable nesting record for the Highland Range (Floyd et al. 2007), which is east of the Eldorado-Lugo 500kV alignment that is proposed for use to support the fiber optic telecommunications line. The lands through which the Project passes are quite open, and provide suitable hunting habitat for the Golden Eagle. The Golden Eagle was recorded near the Ivanpah Substation site during biological surveys for the Ivanpah Solar Electric Generating System (ISEGS) site in 2008 (CEC 2008), and is thus known to be present in the area.

Burrowing Owl (BLM)

These small owls use a variety of habitat types, including shortgrass prairie, open scrublands of mesquite (*Prosopis* spp.), creosote bush, or rabbit-brush (*Chrysothamnus* spp.), agricultural fields, airports, and golf courses (Terres 1980, Ehrlich et al. 1988, Dechant et al. 1999). In desert areas, habitat is typically treeless, open, and relatively level. Burrowing Owls often select burrows where surrounding vegetation is kept short by grazing, dry conditions, or burning (Hjertaas et al. 1995; Dechant et al. 1999). The Burrowing Owl is unique among North America owls in nesting in burrows in the ground. They are semi-colonial and usually occupy burrows excavated by small mammals, often at the edges of active colonies of prairie dogs (*Cynomys* spp.) or Ground Squirrels. In areas that lack colonial burrowing mammals, Burrowing Owls will use excavations made by other animals such as badgers, woodchucks (*Marmota monax*), skunks, foxes, armadillos (*Dasypus novemcinctus*), coyotes (*Canis latrans*), and tortoises. They may also use natural cavities in rocks and openings in man-made structures. In addition to the nest burrow they may also use several satellite burrows. Satellite burrows may serve as protection from predators and parasites (Dechant et al. 1999). Burrowing Owls in the western United States do not dig their own burrows, and thus, the presence of burrowing animals is a critical element of their habitat.

Burrowing owls are opportunistic feeders, preying on a variety of arthropods and small vertebrates (Dechant et al. 1999; Hjertaas et al. 1995). They may forage during the day or night, but tend to forage closer to the nest during the day. Foraging habitat requirements are variable, depending on prey availability and abundance.

The Project is within the greater limits of the known range of the Burrowing Owl, and is within the historic and current breeding ranges of the species (Shufford and Gardali 2008). A review of current information shows almost no recent breeding records in the eastern portion of the Mojave Desert that includes the Project area (CNDDB 2008; Institute for Bird Populations 2008; State of California 2008; Bates 2006). However, while no Burrowing Owls have as yet been observed within the limits of the California portion of the Project, they were observed on the adjacent proposed ISEGS site in 2008 (CEC 2008). The ISEGS site is proximal to the proposed Ivanpah Substation site, thus the owls are documented in the immediate area.

LeConte's Thrasher (BLM)

LeConte's thrasher (*Toxostoma lecontei*) is very sparsely distributed in southern California, western Arizona, southern Nevada, and extreme southwestern Utah (Schram 1998). It is generally restricted to the lowest, hottest, and most barren desert plains, particularly in saltbush and creosote bush habitats (Terres 1980). LeConte's thrashers feed primarily on large insects and other terrestrial invertebrates, and they occasionally eat lizards, other vertebrates, seeds, or fruit (Dobkin and Granholm 2005; Ehrlich et al. 1988). Populations of this species are very sparse, with densities in optimum habitat of five pairs or fewer per square mile (Remsen 1978). This species is very secretive and sensitive to human disturbance. Specific threats include off-road vehicle activity and clearing of shrubs for agriculture or other development.

LeConte's Thrashers are very likely to occur within the Project area, mostly on lower portions of the bajada on the east side of the Clark Mountains where vegetation is sparse and where chollas provide suitable nesting sites.

Mojave Population Desert Tortoise (FT, ST, S2)

The Mojave population of the desert tortoise is currently California state (CDFG 2008b) and federally listed as a Threatened species (Federal Register 1990), and a recovery plan was prepared in 1994 (USFWS 1994). In this study the Mojave population was divided into six distinct population segments or recovery units, each designated as an evolutionarily significant unit (ESU). Each ESU was delineated based on variations in genetic, morphological, ecological, physiological, and behavioral traits (USFWS 1994). A draft revised recovery plan was released in 2008 by the USFWS (USFWS 2008c). The revision redraws the recovery unit boundaries based on recent genetic research, and there are now five units. There were no proposed boundary changes for the 12 CHUs (Figure 4.4-4, located in Map Volume). The CNDDB ranking for the Desert Tortoise is S2.

The Mojave population of the desert tortoise is found primarily in Mojave desertscrub, but it also occurs in the Lower Colorado River Subdivision of Sonoran desertscrub in southeastern California. They are generally associated with communities dominated by creosote bush with other sclerophyllous shrubs and small cacti present (Arizona Game and Fish Department [AZGFD] 2001). Some parts of their habitat may contain abundant Joshua trees. The Mojave Desert Tortoise prefers sandy loam or rocky soils in valleys, bajadas, and hills (AZGFD 2001). They may be found at elevations below sea level in Death Valley, California, and up to about 1,500 meters (4,922 feet) at Yucca Mountain, Nevada (AZGFD 2001). Desert Tortoises are facing numerous threats to their survival. Livestock grazing, recreational OHV use, military training activities, urban development, and increases in predation are some of the factors affecting tortoise survival (Lovich 2003). Additional threats are takes of tortoises for commercial sale as pets, from vandalism (shooting, crushing, or mutilation) and for food (USFWS 1994).

The entire Project area is within the range of the species, and most of the area provides some suitable habitat for tortoises. The California segment of the Proposed Project alignment does not pass through any federally designated (ESA) Critical Habitat for the desert tortoise. However, placement of the overhead fiber optic telecommunications cable on the Nipton 33kV distribution line (California portion) and the underground fiber optic cable on the north side of Nipton Road/Highway 164 east of I-15 is wholly within Desert Tortoise Critical Habitat in the Ivanpah Recovery Unit. In addition, the proposed microwave tower northeast of Nipton and the associated fiber optic and electrical facilities will also be located within the desert tortoise critical habitat. The length of this segment is approximately 14.6 miles. Approximately 2.0 miles of this segment is on the Ivanpah Lake playa, and is not considered suitable desert tortoise habitat. The western portion of this segment, where it climbs the bajada, is the most suitable tortoise habitat along this segment of the Nipton line.

A Project protocol level survey for the desert tortoise was performed by Alice E. Karl and Associates in May of 2008 for the existing 115kV transmission line route between the Eldorado Substation in Nevada and the Mountain Pass Substation in California. Desert tortoise sign was observed throughout the majority of the survey area withih the exception of the developed and disturbed areas around Primm, Nevada, the dry lake palayas, and the higher elevation areas around Mountain Pass Substation. It is anticipated that alternative transmission routes and telecommunication routes will be surveyed in the spring of 2009. The desert tortoise survey results are located as an appendix to the project Biological Resources Summary Report.

Gila Monster (BLM, S4)

The Gila Monster (*Heloderma suspectum*) has no federal status under the ESA; it is a BLM sensitive species in California and is accorded a State of California Rank of S4 (Apparently Secure in California, no threat rank). The State of California considers the Gila Monster to be a species of special concern and it is listed and tracked by the CNDDB. While it appears that Gila Monster populations in the state are not faced with any immediate threat, their numbers are very low, with only 26 credible records, from four counties in the past 153 years (Beaman and Lovich 2007).

Most records of Gila Monsters in California have come from areas characterized by steep, rocky topography associated with large, relatively high mountain ranges. Most localities are associated with canyons and riparian areas including the lower Colorado River. Brown and Carmony (1991) stress that rough, rocky country is an important component of Gila Monster habitat and that the animal eschews flat plains thinly populated by creosote bush. Habitat of this type provides many opportunities for crevices under rocks and similar structures that can be used for winter hibernacula and and/or summer dens. Trees and shrubbery are an important part of Gila Monster habitat that provide shade and cover, but also because such plants support larger populations of prey species.

Gila Monsters utilize dry washes and their edges, as well as mesquite thickets for foraging. Given that the Gila Monster is a comparatively slow-moving lizard, its prey consists mostly of defenseless baby animals and eggs which they detect by chemical cues and odors. Prey items include baby Cottontails (*Sylvilagus* spp.), Round-tailed Ground Squirrels (*Spermophilus tereticaudus*), and other small mammal species. Gambel's Quail (*Callipepla gambelii*) and Desert Tortoise eggs are often taken, as well the eggs of doves and other birds. In Arizona, foraging activity occurs in two seasonal peaks that coincide with the nesting of quail and doves, and births of Cottontails during the spring months of April and May. A second surge in activity occurs in response to Cottontail births and dove nesting that begins with the onset of the summer rains (Brown and Carmony 1991). Beaman and Lovich (2007) suggest that summer rains may be important to the foraging ecology of the species in California.

With respect to the Project area, the only potentially suitable Gila Monster habitat in California is the rougher terrain near Clark Mountain, and on the mountain slopes and canyons near the Mountain Pass Substation.

Special Status Plant Species – California Segment

<u>Mormon Needle Grass (S2.2)</u>

Mormon needle grass (*Achnatherum aridum*) is associated with rock outcrops or shrub-steppe habitats where Joshua tree or piñon-juniper woodland habitats on carbonate soils are present between approximately 3,940 and 5,100 feet (1,200 and 1,550 meters) elevation (CNPS 2001). Stems may approach 3 feet in height, with the inflorescence 2 to 7 inches in length, and may be partially enclosed by the upper leaf sheath. Plants flower in May or June (Jepson Interchange 2008).

Mormon needle grass was not observed during the Project plant or reconnaissance surveys, but suitable habitat is present for the species in Antimony Canyon east of the Mountain Pass Substation.

<u>White Bearpoppy (S2.2)</u>

The white bearpoppy (*Arctomecon merriamii*) is an evergreen perennial herb. The leaves are basal, rounded-dentate, and moderately pilose, the hairs long and erect, which give the leaves a bluish-green appearance. The emerging flower stalks have the typical poppy family nodding habit of the flower bud, which becomes erect at maturity. The flowers, which have white petals on stalks 12 to 16 inches in height, appear in the spring (NNHP 2001). The white bearpoppy occurs in southeastern California and southern Nevada (Jepson 2008). The plants occur on generally barren, calcareous soils, alluvial gravels and carbonate rock outcrops at elevations of 2,000 to 6,280 feet (Jepson 2008; NNHP 2001). Populations of the white bearpoppy are decreasing in number (NNHP 2001).

The white bearpoppy was not observed during the Project plant or reconnaissance surveys, but suitable habitat for the species may occur within the Project area. There is a CNDDB record of the species northeast of Umberci Mine at "Bearpoppy Saddle," which is approximately four miles west of the north end of Transmission Line Alternative C. There are additional records between the Umberci Mine and Stateline Pass to the northeast.

Mojave Milkweed (S2)

Mojave milkweed is a perennial plant with decumbent to erect stems to about one foot in height. The leaves are opposite, and may be elliptic, lanceolate, or oval. Greenish-white flowers may be present between May and September (CNPS 2001; Jepson 2008; Kearney and Peebles 1960). The plants occur along arroyos or on dry slopes between 1,500 and 5,580 feet elevation (CNPS 2001; Kearney and Peebles 1960). In California the species is generally associated with piñon-juniper woodland (Calflora 2008). The range of the Mojave milkweed is from San Bernardino County, California, east to New Mexico (CNPS 2001). The Mojave milkweed was observed to be present on the Project based on a single observation from the rare plant survey.

A single Mojave milkweed plant was observed during the rare plants survey approximately 0.55 mile southwest of the proposed Ivanpah Substation site. Suitable habitat is present from this location west to the vicinity of the Mountain Pass Substation.

Scaly Cloak Fern (S2.3)

The scaly cloak fern (*Astrolepis c.* var. *cochisensis*) is a perennial herb of small stature, generally between 1 and 4 inches in height, associated with limestone outcrops and associated rocky slopes between approximately 2,950 and 5,900 feet elevation in piñon-juniper woodland or in habitats that contain Joshua trees (CNPS 2001; Jepson 2008). The species occurs from California east to New Mexico.

Suitable habitat for the scaly cloak fern may be present in the vicinity of the Mountain Pass Substation, but the plant was not observed during the rare plant survey conducted for the Project.

Black Grama (S3.2)

Black grama is a tufted perennial herb of the western United States and northern Mexico that has decumbent to erect stems to approximately 2 feet in height. Inflorescences are generally present between May and October (CNPS 2001; Gould 1951). Black grama most commonly occurs in dry habitats with sandy or rocky soils in flats, on slopes, along washes and in scrub and woodland communities, including piñon-juniper habitat between 2,950 to 6,230 feet elevation (CNPS 2001; Gould 1951; Jepson 2008).

Black grama is present on the Project, and was observed in more than one location in Antimony Canyon east of the Mountain Pass Substation during the Project rare plant survey.

Gilman's Cymopterus (S2.2)

Gilman's cymopterus (*Cymopterus gilmanii*) is known only from Nevada and California, and occurs in Mojavean desertscrub habitat, often on carbonate substrates, between approximately 3,280 and 6,560 feet elevation (CNPS 2001). Flower stalks are usually less than 9 inches in height, with the greenish-purple flowers appearing between April and May (Jepson 2008).

Gilman's cymopterus was not observed during any of the Project surveys, but there are CNDDB records for the species in the Clark Mountains, and suitable habitat may be present in the Project area near the Mountain Pass Substation. There are also CNDDB records of the species at "Bear Poppy Saddle," which is approximately 4.0 miles west of the north end of Transmission Line Alternative C, and additional records to the north near Kally Mine and the vicinity of Stateline Pass.

Utah Vine Milkweed (BLM, S3.3)

Utah vine milkweed has no federal status, but is listed by the BLM as a sensitive species. It is accorded a state ranking in California of S3.3 (see Table 4-10). The species is native to the Mojave Desert and is known from the states of Utah, Arizona, Nevada, and California

Utah vine milkweed is a member of the dogbane family (Apocynaceae). It is a small (up to about 1 meter), highly branched vine that grows up through other desert shrubs for support. It has small, narrow leaves, only a few centimeters long and bright yellow to orange flowers that grow in umbels. The plant typically grows on sandy to gravelly flats in creosote bush desert.

A single occurrence of the Utah vine milkweed was recorded during the rare plant survey. This occurrence was just southwest of the proposed Ivanpah Substation site.

Desert Pincushion (S2.2)

The desert pincushion cactus (*Escobaria vivipara* var. *deserti*) was formerly known as *Coryphantha chlorantha*, and appears in the CNDDB under this name. The desert pincushion cactus usually occurs as a single stem, but may be multi-stemmed. Plants seldom exceed six inches in height, with the flower color being variable. Flowers usually occur in April and May (Jepson 2008). The species occurs on carbonate soils between approximately 3,280 and 7,870 feet elevation.

A species of *Escobaria* cactus is present at several locations on the Project from the Mountain Pass Substation east for a distance of approximately 3.5 miles. Most of the occurrences are within 0.4 mile of the substation. These cacti represent either this species or the viviparous foxtail cactus (*Escobaria vivipara* var. *rosea*), but could not be decisively determined due to lack of flowers present on the plants at the time the Project rare plant survey was conducted. Flowers are required to discriminate between these two varieties of *E. vivipara*.

Viviparous Foxtail Cactus (S1, S2)

The viviparous foxtail cactus was formerly known as *Coryphantha vivipara* var. *rosea*). The range of this species includes northwestern Arizona, southern Nevada, and southeast California (Benson 1982). This cactus occurs on limestone substrates in piñon-juniper woodland or on low hills and slopes in Mojavean desertscrub between 4,100 and 8,860 feet elevation (Benson 1982; CNPS 2001; Jepson 2008). The plants may have one to several heads, and produce magenta to purplish blooms in May or June (Benson 1982; CNPS 2001). The species is considered rare, and is threatened by over-collection (Hickman 1993; Jepson 2008).

The viviparous foxtail cactus could occur in the Clark Mountains, and it may be the species that is present on the site, as mentioned above under the discussion of the desert pincushion.

Nine-awned Pappus Grass (S2?)

Nine-awned pappus grass occurs on calcareous soils, usually associated with slopes or rocky crevices in desert woodland habitat between approximately 4,180 and 5,990 feet elevation. The species ranges from Colorado and southern California east to west Texas, and south to Peru. Plant stems may reach about 20 inches in height, with the inflorescences present in August and September (Gould 1951; Jepson 2008).

Nine-awned pappus grass was found during the Project rare plant survey conducted in May of 2008. A single occurrence of this species was recorded 2.2 miles southwest of the proposed Ivanpah Substation site.

California Barrel Cactus (BLM)

The California barrel cactus has no federal status under the ESA, is not listed on the California BLM list of sensitive species, and is not afforded any status in the CNDDB (it is not tracked), and was considered too common to be included in the CNPS Inventory of Rare and Endangered Plants of California (2001). The Needles Office of the BLM has expressed some concern for the species in its district.

This cactus and its varieties occur widely in Arizona, Nevada, California, and Utah in desert habitats. The plants prefer gravelly to rocky hillsides, canyon walls and wash margins in the desert between about 200 and 5,000 feet. In the current taxonomy there are two varieties that could be present in the Project area; var. *lecontei* occurs from roughly between 2,500 and 5,000 feet while var. *acanthodes* occurs between 200 and 1,500 feet elevation.

This species was not on the target list for rare plant studies, but it was found in moderate density along the Project ROW in California west of Ivanpah Lake.

Parrish Club Cholla (Matted Cholla) (S2.3)

Parrish club cholla has no federal status, but is considered a sensitive species by the BLM. It is accorded a State of California ranking of S2.3 (see Table 4-10). The species is known from the Mojave and Sonoran Deserts of Arizona, California, and Nevada.

Parish club cholla grows in mats, hence the alternate common name of "matted cholla." The mats are close to the ground and this cactus never "emerges" from the shrubby desert vegetation surrounding it. Plants flower in late spring and early summer and are usually found on silty, sandy, or gravelly flats, dunelets and hills.

Parish club cholla was found on the proposed Ivanpah Substation site and at four other locations in California during rare plant surveys in May 2008 (see rare plant survey; Appendix C of the Biological Summary Resource Report).

Hairy-podded Fine-leaf Hymenopappus (S1.3)

Hairy-podded, fine-leaf hymenopappus (*Hymenopappus filifolius* var. *eriopodus*) has a CNDDB state ranking of S1.3. This species inhabits limestone soils among pines and/or junipers at elevations of about 1,600 to 1,700 meters (5,250 to 5,580 feet) (Jepson 2008). Plants may reach 8 decimeters (30 inches) in height and produce whitish flowers in May or June, and occasionally again in the fall (October) (Jepson 2008). This species is recorded in the Clark and New York mountains. This species is unlikely to occur within the transmission line ROW, but could occur near the Mountain Pass Substation.

Hillside Wheat Grass (S1.3)

Hillside wheat grass (*Leymus salinus mojavensis*) has a CNDDB state ranking of S1.3. Hillside wheat grass grows to about 14 decimeters (55 inches) in height with an inflorescence to 14-centimeters (5.5-inches) long, and flowers between May and June. This grass occurs on rocky hillsides in piñon-juniper habitat between 1,350 and 2,135 meters (4,430 and 7,000 feet) elevation (CNPS 2001; Jepson 2008). The only portion of the Project ROW where this species might occur is the vicinity of the Mountain Pass Substation.

Plains Flax (S2.3)

Plains flax (*Linum puberulum*) inhabits dry ridges of deserts, mesas, or mountains from California to Colorado and Texas (Jepson 2008). Plains flax is a perennial species to about 15 inches in height, which may occur between approximately 2,000 and 8,200 feet elevation (Epple and Epple 1995; Jepson 2008; Kearney and Peebles 1960). The flowers, which have yellow to orange petals, may bloom anytime between April and October (Epple and Epple 1995; Jepson 2008).

Plains flax was not observed on the Project during any of the Project surveys, but is likely to be present in some areas.

Rough Menodora (S2.3)

Rough menodora (*Menodora scabra*) is a shrub to about 18 inches in height that produces light canary yellow flowers anytime between May and September, which are followed by distinctive translucent, paired fruit (Epple and Epple 1995; Kearney and Peebles 1960). Rough menodora occurs on rocky soils of slopes, dry mesas, foothills, and canyons between approximately 1,500 and 7,500 feet elevation (Jepson 2008; Kearney and Peebles 1960). In California, rough Menodora is recorded from the Clark, Eagle, and New York mountains (Jepson 2008).

Rough menodora has not been observed during any of the Project surveys but may occur within the Project limits on the east flank of the Clark Mountains.

Polished Blazing Star (S1.2)

The polished blazing star (*Mentzelia polita*) has a CNDDB state ranking of S1.2. Polished blazing star is a perennial plant to about 31 centimeters (1-foot) in height with white, peeling stems and linear to lanceolate leaves less than 7 centimeters (2.75 inches) in length. The white to pale yellow flowers appear in April or May (Charters 2008). The plants occur on limestone or gypseous soils between 1,200 and 1,500 meters (3,940 and 4,920 feet) elevation. The polished blazing star is known from the Clark Mountains (Charters 2008; Jepson 2008). This species could occur on suitable substrate on the Project in the Clark Mountains.

Red Four O’clock (S2.3)

Red four o’clock (*Mirabilis coccinea*) has ascending to erect stems to nearly 2 feet in height. The fleshy, linear leaves are sessile, and the intense red blossoms may be present between May and July (Jepson 2008). This plant occurs on dry soils of rocky slopes and along washes, often associated with piñon-juniper habitat, between approximately 3,510 and 5,900 feet elevation (CNPS 2001; Jepson 2008).

Red four o’clock was not observed during any of the Project surveys, but suitable habitat for the species is present near the Mountain Pass Substation.

Tough Muhly (S1, S2)

Tough muhly (*Muhlenbergia arsenei*) has a CNDDB state ranking of S1/S2. This perennial grass may reach 4 decimeters (16 inches) in height with a 12 centimeters (4.7 inches) long inflorescence that may be present from August to October. Tough muhly occurs on rock outcrops and limestone slopes in the Clark and New York mountains between 1,400 and 1,860 meters (4,590 and 6,100 feet) (CNPS 2001; Jepson 2008). Tough muhly could be present in the Project area near the Mountain Pass Substation.

Curved-spine Beavertail (S1.2)

The curve-spined beavertail cactus (*Opuntia curvospina*) has a CNDDB state ranking of S1.2. The curve-spined beavertail cactus, also known as the Searchlight pricklypear, is a recognized hybrid between tulip and dollarjoint pricklypears (*O. phaeacantha* and *O. chlorotica*) that has been proposed as a distinct species (CNPS 2001; USDA 2008). The species occurs in Mojavean desertscrub, chaparral, and piñon-juniper woodland from 3,280 to 4,590 feet elevation (1,000 to 1,400 meters). Blooms appear on the plants between April and June (CNPS 2001). The curve-spined beavertail cactus could be present within the Project limits in suitable habitat.

Spiny Cliffbrake (S2)

Spiny cliffbrake (*Pellaea truncata*) occurs in rock crevices, on cliffs, and in boulder piles of granite or other igneous rocks in piñon-juniper habitat between approximately 3,900 and 7,050 feet elevation (CNPS 2001; Jepson 2008).

Spiny cliffbrake was not observed during any of the Project surveys, but suitable habitat may be present in the steep, rocky terrain near the Mountain Pass Substation.

Rosy Two-toned Beardtongue (S1.3)

The rosy two-toned beardtongue has no federal status and is not listed as a BLM sensitive species in California. The State of California assigns it a rank of S1.3 (less than six element occurrences with no identifiable threat).

This species is known from three occurrences in California; one east of Keany Pass on the Clark Mountain USGS Quad, one near Heart in the Castle Mountains on the Heart Peak USGS Quad, and one vague location on the Homer Mountain USGS Quad, all in San Bernardino County. The Keany Pass location was situated in a limestone wash, which follows most of the Nevada and Arizona sites for this plant – it is a calcareous soil obligate or near-obligate. Plants are perennial herbs up to about 5 feet tall, leaves have strongly toothed margins and are clasping. The corolla is trumpet-shaped and the flowers are rose to rose-purple.

This species was on the target list for rare plant surveys in the California portion of the Project area, but no individuals of this species were found in California during the spring 2008 survey.

Stephens' Penstemon (BLM)

Stephens' penstemon (*Penstemon stephensii*) occurs on rocky slopes or in bedrock crevices, and along washes, usually associated with carbonate soils, in habitats from creosote bush scrub up to piñon-juniper at elevations ranging from approximately 3,800 to 6,070 feet elevation. The rose to magenta flowers may be present between April and June (CNPS 2001; Jepson 2008).

Stephens' penstemon has not been observed during any of the Project field surveys, but suitable habitat is present in the Project area.

Aven Nelson's Phacelia (S2.3?)

Aven Nelson's phacelia is an annual herb that occurs on carbonate, sandy or gravelly soils in a variety of habitats between approximately 3,900 and 4,920 feet elevation (Jepson 2008). The species is known in southern California only from the New York Mountains, but the species range extends to southwest Utah. It is an erect annual plant to about 20 inches in height, with white or pale blue to lavender flowers that may be present in April or May (CNPS 2001; Jepson 2008).

Aven Nelson's phacelia was observed at four closely spaced localities on the Project, about 1.0 mile northeast of the Mountain Pass Substation during the rare plant survey conducted in May of 2008.

Sky-blue Phacelia (S2.3)

The sky-blue phacelia is an ascending to erect annual herb to about 16 inches in height. The plants inhabit sandy to rocky soils, from creosote bush desert to piñon-juniper habitats between approximately 2,000 and 6,560 feet elevation. The pale bluish to purple flowers may be present from April to May (CNPS 2001; Jepson 2008; Kearney and Peebles 1960).

The sky-blue phacelia was observed on the Project as a single occurrence approximately 2.8 miles northeast of the Mountain Pass Substation. The species is likely to exist at other locations within the Project area.

Chamber's Physaria (S2.3)

Chamber's physaria (*Physaria chambersii*) is an herbaceous tufted plant that is usually no more than six inches in height. Leaves are basal and spatulate with an acute tip. Chamber's physaria is a limestone soil endemic species that occurs between approximately 4,920 and 8,500 feet elevation, usually associated with piñon-juniper habitat. The species is recorded from the Clark and Grapevine Mountains in California, and occurs north to Oregon, east to Utah and Arizona. The yellow flowers usually appear in April or May (CNPS 2001; Jepson 2008; Kearney and Peebles 1960).

Chamber's physaria was not observed during the Project rare plant survey, but there may be suitable habitat for the species in the Clark Mountains.

Abert's Sanvitalia (S1, S2)

Abert's sanvitalia has a CNDDB state ranking of S1/S2. Abert's sanvitalia is an annual plant occurring on dry slopes in piñon-juniper woodland from 5,150 to 5,900 feet elevation (CNPS 2001; Jepson 2008). Plants may reach 11 inches (29 centimeters) in height (Jepson 2008). The yellow flowers are present in August or September. In California the species is known from the Clark and New York mountains (Jepson 2008). There is a small chance that Abert's sanvitalia might occur on the Project in the vicinity of the Mountain Pass Substation.

Rusby's Desert Mallow (BLM, S1.3)

Rusby's desert mallow (*Sphaeralcea rusbyi* var. *eremicola*) has a CNDDB state ranking of S1.3. Rusby's desert mallow occurs in Joshua tree woodland and Mojavean desertscrub habitats between 3,200 and 4,920 feet elevation (CNPS 2001; Jepson 2008). The species is relatively short for a *Sphaeralcea* sp., reaching only about 12 inches (3 decimeters) in height. Rusby's desert mallow occurs only in Death Valley and the Clark Mountains (Jepson 2008). There are CNDDB records of this species in the vicinity of the Kally Mine and Stateline Pass area, which are west/northwest of the north end of Transmission Line Alternative C. There is some possibility this species could occur within the Project limits near the Mountain Pass Substation.

Special Status Wildlife Species – Nevada Segment

California Leaf-nosed Bat (BLM, ART)

The California leaf-nosed bat (*Macrotus californicus*) is primarily a resident of caves and mines in desertscrub habitat, generally below 3,280 feet in elevation (Barbour and Davis 1969; Hoffmeister 1986; Western Bat Working Group [WBWG] 2005). These bats utilize a variety of night roosts, such as open buildings, porches, bridges, rock shelters and mines (Harvey et al. 1999). They require relatively warm winter roost sites because they do not hibernate and cannot tolerate temperatures below 60 degrees Fahrenheit for more than a few hours (Hoffmeister 1986). Approximately 20 maternity colonies, and fewer than 20 winter roost sites, all located in mines, are known in California, mostly in mountains bordering the Colorado River Basin (Brown et al. 1993).

The California leaf-nosed bat feeds mostly on large night-flying beetles and moths, which they take in flight. They also consume grasshoppers and insect larvae, especially of moths, which they take off of bushes or from the ground. They also eat fruit, including those of cacti (Hoffmeister 1986). There is evidence that the California leaf-nosed bat may utilize the same roost throughout its life (Brown et al. 1993). They do not forage far from their roosts. Several foraging flights are performed during the night, the bats returning to the roost to consume larger prey (Barbour and Davis 1969). Threats to this species include mine closures, vegetation removal, vandalism at roosts, and prolonged exposure to low temperatures (Brown et al. 1993).

The Nevada portion of this Project is within the generally accepted range of the California leaf-nosed bat (Barbour and Davis 1969; Bat Conservation International [BCI] 2008; Harvey et al 1999; NMNH 2008), and the species could occur within the Project area where suitable mine or cave roost habitat is present. There is very little evidence of historic mining on Sheep Mountain, in the Lucy Gray Mountains, or in the north McCullough Pass area. Mine adits or shafts suitable for bat roosts are unlikely to be present in these areas. Large solution pockets or small caves on Sheep Mountain and eroded gas pockets in igneous strata in the Lucy Gray and McCullough Mountains could support small numbers of roosting bats if the voids are of adequate depth to maintain the proper roost temperature range required.

The proposed fiber optic communication line on the Eldorado-Lugo transmission line passes through an area of intense historic mining activity in the south end of the South McCullough Mountains and the north end of the New York Mountains near the Big Tiger Wash and Nevada

State Highway 164. There are numerous abandoned mine adits and shafts in the area that may contain suitable roosting habitat for this species. The status of these features is not known.

California Myotis (BLM, ART)

The California myotis (*Myotis californicus*) roosts in a variety of habitats including rock crevices, under loose bark and within holes in trees, in buildings, and occasionally in caves or mines (Harvey et al. 1999; Hoffmeister 1986). They are primarily residents of desertscrub, or encinal habitats, but do go as high as the lower edge of conifer zones, though rarely above 6,000 feet. In all situations in the southwestern deserts they usually occur near a water source, often in rocky riparian canyons (Barbour and Davis 1969; Hoffmeister 1986).

There is only marginally suitable habitat present in the Nevada portion of the Project that may support this species. They would be most likely to occur within the Project limits only during nocturnal foraging activity.

Townsend's Big-eared Bat (BLM, ART)

Townsend's big-eared bat (*Plecotus townsendii*) occurs throughout the western United States west of the Great Plains, north into British Columbia, and south to Oaxaca in Mexico (Barbour and Davis 1969; BCI 2008; Harvey et al. 1999). The Pale Townsend's Big-eared Bat (*P. t. pallescens*) is restricted to the desert southwest (Barbour and Davis 1969), and is the subspecies that would occur within the Project area. Pale Townsend's big-eared bats normally roost in mines or caves, and they typically return to the same roosts each year (Harvey et al. 1999). It is probably the bat species most frequently encountered in caves and mines in the western United States (Barbour and Davis 1969). The pale big-eared bat is found from low desert up into coniferous forest (Hoffmeister 1986). Colonies of pale big-eared bats usually occur in groups of about a dozen, up to a couple of hundred bats (Barbour and Davis 1969; WBWG 2005). Many references have stated that the pale big-eared bat prefers moths to other prey (Barbour and Davis 1969; Harvey et al. 1999; WBWG 2005). However, other records indicate a variety of prey in their diet (Schmidly 1991).

Townsend's big-eared bat would be likely to use similar habitats that the California leaf-nosed bat would find attractive. The abandoned mines in the Big Tiger Wash area would be the most likely place for this species to occur within the Nevada portion of the Project.

Big Free-tailed Bat (BLM, ART)

The big free-tailed bat (*Nyctinomops macrotis*) is found from the southwestern United States, as far north as central Utah and Colorado, south to northern South America, and east to the Caribbean (Harvey et al. 1999; Hoffmeister 1986). The big free-tailed bat is probably at the northern limit of its normal range in the southwestern United States (Harvey et al. 1999). The big free-tailed bat is apparently uncommon within its range in the United States in general, but may be locally common, and records for this species are often of individual bats from widespread locations (Barbour and Davis 1969). Maternity colonies are known in the United States from Arizona, New Mexico, and from Big Bend National Park on the Rio Grande River, in Texas

(Hoffmeister 1986; Schmidly 1991). The big free-tailed bat roosts among rocky, usually high cliffs in crevices, rock shelters, under slabs of rock, and occasionally in buildings (Harvey et al. 1999; Hoffmeister 1986).

The big free-tailed bat could use natural bedrock cavities or fractures in cliffs in the north McCullough Pass area, or in the Lucy Gray Mountains, or on Sheep Mountain. There is only a low probability that this species occurs in the area, and their presence within the Project area would likely be limited to nocturnal foraging activities.

Desert Bighorn Sheep (BLM)

A general discussion of the desert bighorn sheep is given for the California portion of the Project above. Specific to the Nevada portion of the Project, desert bighorn sheep are present in the McCullough Range, including the north McCullough Pass area through which the transmission line alignment passes.

The Nevada office of the BLM considers the desert bighorn sheep a sensitive species. The desert bighorn sheep is managed as a big game animal in Nevada by the NDOW, and an annual hunt allows for a very limited take of the species. The McCullough Mountains are within the NDOW Area 26 Unit 263 hunting area. The 2008 quota for Bighorn for Unit 263 is set at 10 animals, and the hunt period in Unit 263 is from November 10 through December 10. The NDOW would likely restrict construction of this Project through the McCullough Mountains during the bighorn hunting season.

Within the Project area in Nevada, Nelson's bighorn is likely confined to the rugged, upland topography associated with the McCullough Range. Within that range are bighorn special use areas that are of concern to wildlife and land managers. Lambing grounds are generally higher elevation portions of mountain ranges where ewes go in the winter or spring to drop their lambs. It is believed that the higher, less accessible terrain affords the ewes and lambs greater protection from certain predators such as Coyotes. Summer grounds are those portions of the mountain range occupied by sheep during the hot summer months. Summer grounds must provide adequate forage and not be at too great a distance from water. The only water development in the McCullough Mountains available to bighorn sheep in summer is the "Linda" guzzler, approximately 1.3 miles north of the north McCullough Pass. Because bighorn mostly move during daylight, which is when construction would occur, there is potential for Project activities to interfere with bighorn accessing this resource. Construction of the portion of the line through the north McCullough Pass area should occur outside of the hot summer season (June through September) when bighorn may be dependent on this water source.

The BLM *Rangewide Plan for Managing Habitat of Desert Bighorn Sheep on Public Lands* identifies the McCullough Mountains as a Category II (Crucial Habitat) area. Continuous suitable habitat for bighorn sheep exists from the McCullough Range to the southeast including the nearby Highland Range Crucial Bighorn Habitat Area (approximately 7.0 miles south-southeast of the proposed transmission line alignment through the McCullough Mountains). The proximity of the two ranges, with the relatively narrow, high valley in between, is favorable to regular movements of bighorn sheep between the two ranges. The Eldorado-Lugo 500kV transmission line, which will support the fiber optic communications line, passes through this habitat between the two ranges, but does not enter either the South McCullough Wilderness Area or the

Highland Range Crucial Bighorn Habitat Area. The population of Bighorn Sheep in the McCullough Range was estimated at approximately 200 animals in 2002 (Cummings 2002). Bighorn were observed along the Project alignment in the north McCullough Pass area by SCE personnel in August of 2008. Bighorn may also be present on Sheep Mountain and the Lucy Gray Mountains. The transmission line ROW passes between these two ranges east of I-15 and north of Primm, Nevada.

Raptor Nests

There is a general lack of natural potential roosting and nesting habitat for raptors along most of the Nevada portion of the Project. There is some potential nesting habitat in the north McCullough Pass area where there is rocky terrain that might support cliff nesting species. Electrical transmission line lattice towers probably provide most of the potential raptor nesting habitat in the area. No raptor nests were observed in any of the lattice towers along the proposed transmission line route or any of the existing lattice towers on the Eldorado-Lugo line. Stick nests in lattice towers are often re-occupied or modified and re-used intermittently by raptors and corvids returning to an area annually. The nests are generally persistent on the towers for years. An apparent lack of stick nests in lattice structures along the existing transmission line may reflect depressed raptor populations in the area. A pre-construction survey for raptor/corvid nests in the existing lattice towers should be performed prior to initiation of construction. Burrowing owls may occur anywhere where the ground surface is relatively flat, vegetation is low and typically sparse, and burrowing animals that provide burrows which can be modified for use by the birds.

Migratory Bird Treaty Act

The principal potential impacts that might result in violation of this law are associated with activities that would destroy nests, eggs, and young birds during the nesting season. In the Project area the avian nesting season for most species is from late February to early July.

Western Burrowing Owl (BLM, NRS 501)

A discussion of the ecology of burrowing owls is given above in the section on the California portion of the Project. Suitable habitat for burrowing owls is probably present in several areas of the Nevada portion of the Project, particularly where animal burrows, especially those of desert tortoise are common. Burrowing owls have not been observed within the Nevada limits of the Project, but are likely to be present.

Peregrine Falcon (BLM, NRS 501)

Peregrine Falcons (*Falco peregrinus*) inhabit open wetlands near cliffs, and they can also be found living in cities with tall buildings or bridges (National Geographic Society [NGS] 2002). General breeding habitat for this species includes open areas from tundra, savanna, and seacoasts to high mountains, as well as open forest and tall buildings (Ehrlich et al. 1988). Their diet is solely comprised of birds, which they catch in mid-air (Phillips et al. 1964). They eat mostly doves and pigeons, but also waterfowl, shorebirds, and passerines (Ehrlich et al. 1992).

The Peregrine falcon occurs in the McCullough Mountains, and it is possible that the species breeds there (Floyd et al. 2007).

Prairie Falcon (BLM)

The prairie falcon (*Falco mexicanus*) is typically found in very open habitats in perennial grasslands, rangeland, and light agricultural areas, but is present in the southeast deserts in California as well (Dawson 1998; Wheeler 2003). The prairie falcon is known to nest almost exclusively on sheltered cliffs. The nests are usually on a rock ledge that is overhung, or in a crack, and the nest always faces open habitat (Ehrlich et al. 1988; Steenhof 1998; Wheeler 2003). However, there are a few records of these birds nesting in earthen embankments (Ehrlich et al. 1988). While they may nest near riparian areas, they do not require the presence of water (Wheeler 2003). They do not construct their own nest, but utilize an old avian nest or scrape together soil, rocks, and sticks to construct their eyrie (Dawson 1998; Wheeler 2003). The eyries may be reused annually for many years (Wheeler 2003).

The Prairie Falcon probably occurs in the vicinity of the McCullough Mountains, but there are no records of the species breeding in the range (Floyd et al. 2007).

Phainopepla (BLM, NRS 501)

The Phainopepla (*Phainopepla nitens*) is a member of the silky-flycatcher family, Ptilogonatidae, a primarily tropical family of birds. The Phainopepla possesses a sharp crest and eyes that have a red iris. The males are uniformly glossy black with a distinct white wing patch in flight. The females and juveniles are a uniform medium gray color (NGS 2002). The Phainopepla feeds on a variety of berries and insects. In desertscrub habitats mesquite mistletoe berries are an important food source, and are an attractant to the species. In other areas they feed on juniper, elderberry (*Sambucus* spp.), grape (*Vitis* spp.), buckthorn (*Rhamnus* spp.), Russian olive, and other berries. They forage for insects in typical flycatcher fashion, repeatedly launching out from a high perch to retrieve an insect and returning to the perch (Chu and Walsberg 1999; NatureServe 2008).

The Phainopepla typically nests twice a year, but occasionally three broods are produced (NatureServe 2008). The first nest of the year is produced in low desertscrub or mesquite (*Prosopis* spp.) habitat. As the warmer weather approaches, the Phainopepla moves to higher elevations into piñon-juniper or oak (*Quercus* spp.) forest where it will nest a second time. Nests are constructed mostly by the male and are usually in a tree or occasionally in a shrub (Chu and Walsberg 1999; NatureServe 2008). The Phainopepla is a confirmed breeding species in the McCullough Mountains (Floyd et al. 2007).

The creosote bush-white bursage habitat on much of the Project is mostly unfavorable to the presence of Phainopeplas. There are very few trees associated with desert arroyos in the area, but a few small stature catclaw acacia are present, and some support mesquite mistletoe. Two Phainopeplas were observed during site visits to the Project conducted in 2008.

Loggerhead Shrike (BLM)

The loggerhead shrike (*Lanius ludovicianus*) is widely distributed across the United States. It is found in a variety of habitats, which generally include open country, thinly wooded or shrubby areas with clearings, meadows, pastures, old orchards, and thickets along roadsides (Terres 1980). In California, this species may be found in desert, piñon-juniper woodland, savannah, grassland, ranches, and agricultural land (Small 1977). Loggerhead shrikes feed primarily on large insects, but they frequently eat small birds, mice, lizards, amphibians, carrion, and other invertebrates (Ehrlich et al. 1988). Populations of this species appear to be declining almost everywhere throughout its range, with the probable causes being habitat loss and pesticides (Ehrlich et al. 1988). The Loggerhead Shrike is relatively common in the lower elevations of southern California, including deserts, foothills, the Salton Sea, and the Colorado River (Schram 1998). The loggerhead shrike is a resident throughout the state of Nevada and is considered probable that it nests in the McCullough Mountains (Floyd et al. 2007).

The loggerhead shrike has been observed on the California segment of the Project, but not on the Nevada segment. It is likely to be present on the Nevada segment as suitable habitat for the species is present in several areas.

Desert Tortoise (FT, NRS 501)

A general discussion of the desert tortoise is given above in the section of the PEA that covers the California portion of the Project. The transmission line route through the McCullough Mountains traverses approximately 6.0 miles of Critical Habitat in the Piute-Eldorado DWMA of the Northeastern Mojave Recovery Unit for the Mojave population of the desert tortoise (Figure 4.4-4, located in Map Volume). This encompasses land on the east side of the McCullough Range from the crest of the north McCullough Pass east to the east boundary of Section 9 of Township 25 South, Range 62 East. West of the crest of the north McCullough Pass suitable desert tortoise habitat is present until the route reaches the edge of the Roach Lake dry playa.

Almost the entire 30-mile length of the portion of the Eldorado-Lugo 500kV Line that will support the fiber optic line (Eldorado Substation to Highway 164) is within suitable habitat for the desert tortoise. Only the higher elevations in black bush habitat are probably not favorable for tortoises. Approximately 2.0 miles south of the Eldorado Substation the Eldorado-Lugo line enters the Piute-Eldorado, Nevada unit of designated Critical Habitat for the Mojave population desert tortoise. The line is within this unit continuously for approximately 9.0 miles to the south.

A Project protocol level survey for the desert tortoise was performed by Karl and Associates in May of 2008 for the proposed transmission line route. It is anticipated the transmission line alternative routes and the telecommunication routes will be surveyed in the spring of 2009, after the alternative corridors are more precisely defined. Because of the more limited potential impacts associated with placement of the fiber optic communications line along existing transmission (Eldorado-Lugo 500kV) and distribution (Nipton 33kV) lines, protocol surveys will not be required for the entire telecommunication route and will focus on areas of ground disturbance associated with cable pulling and tensioning sites, tower retrofit construction areas, and other construction areas. Pre-construction clearance surveys for Mojave desert tortoises and presence of construction monitors during cable installation may provide adequate protection for desert tortoises.

The desert tortoise has been observed and is likely to occur anywhere in the Project where suitable habitat is present. The tortoise survey results are located in the appendices to the project Biological Resources Summary Report.

Chuckwalla (BLM)

The chuckwalla (*Sauromalus ater*) is restricted to rocky areas in desert flats, hillsides, and mountains, where crevices are available for shelter (Brennan and Holycross 2006). Creosote bush is common throughout its range (Stebbins 2003). Chuckwallas are primarily herbivorous, eating a variety of desert annuals and perennials, but they occasionally eat insects (Brennan and Holycross 2006; Sherburn 1972; Stebbins 2003). The common chuckwalla is widely distributed across western Arizona, southern Nevada, southeastern California, Baja California, and northwestern Sonora.

The chuckwalla is likely to occur anywhere in the Project area where suitable rocky habitat is present. They have been observed on the Project in the north McCullough Pass area.

Gila Monster (BLM, NRS 501)

The Gila monster occurs from southern Nevada and extreme southwestern Utah west to southern California, through Arizona, to northern Sinaloa, Mexico (Beck 2005; Stebbins 2003). Gila monsters are largely a species of the Sonoran Desert: in the United States, the Gila monster occurs generally as a peripheral species in California, Nevada, Utah, and New Mexico, with the bulk of its range in Arizona. In Nevada, the species occurs in Clark, Lincoln, and Nye counties (NNHP 2004).

Gila monsters prefer undulating rocky foothills, bajadas, and canyons, and tend to avoid open sandy plains (Beck 2005). The daily timing of Gila monster activities varies according to season and locality (Beck 2005). When averaged throughout the year, Gila monster activity shows a bimodal pattern (Beck 2005). Estimates for the amount of surface activity are low: in Utah, Gila Monsters may spend only 65 hours per year above ground, and in Arizona, that figure may be from 190 to 670 hours (Beck 2005; Lowe et al. 1986). Thus, in some locations they may spend up to 98 percent of their time in burrows (Brown and Carmony 1991; Ivanyi et al. 2000). However, recent telemetry studies indicate that Gila monsters move much more than expected when they are active (Beck 2005). Home range estimates vary from an average of 34.8 ha in Utah to 64.2 ha in Nevada (Beck 2005).

Gila monsters use a “search and dig” strategy to forage for nests, and have a varied diet that includes newborn rodents and rabbits, lizards, ground-nesting birds, carrion, and eggs from birds and reptiles (Beck 2005; Ivanyi et al. 2000; Lowe et al. 1986), and may be the most important predator of desert tortoise nests near Tucson, Arizona (Stitt et al. 2003).

No Gila monsters have been observed on the Project to date. There is suitable habitat present for Gila monsters in the Nevada portion of the Project in rocky ravines and upper bajada habitats. The species may occur in the Project area, but their numbers are likely to be low. They are unlikely to be observed due to their often crepuscular activity regime and limited time spent on the surface during the year.

Western Banded Gecko (MSHCP)

With its soft, pliable skin, the western banded gecko (*Coleonyx variegatus*) would seem poorly suited to life in extremely arid situations, but its nocturnal and subterranean habits allow it to thrive in arid environments such as creosote bush desert and desertscrub habitats (Stebbins 2003). They feed on a variety of arthropods, primarily insects (Degenhardt et al. 1996; Stebbins 2003). The western banded gecko very likely is present somewhere along the ROW, and because of its habitat flexibility regarding acceptable soil types and elevation, it could be present anywhere along the Project route (Degenhardt et al. 1996).

Desert Iguana (MSHCP)

The desert iguana (*Dipsosaurus dorsalis*) is primarily an inhabitant of creosote bush habitat, where it is often active in the heat of the day. Creosote bush provides shelter from heat and predators, and its flowers are a staple in the diet of the desert iguana. The desert iguana is primarily herbivorous and often accesses food plant materials by climbing up into creosote bushes or other vegetation. They will also eat insects and carrion (Ivanyi et al. 2000; Stebbins 2003). The desert iguana is likely to be present along much of the Project ROW, particularly in creosote bush habitat. The species was documented at the proposed ISEG site adjacent to the California segment of the Project (CEC 2008).

Black Collared Lizard (MSHCP)

The black collared lizard (*Crotaphytus insularis*) tends to prefer rocky habitat with generally sparse vegetation, but has been recorded in less rocky areas. They eat primarily insects, but will take other lizard species and some plant materials (Stebbins 2003). The black collared lizard is probably not common along the Project ROW, but if it is present, it would most likely be found along the portion of ROW that passes through the McCullough Mountains where the terrain is hillier and some rock is present. The species was documented at the proposed ISEG site in the California segment of the Project (CEC 2008).

Long-nosed Leopard Lizard (MSHCP)

The long-nosed leopard lizard (*Gambelia wislizenii*) is a rather large lizard that can be quite variable in coloration. This lizard prefers mostly open country, and will occur on a variety of substrates and in many vegetation communities such as creosote bush, sagebrush (*Artemisia* spp.), or other low scattered plant groupings (Stebbins 2003). It may occur in rocky areas, but the presence of rocks is not a requirement for the species (Degenhardt et al. 1996). The Long-nosed leopard lizard eats a variety of prey including insects, lizards, and snakes, but because of its large size, it is even capable of taking small rodents (Degenhardt et al. 1996; Stebbins 2003). It also consumes some plant materials (Stebbins 2003). The long-nosed leopard lizard is likely to be present almost anywhere along the Project ROW. Its presence in the creosote bush habitat at the bases of the mountains would be expected. The species was documented at the proposed ISEG site adjacent to the California segment of the Project (CEC 2008).

Western Leaf-nosed Snake (MSHCP)

This snake is not uncommon in creosote bush desert, but is not often observed. These snakes seldom exceed 20 inches in length, and have an enlarged rostrum that aids in digging. The western leaf-nosed snake (*Phyllorhynchus decurtatus*) occurs in desertscrub habitat, and is typically associated areas where creosote bush is dominant. Their principal foods are various species of lizards including the western banded gecko (Stebbins 2003). The western leaf-nosed snake is likely to be present along the Project ROW in areas where creosote bush is the dominant plant. This snake probably would not be present where the Project passes through the McCullough Mountains.

Glossy Snake (MSHCP)

The glossy snake (*Arizona elegans*) is found in sparsely vegetated or barren desert, grasslands or chaparral-covered slopes where it is primarily active at night (Degenhardt et al. 1996; Stebbins 2003). While it is an efficient burrower, it readily utilizes burrows of other animals or spaces beneath rocks for shelter. The glossy snake is more common at lower elevations, and is often found associated with Western (*Crotalus viridis*) and diamondback (*C. atrox*) rattlesnakes (Degenhardt et al. 1996). They eat primarily lizards, but snakes, small mammals and birds are also taken (Degenhardt et al. 1996; Stebbins 2003). The glossy snake may be present anywhere along the Project ROW.

Common Kingsnake (MSHCP)

The common kingsnake (*Lampropeltis getula*) is present through a wide range of habitats and elevation from sea level to near 7,000 feet (Degenhardt et al. 1996; Stebbins 2003). In desert habitats it uses rock shelters, animal burrows or manmade structures to escape high temperatures and low humidity (Degenhardt et al. 1996). They feed primarily on other snake species, but also consume lizards, frogs, birds and eggs of reptiles and birds (Degenhardt et al. 1996; Stebbins 2003). The common kingsnake is likely to occur within the Project ROW, and is more likely to be found in the McCullough Mountains portion of the corridor than in the creosote bush dominated flats.

Long-nosed Snake (MSHCP)

The long-nosed snake (*Rhinocheilus lecontei*) is typically a snake of valleys or low rolling hills where grasses or thick vegetation and little rock are present (Degenhardt et al. 1996). The primary prey of the long-nosed snake are lizards and small mammals, but they will also take snakes, reptile eggs, insects and occasionally birds (Degenhardt et al. 1996; Stebbins 2003). The long-nosed snake is likely to be present along the ROW among the low shrubby vegetation present where the line crosses the McCullough Mountains.

Lyre Snake (MSHCP)

The range of the lyre snake (*Trimorphodon biscutatus*) barely extends into southern Nevada. It tends to prefer steeper slopes and rocky terrain of canyons and arroyos, but may occasionally be encountered on valley floors (Degenhardt et al. 1996; Stebbins 2003). They may occur in a variety of vegetation types from sea level to almost 8,000 feet elevation (Stebbins 2003), and prey mainly on lizards but also takes snakes, birds and small mammals, including bats, which it seeks out in their roosts (Degenhardt et al. 1996; Stebbins 2003). The presence of the lyre snake within the ROW is possible, but not highly likely due to a general lack of rocky, shrubby terrain, which would provide good cover for this species.

Speckled Rattlesnake (MSHCP)

The speckled rattlesnake (*Crotalus mitchellii*) appears to prefer rocky habitats, but may also occur in areas of non-cohesive soils, and even in sandy habitats. The speckled rattlesnake is present in creosote bush, succulent desert, thornscrub, and up into piñon-juniper woodland. This rattlesnake preys primarily on small mammals, birds, and lizards (Stebbins 2003). The speckled rattlesnake is likely to be present anywhere along the Project ROW, and is not likely to be restricted to any specific habitat type.

Sidewinder (MSHCP)

The sidewinder (*Crotalus cerastes*) is not a large snake, usually less than three feet in length, and is usually found in areas of aeolian sands where plants such as creosote bush or mesquite have developed tumuli that support the burrowing rodents that are its main prey. The sidewinder is not restricted to sandy areas, and may occur on hardpan or even rocky hillsides (MacMahon 1985; Stebbins 2003). The “stepped” tracks it leaves in sand are characteristic of its method of locomotion. The supraocular scales are enlarged and hornlike, and have evolved to protect its eyes when it buries itself in sand or as it moves through burrows. The principle prey of the sidewinder are rodents and lizards, but birds may also be taken (Stebbins 2003).

The sidewinder is likely to be present along the ROW in areas of loose sand, and less likely on upper slopes as the Project route enters the McCullough Mountains. Sandy habitat near where the line passes between Sheep Mountain and the Lucy Gray Mountains would be possible habitat for the Sidewinder. The sidewinder was documented at the proposed ISEG site adjacent to the California segment of the Project (CEC 2008).

Mojave Rattlesnake (MSHCP)

The Mojave rattlesnake (*Crotalus scutulatus*) is more commonly found in upland desert and the foothills of the mountains in areas with mostly scattered vegetation, often in creosote bush or mesquite habitat, and usually not in very rocky habitat (Degenhardt et al. 1996; Stebbins 2003). The Mojave rattlesnake eats mostly small mammals, lizards, snakes and birds (Stebbins 2003). The Mojave rattlesnake is likely to be present anywhere along the Project corridor except in areas of where loose, sandy soils are prevalent.

Special Status Plant Species – Nevada Segment

White-margined Beardtongue (BLM, ART)

The white-margin beardtongue is a multi-stemmed perennial herb from rhizomes, 6 to 14 inches in height with distinctively white-margined, spatulate leaves. The tubular flowers, arranged in leafy whorls, appear from March to early June. The flowers are pink-to-lavender with darker purple markings. When dried, the flowers remain a purplish color (Arizona Rare Plant Committee [ARPC] no date; Jepson 2008; Smith 2001).

The white-margin beardtongue is currently known from 12 sites in Clark and Nye counties, Nevada (Smith 2001). The plants are also recorded from San Bernardino County, California (NNHP 2001b). In Nevada, the plants are generally restricted to deep, loose deposits of aeolian sands, or sandy alluvium along dry arroyos, low-profile slopes, or alluvial terraces at elevations ranging from 2,560 to 3,580 (5,890) feet (Smith 2001). All sites in Nevada are within either the creosote bush-bursage or Joshua tree-mixed shrub associations (NNHP 2001b; Smith 2001).

The white-margined beardtongue was located on the Project site during the May 2008 rare plant survey. Plants observed on the Project occur within an area designated as site 12 in Smith's treatise on this species (Smith 2001).

Rosy Twotone Beardtongue (BLM, ART)

The rosy twotone beardtongue is a perennial herb less than 60 inches in height with thick, ovate leaves 1.5 to 4.5 inches in length. The basal leaves are fused around the stem. The flowers, which appear from mid-March to mid-May vary from cream, to magenta, the corolla is from 0.7 to 1.1 inches in length. The plants are found in rocky soils of calcareous, granitic or igneous origin, in drainages, along roads, on scree at the bases of rock outcrops, and other places receiving enhanced runoff. The plants are found in creosote bush-bursage, black bush, and mixed shrub associations, at elevations from 1,800 to 4,840 feet (Jepson 2008; NNHP 2001a). The plant is known from Clark and Nye counties, Nevada, Mohave County, Arizona, and from California (Kearney and Peebles 1960; NNHP 2001a). There are at least 70 known sites for the species in Nevada, most of which are the rose-flowered phase (Smith 2005). The two subspecies of the twotone beardtongue (*P. b. bicolor* and *P. b. roseus*) are not considered valid taxa by Smith (2005), who includes them in *P. bicolor*.

The rosy twotone beardtongue was observed at several locations on the Project, primarily along the main drainage on the east flank of the north McCullough Pass area, and at a single locality along the Eldorado-Lugo 500kV transmission line corridor. Because of their stature, the plants stand out in the landscape, even when dormant, and the species is evidently widespread but uncommon in the Project area.

Construction Impacts and Mitigations

Would the Project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

<u>General Impacts</u>

With the exception of emergency situations, the construction, maintenance, and termination activities of this Project may be modified or curtailed in designated areas during sensitive periods (e.g., breeding, nesting, or lambing periods) by the BLM. The BLM may require an independent, third party construction inspection contractor (CIC) to oversee compliance with the terms and conditions of the Project approvals, permits, mitigation measures, ROW stipulations, and restoration activities.

Seventeen sensitive wildlife species and 29 sensitive plant species are known or potentially occur within the Project area. These species are discussed above in the Special Status Species portion of this section (Section 4.4.4 - Environmental Impacts and Mitigation Measures). Impacts to these species are discussed in the Phase Specific Impacts section below. The following discussion includes general Project biological mitigations that would further reduce impacts to sensitive species.

Bats

No sensitive bat species are anticipated to occur within the California segment of the Project. Four sensitive species of bats have the potential to occur within the Project area in the Nevada segment of the Project. Two of these, the California Myotis and the Big Free-tailed Bat, are likely to occur within the Project area only during nocturnal foraging; however, significant impacts to these species are unlikely from this Project. Removal of vegetation on the Project may impact some insect prey that could be used by these species, however, the quantity of prey that would be impacted is considered inconsequential.

The portion of the telecommunication route alternative located on the Eldorado-Lugo 500kV transmission line passes through a historic mining area at the south end of the McCullough Mountains. Old mine adits and shafts in the area may provide suitable roosting habitat for the California Leaf-nosed Bat and/or the Townsend's Big-eared Bat. Provided construction activities do not impact any of these mine features, impacts to these bat species would be less than significant.

Desert Bighorn Sheep

Desert bighorn sheep has the potential to occur within the project area. With implementation of species specific conservation measure BIO MIT-2 (bighorn sheep) and APMs BIO-1 (preconstruction surveys) and BIO-5 (biological monitors), impacts to Bighorn Sheep would be less than significant.

Desert Tortoise

Although the majority of the project is located within potential desert tortoise habitat and construction activities in desert tortoise habitat has the potential to impact desert tortoise through several means, impacts to desert tortoise would be less than significant with implementation of mitigation measure BIO MIT-1 (desert tortoise) and APMs BIO-1 (preconstruction surveys), BIO-2 (minimize vegetation impacts), BIO-5 (biological monitors), and BIO-9 (facility siting).

Gila Monster

Gila monster has the potential to occur within the project area, with the implementation of BIO MIT-4 (Gila Monster) and APMs BIO-1 (preconstruction surveys), BIO-5 (biological monitors), and BIO-9 (facility siting) impacts to Gila monster would be less than significant.

Western Burrowing Owl

Western burrowing owl has the potential to occur within the project area. With implementation of species specific conservation measure BIO MIT-3 (burrowing owl) and APMs BIO-1 (preconstruction surveys), BIO-5 (biological monitors), and BIO-7 (Avoid impacts to active nests), impacts to burrowing owl would be less than significant.

Raptors

Spacing between conductors and grounding surfaces on the 220kV structures for this Project is adequate to preclude electrocution potential for raptors. It is anticipated that some poles on the Nipton 33kV line proposed to support a portion of the fiber optic communications line will need to be replaced. With implementation of APMs BIO-1 (preconstruction surveys), BIO-7 (Avoid impacts to active nests), and BIO-8 (avian protection), impacts to raptor species would be less than significant.

- Any replacement poles will meet the Arizona Power Line Interaction Committee (APLIC) suggested practices for avian protection on power lines (APLIC 2006).

Migratory Birds

Conducting vegetation clearing and other ground disturbing activities outside of the avian nesting season (late February to early July) will minimize the potential for impacts to birds and potential violation of the MBTA. An executive order issued January 11, 2001 further defines the responsibilities of federal agencies to protect migratory birds; the MBTA, and subsequent amendments (16 USC 703-711) state that it is unlawful to take, kill, or possess migratory birds. A list of protected birds is found in 50 C.F.R. 10.13. There are no known migratory bird corridors within the Project limits. With implementation of APMs BIO-1 (preconstruction surveys), BIO-7 (avoid impacts to active nests), and BIO-8 (avian protection), impacts to migratory bird species would be less than significant.

- If construction occurs during the breeding season, the construction area will be surveyed for nests prior to initiation of construction activities. Surveys should include raptor and corvid nests on existing lattice towers.

- Active bird nests will be avoided with an appropriately sized buffer sufficient to prevent disturbance during construction activities until the nestlings fledge. Alternatively, eggs, and/or young may be relocated after consultation with USFWS and/or CDFG or NDOW.

Reptiles (Other than Desert Tortoise)

Several sensitive (mostly MSHCP covered) reptile species may occur in the Project area. Reptiles are highly susceptible to impacts from vehicles and construction equipment activities. Vegetation and ground disturbances may crush individuals on the surface, among vegetation, in burrows, or those sequestered beneath surface debris and rocks. No practical method is available to mitigate for many of these smaller animals; however, biological monitors will be appropriately permitted to handle and move reptiles that are considered to be in jeopardy from Project construction activities. With implementation of APMs BIO-1 (preconstruction surveys), BIO-2 (minimize vegetation impacts), and BIO-5 (biological monitors) impacts to sensitive reptile species would be less than significant.

Sensitive Plants

In addition to the focused rare plant surveys, preconstruction surveys for sensitive plant species would occur prior to construction after final engineering plans are available. With implementation of APMs BIO-1 (preconstruction surveys), BIO-2 (minimize vegetation impacts), and BIO-9 (facility siting) impacts to rare plant species would be less than significant.

- Sensitive plant species documented during rare plant surveys, pre-construction surveys, or located during construction will be avoided where possible, or transplanted if permissible and feasible.

- Sensitive plants that cannot be avoided, and which either may not be transplanted, or that are known to not transplant successfully may have their seed harvested prior to construction and broadcast at their source after completion of construction. Since local annual rainfall in the Project area is generally inadequate to support re-seeding efforts, re-seeding is not recommended.

- If sensitive plant species are present, SCE would either modify the Project design to avoid the resource, or would implement APMs to minimize the impact to these species from Project-related activities.

Vegetation

Vegetation clearing for access to tower sites and at tower sites will be minimized to the greatest extent feasible (APM BIO-2). This activity has the potential to remove plants that may provide forage and cover for some wildlife species. Removal of vegetation will increase the potential for post-construction erosion. Project BMPs that address erosion protection will minimize the potential for such effects (APM BIO-4). Invasive plants may compete with native vegetation for resources, and may change the local fire regime. Invasive plant species may not be palatable alternatives for sensitive species using native vegetation in the area such as the Desert Tortoise. With implementation of APMs BIO-2, BIO-4, and BIO-10 impacts to vegetation will be less than significant.

- An invasive plant management plan will be developed to reduce the potential for spreading invasive plant species during construction activities (APM BIO-10).

Vegetation

Vegetation clearing for access to tower sites and at tower sites will be minimized to the greatest extent feasible (APM BIO-2). This activity has the potential to remove plants that may provide forage and cover for some wildlife species. Removal of vegetation will increase the potential for post-construction erosion. Project BMPs that address erosion protection will minimize the potential for such effects (APM BIO-4). Invasive plants may compete with native vegetation for resources, and may change the local fire regime. Invasive plant species may not be palatable alternatives for sensitive species using native vegetation in the area such as the Desert Tortoise. With implementation of APMs BIO-2, BIO-4, and BIO-10 impacts to vegetation will be less than significant.

- An invasive plant management plan will be developed to reduce the potential for spreading invasive plant species during construction activities (APM BIO-10).

Would the Project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service?

Vegetated and unvegetated ephemeral desert washes occur throughout the Project area, however, the majority of these features are easily avoided through structure siting and spanning. There are also several larger washes with desert wash vegetation associated with the steeper slopes and mountain ranges in the Project area. Existing access roads are located within and cross some of the desert washes in the Project area, and with the exception of spur roads, no new access roads will be required. Spur roads may need to be placed through small xeric washes in some areas. With the implementation of BIO-2 (minimize vegetation impacts), BIO-3 (avoid impacts to jurisdictional wetlands), BIO-4 (BMPs), and BIO-9 (facility siting) impacts to habitat associated with desert washes will be less than significant.

Would the Project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

As part of the Proposed Project, preconstruction surveys would be conducted and would include a jurisdictional delineation to describe and map the extent of resources under the jurisdiction of the USACE, the RWQCB, and/or the CDFG following the guidelines presented in the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region*. Appropriate permits will be obtained based upon the results of the surveys, jurisdictional delineations, and agency consultation. Although ephemeral desert washes and interior dry lakes are present within the Project area, it is unlikely that any jurisdictional wetlands are present. If any wetlands are present, SCE would either modify the Project design to avoid the resource, or would implement APMs (APM BIO-3) to minimize the impact to these resources. Impacts to wetlands are expected to be less than significant.

Would the Project interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

The majority of the Proposed Project would be located within open space areas with native habitat allowing free movement of wildlife species. Due to the relatively small size of structures, the large spans between structures, and the open landscape, the Project as proposed would not interfere substantially with the movement of any wildlife species. However, the portion of the Project within the north McCullough Mountains is located within designated crucial Bighorn Sheep habitat; construction activities in this area have the potential to disturb Bighorn Sheep that may be foraging or moving through the area (see Bighorn Sheep species account in the Phase Specific Impacts/Proposed Transmission Line Route section below). With implementation of species specific conservation measure BIO MIT-2 (Bighorn Sheep) and APMs BIO-1 (preconstruction surveys) and BIO-5 (biological monitors), impacts to Bighorn Sheep would be less than significant.

Would the Project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

There are no known local policies or ordinances are located within the Project area; therefore, there would be no impact.

Would the Project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

A MSHCP has been prepared for Clark County, Nevada. No other HCPs or NCCPs are known within the Project area. The Clark County MSHCP applies to non-federal property within Clark County; however, with the exception of the portion of the proposed transmission line on City of Boulder property near the Eldorado Substation, the majority of the Proposed Project is located on BLM property. The Project would not conflict with the provisions of the Clark County MSHCP, which allows for utility uses.

Phase Specific Impacts

Proposed Transmission Line Route

The proposed Eldorado to Ivanpah 220kV transmission line route is 35.5 miles in length, 32 miles of which will replace existing structures within the existing El Dorado – Baker – Coolwater-Dunn Siding-Mountain Pass 115kV transmission line ROW. Acres of temporary and permanent ground disturbance are given in the Project Plan of Development and Section 3 of this document. Impacts to biological resources will include temporary loss of habitat associated with ground disturbing activities, and would also likely include loss of individuals of some wildlife species, particularly small mammals and herpetofauna that are less mobile, or are sequestered in vegetation or in burrows.

Wildlife

American Badger

The American badger is likely to occur within the Project limits, although they are probably not common in the area. There are no specific mitigations proposed for this species. Active badger burrows located during any pre-construction surveys or during the construction phase of the Project should be flagged off by the construction monitor when construction will occur within 100 feet of this resource. Impacts to American badger would be less than significant.

Desert Bighorn Sheep

The only suitable bighorn sheep habitat in the California segment of the Project is near the Mountain Pass Substation. Better habitat is present to the north in the main portion of the Clark Mountain Range. Due to a paucity of available escape terrain and the presence of taller vegetation in the Mountain Pass area, bighorn are unlikely to regularly use the Project area. I-15, south of the Mountain Pass Substation, is an impediment to bighorn movements to the Project area from the Mescal Range and the Ivanpah Mountains to the south. Because of this, the potential for impacts to this species for the California segment of the Project is considered less than significant.

There is greater presence of bighorn in the McCullough Range in the Nevada segment of the Project. Because the Project alignment through the north McCullough Pass will use existing access roads, no increase in human access to this area will result from this Project. Potential impacts to bighorn from construction of this Project would therefore be limited to disturbance during the construction phase of the Project, and some temporary loss of forage within the ROW.

Bighorn use the north McCullough Pass area to access the Linda water development (guzzler) approximately 1.3 miles north of the pass. This water source is essential to the survival of this population, particularly during the drier months of spring and summer (Shepard 2003). Of the four water developments in the north end of the range, the Linda guzzler is closest to the Project. Access to the Linda guzzler by bighorn from the southern portion of the range would require bighorn to cross the construction corridor.

In conjunction with the construction of a 500kV transmission line through desert ranges in southwest Arizona from 1977 to 1984, long-term studies on bighorn sheep were performed to determine effects of linear construction on bighorn sheep (Smith et al. 1986). During these studies in Arizona, numerous animals were captured and fitted with radio-collars for subsequent relocation. Results of this study indicated that the construction and operation of the original transmission line had little impact on bighorn populations in the Dome Rock Mountains, New Water Mountains, or the Livingston Hills. There were no clear indications that construction activities or operation of the line caused any of the resident bighorn to abandon or shift normal home ranges. In fact, several bighorn spent more time in the transmission line vicinity during construction than they had in the pre-construction or post-construction periods (Smith et al. 1986).

In contrast, the data regarding bighorn ram crossings of the transmission line during construction were found to be somewhat confusing. In the area between the New Water Mountains and the Kofa Mountains/Livingston Hills, it appeared that the construction interfered with normal crossings between mountain ranges. Only one ram crossed this corridor twice during construction, compared with four rams making 15 crossings before construction and eight rams making 41 crossings in the post-construction period. In the Copper Bottom Pass region in the Dome Rock Mountains, bighorn rams actually crossed the corridor more frequently during the construction period than either before or after construction. The contrast between these two areas may be related to the availability of escape terrain. In the Dome Rock Mountains, the corridor is very narrow, with rugged escape areas readily available both north and south of the transmission line. In the Kofa Mountains area, the transmission line corridor was in a wide flat area, up to 2 kilometers (1.24 miles) from escape terrain. Bighorns may be unwilling to travel that far from escape terrain while construction activities are in progress (Smith et al. 1986).

The terrain in the north McCullough Pass area consists mostly of relatively steep, but not sheer hills, except near the crest of the pass. Escape terrain is moderate to very good, and vegetation cover is sparse and low, providing good visibility for bighorn. Whether the moderate steepness and good visibility here are sufficient to allow bighorns to cross the transmission line corridor in the presence of people or construction activity is not known.

Bighorn possess an innate curiosity regarding humans and human activity, and are to a degree adaptable to low levels of disturbance. The manner in which bighorn react to human presence and disturbance is a function of their past exposure to humans and can vary greatly with each individual animal, or group of sheep (Welles and Welles 1961). Provided the element of available escape terrain is present, short-term disturbance by human activity is generally tolerated. Prolonged or permanent encroachment by man is the primary factor that has permanently removed bighorn from much of their historic range.

These observations may be used to predict that the construction, operation, and maintenance of the Proposed Project will have no long-term impacts on bighorn sheep using the McCullough Mountains. Although there could be a temporary reduction in the frequency of Bighorns crossing the ROW during construction, operation of the transmission line is not expected to have any long-term impact on the frequency of Bighorns using this area. Construction and operation of this Project are not expected to have any impact on distribution or home range use by Bighorn in the McCullough Mountains.

The Project alignment through the north McCullough Pass would pass through approximately 2.29 miles of BLM designated crucial habitat for the desert bighorn (Figure 4.4-3, located in Map Volume). Areas of winter range occur both east and west of the area of crucial habitat, but while they are within the Project area, they are mostly outside of the ROW. Minor impacts to forage would occur associated with vegetation removal for construction of tower spurs and sites. The magnitude of vegetation removal for this Project is considered inconsequential for bighorn sheep in the area. An area of approximately 450 acres in the north end of the Lucy Gray Mountains is recognized as suitable but historically unoccupied bighorn habitat.

With implementation of species specific conservation measure BIO MIT-2 (bighorn sheep) and APMs BIO-1 (preconstruction surveys) and BIO-5 (biological monitors) impacts to bighorn sheep would be less than significant.

Wild Burro

Pre-construction biological training of SCE and construction personnel shall include a discussion of sensitive biological resources, including the wild burro, and shall stress that no harassment or feeding of wild burros will be condoned. Construction trash, particularly food items shall be deposited in sealed containers present in each work area, which shall be emptied and removed from the Project and properly disposed of on a daily basis. Loss of some wild burro forage would occur due to vegetation clearing for spur roads and at the Ivanpah Substation site. Wild burros are very flexible in their food utilization and the quantity of vegetation to be removed represents an insignificant fraction of a percent of similar forage available to burros in the area. Potential impacts to wild burros from the Project are considered less than significant.

Golden Eagle

Since construction of this Project is essentially a line upgrade, and does not involve the placement of a significant quantity of new structures, there would be no significant increase in collision hazards for birds associated with the Project. In addition, there are existing non-SCE transmission lines within the Project area. Clearing of vegetation and ground disturbing impacts may affect some potential prey that could be used by golden eagles, but the magnitude of such impacts from this Project are considered inconsequential for the species. A pre-construction clearance survey for nesting birds conducted during the avian nesting season (late February to early July) would minimize potential for violation of the MBTA or the BGEPA. Impacts to golden eagle would be less than significant

Prairie Falcon

The prairie falcon is unlikely to nest within the Project limits, and impacts would be limited to minor loss of potential prey for the species that may result from vegetation removal and ground disturbing activities. Such impacts are considered inconsequential for the species, and no species specific mitigations are proposed. Impacts to prairie falcon would be less than significant.

Peregrine Falcon

The peregrine falcon could nest in the north McCullough Pass area in proximity to the proposed transmission line route. There is no other suitable nesting habitat for peregrines in proximity to the Proposed Project route, alternatives, or communications routes. A pre-construction survey for nesting peregrines in the north McCullough Pass area should be conducted prior to initiation of construction. Non-nesting related impacts would be limited to minor loss of potential prey for the species that may result from vegetation removal. Considering the limited quantity of ground disturbance associated with this Project, such impacts are considered inconsequential for the species, and no species specific mitigations are proposed. Impacts to peregrine falcon would be less than significant.

Western Burrowing Owl

Due to the proximity of sightings of the western burrowing owl to the Ivanpah Substation site (CEC 2008), the owls could occur within the Project limits. Burrowing owls could also occur in the Nevada portion of the Project in areas of suitable habitat, particularly where desert tortoise burrows are abundant. If Project ground disturbing activities will occur prior to the burrowing owl breeding season (mid March to August), all burrows, holes, crevices, or other cavities in suitable habitat on the Project, within the limits of proposed ground disturbance, shall be thoroughly inspected by a qualified biologist before collapsing. This would discourage owls from breeding on the construction site. Other species using burrows shall be relocated prior to collapsing burrows. If construction is initiated after the commencement of the breeding season and burrowing owls can be seen within areas to be affected by ground construction activities, behavioral observations shall be done by a qualified biologist to determine their breeding status. If breeding is observed, the nest area shall be avoided with an appropriately sized buffer sufficient to prevent disturbance during construction activities until the chicks fledge.

Removal of vegetation and ground disturbing activities may impact nesting habitat and prey species that could be used by the burrowing owls. The magnitude of such impacts that may result from this Project are not considered significant for this species. With implementation of species specific conservation measure BIO MIT-3 (burrowing owl) and BIO-1 (preconstruction surveys), impacts to burrowing owl would be less than significant.

Loggerhead Shrike

The loggerhead shrike occurs within the California segment, and is likely to also be present on the Nevada segment of the Project. A pre-construction avian nesting survey conducted prior to ground disturbing activities during the nesting season would minimize potential for violation of the MBTA. Removal of vegetation and ground disturbing activities may impact nesting habitat and prey species that could be used by shrikes. The magnitude of such impacts that may result from this Project are considered inconsequential for this species. Impacts to loggerhead shrike would be less than significant.

LeConte’s Thrasher

LeConte’s thrasher may occur within both the California and Nevada segments of the Project. A pre-construction nesting survey during the avian nesting season would minimize potential for violation of the MBTA. Removal of vegetation and ground disturbing activities may impact nesting habitat and prey species that could be used by these birds. The magnitude of such impacts that may result from this Project are considered inconsequential for this species. Impacts to LeConte’s thrasher would be less than significant.

Phainopepla

The Phainopepla has been observed on the Nevada segment of the Project, and may also occur within the limits of the California segment. A pre-construction nesting survey during the avian nesting season would minimize potential for violation of the MBTA. Removal of vegetation may impact nesting habitat and prey species that could be used by these birds. The magnitude of such impacts that may result from this Project are considered inconsequential for this species. Impacts to Phainopepla would be less than significant.

Desert Tortoise

Both the California and Nevada segments of the Project pass through designated Desert Tortoise Critical Habitat, and consultation with the USFWS would be required. Portions of the California segment of the Project are within the Ivanpah DWMA of the Eastern Mojave Recovery Unit (EMRU) for the desert tortoise (Figure 4.4-4, located in Map Volume). Portions of the Nevada segment of the Project are within the Piute-Eldorado, Nevada DWMA of the EMRU. The Nevada segment is contiguous with the BLM ACEC for this species as delineated in the 1997 Las Vegas District BLM RMP. The federal recovery plan states that “the Piute Valley represents the largest area of high density desert tortoise habitat known in Nevada,” with an adult tortoise density of 40 to 90 individuals per square mile (USFWS 1994).

The majority of the Project is located within suitable habitat for desert tortoise. A Project protocol level survey for the desert tortoise was performed by Alice E. Karl and Associates in May of 2008 for the existing 115kV transmission line route between the Eldorado Substation in Nevada and the Mountain Pass Substation in California. Desert tortoise sign was observed throughout the majority of the survey area with the exception of the developed and disturbed areas around Primm, Nevada, the dry lake playas, and the higher elevation areas around Mountain Pass Substation.

Potential impacts to desert tortoise could include loss of habitat due to construction of new access roads, tower spur roads, and tower sites; mortality of tortoises during construction or by construction equipment or traffic using existing ROWs or access roads; introduction or spread of invasive plant species; attraction of predators such as Coyotes and Ravens to the Project area during construction; and increased access by the public to tortoise habitat through new road construction.

The construction of new access roads, tower spur roads, and tower sites would reduce the amount of suitable habitat for desert tortoises due primarily to the removal of vegetation, which provides food, shade, and soil support for burrow construction by tortoises. Since existing access is present along most of the length of the Project, and post-construction traffic on the ROW would be intermittent, significant tortoise habitat fragmentation is unlikely as a result of this Project. Soil disturbance and removal of native vegetation can encourage the infiltration and proliferation of invasive plant species, altering the native plant community, and adversely affect the plant diversity and quantity of forage on which tortoises depend. These exotic ephemerals can potentially intensify fires occurring in the area. (National Park Service [NPS] no date). An invasive plant management plan will be developed to reduce the potential for spreading invasive plant species during construction activities. Although few ravens or coyotes (or sign) have been observed in the Project area during the biological surveys, human activitiy in the Project area during construction could increase the populations of these native predators of the desert tortoise through attraction by human-induced increases in food and water supplies. Measures will be implemented to ensure that trash will be disposed of properly and water is not available to wildlife. New access and spur roads have the potential to increase public access to desert tortoise habitat; however, the human presence throughout much of the Project area is already high due to OHV use and recreational activities, and the majority of the Project will be accessed using existing roads. Therefore, the Project is not expected to result in a significant increase in public access.

Although construction activities in desert tortoise habitat has the potential to impact desert tortoise through several means, impacts to desert tortoise would be less than significant with implementation of conservation measure BIO MIT-1 (Section 4.4.5) and APMs BIO-1 (preconstruction surveys), BIO-2 (minimize vegetation impacts), BIO-5 (biological monitors), and BIO-9 (facility siting).

The majority of the transmission nd telecommunication routes are located within desert tortoise habitat, Table 4-13 shows the approximate length of each of the route alternatives within desert tortoise habitat and designated critical habitat. These estimates are based upon the habitat types within the Project area and include all potential desert tortoise habitat regardlessof habitat quality; areasnot included within potential desert tortoise habitat includes developed areas and the dry lake beds. Although the underground portion of the telecommunication route on Highway 164/Nipton Road will be located within the existing maintained road shoulder, this area was included in the estimate due to the potential for desert tortoise to be present within the adjacent habitat.

TABLE 4-13 LENGTH OF ROUTE WITHIN DESERT TORTOISE HABITAT (MILES)			
Project Feature	**Length of Route within Designated Critical Habitat**	**Length of Route within Desert Tortoise Habitat**	**Total Length of Route**
Proposed Route	8.3	31.5	34.7
Alternative A	7.1	30.6	33.8
Alternative B	8.3	35.3	38.3
Alternative C	8.3	35.2	35.5
Alternative D	8.3	33.6	35.0
Alternative E	8.3	33.7	35.0
Telecom Path 2 Preferred	14.9	29.7	39.7
Telecom Path 2-Alternative 1	24.6	45.6	46.4
Telecom Path 2-Alternative 2	24.6	51.7	52.8

Chuckwalla

Chuckwallas have been observed in the Project area. Impacts to chuckwallas could include loss of crevice habitat if boulder piles or fractured bedrock are removed for development of tower sites. Clearing of vegetation in chuckwalla habitat could remove vegetation used as forage by the species. This potential is greatest in the north McCullough Pass area where there is abundant habitat for the species. There are only a few tower sites that may require placement in potential chuckwalla habitat. A pre-construction survey for chuckwallas in these areas, including relocation of animals to adjacent habitat would minimize potential impacts to the animals. Any chuckwallas observed to be in jeopardy during construction activities may be captured and moved by the on-site desert tortoise biological monitor. The monitor will be under permit to handle this species. Large rock removed from tower sites can be stockpiled adjacent to the tower site and may provide suitable habitat that would be colonized by chuckwallas. There is abundant chuckwalla habitat in the areas that may be affected by construction and impacts to chuckwalla habitat would be less than significant.

Gila Monster

Gila monsters have not been observed in the Project area; however, there is the potential for them to be present. In compliance with the NAC regarding protection of the Gila monster, standard NDOW protocols NRS 503.597 and NAC 503.093 will be followed if a Gila monster is encountered during construction activities. SCE will obtain all necessary authorizations for the Gila monster before the Project biological monitor can move or handle this species. Impacts to Gila monsters would be less than significant.

<u>Plants</u>

No mitigations are proposed for any sensitive plant species that were initially identified as potentially occurring within the Project area, but that were not confirmed present by the rare plant survey conducted in May of 2008. Likewise, no mitigations are proposed for the two CNPS List 4 species recorded during the survey - the black grama and the Utah vine milkweed. Any subsequent observations of rare plant species on the Project shall be addressed when such instances occur. New observations of rare plant occurrences within the Project limits shall utilize mitigations described below. With implementation of APMs BIO-1 (preconstruction surveys), BIO-2 (minimize vegetation impacts), and BIO-9 (facility siting) impacts to the following rare plant species would be less than significant. Re-seeding of native plants in areas where annual precipitation is less than 11 inches is generally considered ineffective. Annual precipitation in the Project area is less than nine inches (Hereford and Longpré no date), and re-seeding for this Project is not recommended. Where avoidance of sensitive plants is not possible, transplanting of some species is feasible, and is discussed below where appropriate. Transplanting of sensitive species should be accomplished with permission of the appropriate agency and with required permits.

Mojave Milkweed

The rare plant survey conducted for this Project located a single individual of this species in the California segment of the Project. A pre-construction survey for this species should be conducted within an approximately 100-foot radius of the known location. Mojave milkweed plants may be flagged off by the biological monitor using a 30-foot buffer. If plants of this species fall within the ground disturbing limits of a new access or tower spur road the number of plants lost to construction shall be documented. Transplanting of individuals of this species should be successful if they are moved between November and March.

Desert Pincushion/Viviparous Foxtail Cactus

This species was observed at nine separate locations within the California segment of the Project, some representing more than one plant. A pre-construction survey for this species should be conducted within an approximately 100-foot radius of the known locations. These cacti may be avoided or flagged off by the biological monitor using a 30-foot buffer. If individuals of this species cannot be avoided, they should be transplanted to suitable habitat outside of areas that will be disturbed. Transplanting of individuals of this species is suggested if avoidance cannot be accomplished. Transplanting should occur between November and March.

Nine-awned Pappus Grass

Nine-awned Pappus Grass was found on the Project as a single occurrence within the California segment of the Project. A pre-construction survey for this species should be conducted within an approximately 100-foot radius of the known locations. These plants may be avoided or flagged off by the biological monitor using a 30-foot buffer. If plants of this species fall within the ground disturbing limits of a new access or tower spur road the number of plants lost to construction shall be documented. Transplanting of individuals of this species should be successful if they are moved between November and March.

California Barrel Cactus

The California barrel cactus is a California BLM sensitive species. The species is present in the Project area in moderate numbers. These cacti can be avoided or transplanted to suitable habitat outside of areas that will be disturbed. Transplanting of individuals of this species should be successful if they are moved between November and March.

Parish Club Cholla

The Parish club cholla was observed as four occurrences. This species typically grows in large clusters. A pre-construction survey for this species should be conducted within an approximately 100-foot radius of the known locations. These cacti may be avoided or flagged off by the biological monitor using a 30-foot buffer. If individuals of this species cannot be avoided, they should be transplanted to suitable habitat outside of areas that will be disturbed. Transplanting of individuals of this species should be successful if they are moved between November and March.

Rosy Twotone Beardtongue

Eighteen occurrences of the rosy twotone beardtongue were observed during the rare plant survey. Most occurrences represented only one or two plants. The largest grouping included 11 plants. A pre-construction survey for this species should be conducted within an approximately 100-foot radius of the known locations. These plants may be avoided or flagged off by the biological monitor using a 30-foot buffer. This species is a persistent perennial plant, and transplanting of individuals is feasible. Transplanting of individuals of this species should be successful if they are moved between November and March.

White-margined Beardtongue

Several individuals of the white-margined beardtongue were located on the Nevada segment of the Project ROW in an area approximately 1.75 miles in length along the east side of Roach Lake. A pre-construction survey for this species should be conducted within this area. The survey should include the entire area defined by Smith (2001) as site 12. These plants may be avoided or flagged off by the biological monitor using a 30-foot buffer. This species is categorized as a perennial, but may not be as persistent as the rosy twotone beardtongue, and the potential for successfully transplanting this species is not known. Transplanting of this species may be attempted. Transplanting efforts for this species should be attempted between November and March.

Aven Nelson’s Phacelia

Five populations of Aven Nelson’s phacelia were observed during the rare plant survey, including the single largest population of the species in California (GLC 2008). All populations were within the California segment of the Project. A pre-construction survey for this species should be conducted within an approximately 100-foot radius of the known locations. These plants may be avoided or flagged off by the biological monitor using a 30-foot buffer. Transplanting this species would probably not be effective. If plants of this species fall within the ground disturbing limits of a new access or tower spur road the number of plants lost to construction shall be documented.

Sky Blue Phacelia

A single occurrence of the sky blue phacelia was located during the rare plant survey on the California segment of the Project. A pre-construction survey for this species should be conducted within an approximately 100-foot radius of the known locations. These plants may be avoided or flagged off by the biological monitor using a 30-foot buffer. Transplanting this species would probably not be effective. If plants of this species fall within the ground disturbing limits of a new access or tower spur road the number of plants lost to construction shall be documented.

<u>Alternative Transmission Line Routes</u>

Alternative A

All but approximately the eastern 0.7 mile of Alternative A is within designated Critical Habitat for the desert tortoise (Figure 4.4-4, located in Map Volume). Alternative A does not represent a reduction of the traversed distance within Desert Tortoise Critical Habitat over the proposed route. Desert tortoise sign was found within the proposed route just north of Alternative A. No survey has been conducted along this alternative for desert tortoises. However, surveys are planned for Spring 2009; Suitable habitat for the western burrowing owl, Phainopepla, and loggerhead shrike may be present within the limits of this alternative.

The rare plant survey conducted along the proposed route just north, and roughly parallel with Alternative A, documented no rare plants. No rare plant survey has been conducted for Alternative A. Due to a lack of suitable habitat no other sensitive wildlife or plant species are anticipated to occur within the limits of this alternative. Mitigations for this alternative would be the same as those listed for the proposed route, as applicable.

Alternative B

Alternative B is not within any designated Critical Habitat for the desert tortoise, but suitable habitat for desert tortoises is present throughout the alternative (Figure 4.4-4, located in Map Volume). No survey has been conducted along this alternative for desert tortoises. However, surveys are planned for Spring 2009, suitable habitat for the western burrowing owl, Phainopepla, and loggerhead shrike may be present within the limits of this alternative.

No rare plant survey has been conducted for this alternative, but approximately 8.0 miles of plant survey from the existing Eldorado Substation to the west along the proposed route found no rare plants. Due to a lack of suitable habitat, no other sensitive wildlife or plant species are anticipated to occur within the limits of this alternative. Mitigations for this alternative would be the same as those listed for the proposed route, as applicable.

Alternative C

Alternative C goes north around Primm, Nevada and reconnects with the proposed route on the northwest flank of Ivanpah Lake. Alternative C crosses through small limestone foothills just northwest of Primm, and suitable desert tortoise habitat is present within this area. The southern leg of this alternative along the western flank of Ivanpah Lake is less suitable for desert tortoises. No survey has been conducted along this alternative for desert tortoises. However, surveys are planned for Spring 2009, Scat of wild burro was observed on this alternative during a site reconnaissance in August of 2008. Other sensitive wildlife species with potential to occur within the limits of this alternative include the American badger, western burrowing owl, chuckwalla, Gila monster, golden eagle, loggerhead shrike, and LeConte's thrasher.

No rare plant survey has been conducted for this alternative. Sensitive plant species that could potentially occur along Alternative C include white bearpoppy, Mojave milkweed, black grama, Gilman's cymopterus, Utah vine milkweed, desert pincushion (or viviparous foxtail cactus), nine-awned pappus grass, California barrel cactus, Parish club cholla, tough muhly, curve-spined beavertail, rosy two-toned beardtongue, Stephen's penstemon, Aven Nelson's phacelia, and sky-blue phacelia. Due to a lack of suitable habitat, no other sensitive wildlife or plant species are anticipated to occur within the limits of this alternative. Mitigations for this alternative would be the same as those listed for the proposed route, as applicable.

Alternatives D and E

Because Alternative E is a very small section situated essentially within Alternative D, the two alternatives have been combined for this discussion. Tortoise sign is sparse near these alternatives. The sign increases along the proposed route to the northeast. Most of Alternative D and all of Alternative E were covered by the outer limits of the Project 2008 protocol tortoise survey that was centered on the proposed route just to the northwest of these alternatives. Other wildlife species that could potentially occur within these alternatives includes American badger, wild burro, western burrowing owl, and golden eagle.

The nearest sensitive plant records to these alternatives are for white-margined penstemon, approximately 3.3 miles to the northeast, and Parish club cholla approximately 4.8 miles to the southwest. There is no suitable habitat for the white-margined penstemon within either of these alternatives. Parish club cholla could possibly occur within the alternatives, but the habitat is marginal. Due to a lack of suitable habitat, no other sensitive wildlife or plant species are anticipated to occur within the limits of this alternative. Mitigations for these alternatives would be the same as those listed for the proposed route, as applicable.

Substations

Eldorado Substation

Modifications to the existing Eldorado Substation to receive the new incoming 220kV lines would occur within previously disturbed portions of the existing substation footprint and will have no impacts to biological resources.

Ivanpah Substation

Development of the new Ivanpah Substation will remove approximately 35.2 acres of undisturbed desert habitat. Additionally, a 24-foot-wide access road would be constructed to access the substation site from the existing transmission line access road. The Project Desert Tortoise survey recorded sign of tortoises along the proposed route adjacent to the Ivanpah Substation site. Other sensitive wildlife species that could use the substation site include American badger, wild burro, golden eagle, LeConte's thrasher, and Gila monster.

Two occurrences of the Parish club cholla were recorded just southwest of the substation site, and it is possible this species is present within the proposed area of disturbance. The single Project record of the Mojave milkweed is approximately 0.75 mile southwest of the substation site. The plant could also potentially be present within the proposed area of disturbance. A Project record of nine-awned pappus grass was recorded approximately 0.8 mile southwest of the substation site. No other rare plant occurrences were recorded within 2 miles of the substation site. Due to a lack of suitable habitat, no other sensitive wildlife or plant species are anticipated to occur on the substation site. Mitigations for the Ivanpah Substation site would be the same as those listed for the proposed route, as applicable.

Telecommunication Routes

Installation of the fiber optic telecommunication lines would primarily use existing transmission or distribution line support structures or would be undergrounded within previously disturbed road shoulders, reducing impacts to undisturbed habitats. Several of the telecommunication route alternatives would require the installation of new pole lines or undergrounding of the fiber optic cable. Existing access is present for the majority of the links discussed below. Access roads may require minor rehabilitation, typically at wash crossings, to provide adequate access for equipment.

Eldorado-Lugo 500kV: Eldorado Substation to Highway 164

This segment of the telecommunication route would use existing 500kV lattice structures throughout its length; the existing ground wire on the transmission line would be replaced with an OPGW. Some towers would require supplemental support modifications to support the additional weight and wind loading of the optical ground wire. All construction work for the tower modifications and OPGW installation would be performed within the existing access road and ROW. Almost the entire 30-mile length of this link is within suitable habitat for the desert tortoise. Only the higher elevations in black bush habitat are probably not favorable for tortoises. Approximately 2.0 miles south of the Eldorado Substation the Eldorado-Lugo line enters the Piute-Eldorado, Nevada unit of designated Critical Habitat for the Mojave population desert tortoise. The line is within this unit continuously for approximately 9.0 miles to the south.

Potential impacts to desert tortoises, eggs, or juveniles could occur from construction activities during tower modifications and OPGW installation. Vegetation disturbance for installation of the OPGW would be concentrated at pulling and tensioning sites, and would be kept to the minimum required for safe positioning and operation of equipment. Tortoise mitigation measures listed under the proposed transmission route discussion apply to all telecommunication components.

Desert bighorn sheep are present in both the South McCullough Mountains and the Highland Range west and east of this link respectively. Occasional movement of bighorns across the intervening valley through which the Eldorado-Lugo line passes is likely. Placement of the OPGW line for this link would have no long-term or permanent impacts for bighorns. The portion of the link within Bighorn habitat is extensive enough to allow the passage of animals to avoid construction activities. Animals may be temporarily disturbed by construction noise and the presence of humans on foot in the area.

The portion of this link that passes between the south end of the McCullough Mountains and the north end of the New York Mountains contains numerous abandoned mine adits and shafts, some of which may support suitable habitat for roosting bat species, particularly the California leaf-nosed bat and/or the Townsend's big-eared bat. So long as construction does not affect any abandoned mines there would be no impacts to roosting bats. The magnitude of vegetation impacts that could affect invertebrate prey potentially used by bats is considered inconsequential.

Other sensitive wildlife species likely to occur along this link include western burrowing owl, peregrine falcon, prairie falcon, Phainopepla, loggerhead shrike, and Gila monster. A rare plant survey has not been conducted for this link. A single rosy two-tone beardtongue was observed along the access road for this link. Due to a lack of suitable habitat, no other sensitive wildlife or plant species are anticipated to occur on this segment. Mitigations for species present on this link would follow the guidelines provided under the proposed route section of this document.

Eldorado-Lugo 500kV to Nipton 33kV Segment – New Telecom Route along Highway 164

The Nipton 33kV to Eldorado-Lugo segment of the telecommunication route requires the placement of new underground fiber optic cable along the north side of Highway 164/Nipton Road within or adjacent to the existing road shoulder. This portion of the telecommunication route is located between the point where the Eldorado-Lugo transmission line crosses Highway 164 and the Nipton 33kV distribution line in Nipton, California. This segment is located entirely within suitable desert tortoise habitat and approximately 2.5 miles is within designated Critical Habitat for the species. Potential impacts for the desert tortoise are the same as those for the Eldorado Substation to Highway 164 link.

Other sensitive wildlife species likely to occur along this link include American badger, golden eagle, prairie falcon, western burrowing owl, phainopepla, loggerhead shrike, LeConte's thrasher, and Gila monster. A rare plant survey has not been conducted for this link. Sensitive plant species that could potentially occur within this segment include the rosy two-tone beardtongue and Aven Nelson's phacelia. Due to a lack of suitable habitat, no other sensitive wildlife or plant species are anticipated to occur on this segment. Mitigations for species present on this link would follow the guidelines provided under the proposed route section of this document.

Microwave Tower at Nipton

This telecommunication alternative would require the construction of a new microwave transmission tower approximately 0.6 mile north of Nipton. The fiber optic cable and electrical power would be extended from the Nipton 33kV line in Nipton to the proposed microwave tower site. The microwave tower would be used to transmit the telecommunication data from Eldorado

Substation with a corresponding microwave transmitter located within the proposed Ivanpah Substation. This segment is located entirely within suitable desert tortoise habitat and is within designated Critical Habitat for the species. Potential impacts for the Desert Tortoise are the same as those for the Eldorado Substation to Highway 164 segment.

Other sensitive wildlife species likely to occur along this link include American badger, golden eagle, prairie falcon, western burrowing owl, Phainopepla, loggerhead shrike, LeConte's thrasher, and Gila monster. A rare plant survey has not been conducted for this link. Sensitive plant species that could potentially occur within this segment include the rosy two-tone beardtongue and Aven Nelson's phacelia. Due to a lack of suitable habitat, no other sensitive wildlife or plant species are anticipated to occur on this segment. Mitigations for species present on this link would follow the guidelines provided under the proposed route section of this document.

Nipton 33kV and New Underground: I-15 to Nipton

This telecommunication route segment uses the existing Nipton 33kV wood pole distribution line and new underground fiber optic on the north side of Nipton Road. With the exception of several miles of this segment that cross the south end of the dry Ivanpah Lake bed, the entire link is within suitable habitat for the desert tortoise. The entire segment is within the Ivanpah unit of designated Critical Habitat for desert tortoise.

Other sensitive wildlife species likely to occur within this link include American badger, western burrowing owl, golden eagle, LeConte's thrasher, and Gila monster. A rare plant survey has not been conducted for this link. Sensitive plant species that could potentially occur along this segment include Mojave milkweed, black grama, Utah vine milkweed, nine-awned pappus grass, California barrel cactus, Parish club cholla, Plains flax, curved-spine beavertail, rosy two-toned beardtongue, Stephen's penstemon, Aven Nelson's phacelia, and sky-blue phacelia. Due to a lack of suitable habitat, no other sensitive wildlife or plant species are anticipated to occur on this segment. Mitigations for species present on this link would follow the guidelines provided under the proposed route section of this document.

Nipton 33kV: Mountain Pass Substation to I-15

This link would use the existing Nipton 33kV structures and new underground fiber optic cable. Most of this link, except habitat dominated by black bush in the vicinity of the Mountain Pass Substation, is within suitable habitat for the desert tortoise. Potential impacts for the desert tortoise are the same as those for the Eldorado Substation to Highway 164 link.

Due to steep terrain along portions of this route segment, bighorn sheep may be present. Most of the segment closely parallels I-15 and construction impacts such as noise and the presence of humans is unlikely to significantly increase the impacts present due to the Interstate Highway. A rebuild of this portion of I-15 is currently under construction.

Other sensitive wildlife species that are likely to occur within this segment include American badger, wild burro, golden eagle, Virginia's warbler (*Vermivora virginiae*), and Gila monster. A rare plant survey has not been conducted for this link. Sensitive plant species that could potentially occur within this segment include Mormon needle grass, Mojave milkweed, scaly cloak fern, black grama, Gilman's cymopterus, Utah vine milkweed, desert pincushion or viviparous foxtail cactus, nine-awned pappus grass, California barrel cactus, Parish club cholla, hillside wheat grass, Plains flax, rough menodora, polished blazing star, tough muhly, curve-spined beavertail, rosy two-toned beardtongue, Stephens' penstemon, Aven Nelsons' phacelia, sky-blue phacelia, and Rusby's desert mallow. Due to a lack of suitable habitat, no other sensitive wildlife or plant species are anticipated to occur on this segment. Mitigations for species present on this link will follow the guidelines provided under the proposed route section of this document.

Nipton 33kV: Ivanpah Substation to Mountain Pass Substation

This link will use existing structures throughout its length. With the exception of its western end in the vicinity of the Mountain Pass Substation, this entire link is within suitable desert tortoise habitat. Sign of desert tortoise was documented along this link. Potential impacts for the desert tortoise are the same as those for the Eldorado Substation to Highway 164 link.

Bighorn sheep may pass through the western end of this link in the vicinity of the Mountain Pass Substation. However, they will not regularly be present in the area due to a lack of available escape terrain and the presence of some larger stature vegetation, including Utah juniper and singleleaf piñon.

Other sensitive wildlife species likely to occur within this link include American badger, wild burro, western burrowing owl, golden eagle, Le Conte's thrasher, Virginia's warbler, and Gila monster. Sensitive plant species identified along this link include Parish club cholla, Utah vine milkweed, Mojave milkweed, *Escobaria* sp. cactus, nine-awned pappus grass, sky-blue phacelia, Aven Nelson's phacelia, and black grama. Other sensitive plant species that could occur within this segment include Mormon needle grass, scaly cloak fern, Gilman's cymopterus, California barrel cactus, hillside wheat grass, Plains flax, rough menodora, polished blazing star, tough muhly, curve-spine beavertail, rosy two-toned beardtongue, and Stephens' penstemon. Due to a lack of suitable habitat, no other sensitive wildlife or plant species are anticipated to occur on this segment. Mitigations for species present on this link will follow the guidelines provided under the proposed route section of this document.

Nipton 33kV: I-15 to Golf Course

This link would mostly use the existing Nipton 33kV line for overhead installation of the fiber optic cable. Approximately 1.25 miles of new overhead pole line or underground fiber optic cable would be required on the south side of the golf course. This new section would be located along the existing roads and would connect the terminal end of the Nipton 33kV line on the southeast corner of the golf course with the terminal end of the Nipton 33kV line on the west side of the golf course. The entire length of this link is within habitat suitable for the desert tortoise. Potential impacts for the desert tortoise are the same as those for the Eldorado Substation to Highway 164 link.

Other sensitive wildlife species likely to occur within this link include American badger, wild burro, western burrowing owl, golden eagle, and Le Conte's thrasher. A rare plant survey has not been conducted for this link. Due to a lack of suitable habitat, no other sensitive wildlife or plant species are anticipated to occur on this segment. Mitigations for species present on this link would follow the guidelines provided under the proposed route section of this document.

Operation and Maintenance Impacts

Following the completion of Project construction, operation and maintenance of the new lines would commence. Inspection and maintenance activities would include the following:

- routine line patrols by both aircraft and truck
- routine, patrol-identified tower and wire maintenance
- routine line washing
- routine, patrol identified earth and sand abatement from footings
- routine ROW road maintenance

The frequency of inspection and maintenance would depend on various conditions, including length of the line and weather effects. The entire Eldorado-Ivanpah transmission line corridor would be patrolled every year. The yearly patrol alternates each year between helicopter and truck. In 1 year, the patrol would be by helicopter and would take approximately 1 day (8 hours) to accomplish. The next year, the patrol would be performed by truck and would take 5 days.

Starting approximately 15 years after the operational date, maintenance on the proposed line would be expected to increase. Initial additional corridor maintenance would be due principally to weather and vandalism to the new line. As insulators and steel age on the line, the frequency of lattice steel tower hardware maintenance activities such as bolt torquing would increase. However, no significant increase in patrols or grading would be required.

Impacts to biological resources associated with regular operation and maintenance activities on this Project are variable depending on the type of activity, equipment required, and length of human presence in the area. Helicopter flights along the line would be accomplished in a single day, and disturbance in any one section of the line is brief. Bighorn sheep and sensitive bird species could be disturbed by noise generated by helicopters. Impacts of such brief duration are generally not considered significant for bighorn sheep using the area. Helicopter patrols should be conducted outside of bighorn lambing season (April through October). Truck patrols and maintenance and repair activities in north McCullough Pass could temporarily disturb Bighorns active in the area. Operational guidelines would be developed in consultation with the BLM and wildlife agencies to reduce impacts to bighorn sheep to less than significant

Truck patrols and maintenance and repair vehicles could cause mortality of adult or juvenile desert tortoises that wander on to the access or tower spur roads. Tortoise awareness training is required by SCE for all employees working in desert tortoise habitat. A maximum speed limit of 20 miles per hour is imposed on all vehicles operating in desert tortoise habitat. The limited vegetation removal associated with maintaining drainage crossings on the access and spur roads is inconsequential for sensitive wildlife in the area. Vegetation management activities should be scheduled outside the general bird nesting season (late February to early July) and personnel removing vegetation should be cognizant of the potential for the presence of nesting birds during the nesting season. Active nests observed should be avoided. Routine patrols and maintenance should not have a significant effect on sensitive plant species provided work is confined to previously disturbed areas. Existing SCE operational guidelines as described in the SCE Memorandum of Understanding (MOU) with BLM California Desert District will be implemented to reduce impacts to Desert Tortoise to less than significant.

4.4.5 Species Specific Mitigation Measures

In addition to the APMs, specific measures would be incorporated to mitigate potential impacts to desert tortoise, bighorn sheep, western burrowing owl, and Gila monster. Desert tortoise and bighorn sheep are known to occur in the Project area and have been observed during the biological surveys and other Project site visits. Western burrowing owls have been recently observed in proximity to the Ivanpah Substation site during biological surveys conducted for the adjacent ISEGS (CEC 2008).

BIO MIT-1 Desert Tortoise

- A field contact representative will be designated and shall oversee compliance monitoring activities and coordination with authorizing agency(s). Compliance activities shall at a minimum include conducting pre-construction surveys, assuring proper removal of desert tortoise, staffing of biological monitors on construction spreads, and upholding all conditions authorized. The field contact representative shall also oversee all compliance documentation including daily observation reports, non-compliance and corrective action reports, and final reporting to any authorized agency upon Project completion.
- All work area boundaries associated with temporary and permanent disturbances will be conspicuously staked, flagged, or marked to minimize surface disturbance activities. All workers shall strictly limit activities and vehicles to the designated work areas.
- Crushing/removal of perennial vegetation in work areas will be avoided to the maximum extent practicable.
- All trash and food items generated by construction and maintenance activities shall be promptly contained and regularly removed from the Project site(s) to reduce the attractiveness of the area to common ravens.
- Pets shall not be allowed in working areas unless restrained in a kennel.
- Where possible, motor vehicles shall be limited to maintained roads and designated routes.
- Vehicle speed within the Project area, along ROW maintenance routes, and existing access roads shall not exceed 20 miles per hour. Speed limits shall be clearly marked and all workers shall be made aware of these limits.
- Constructed road berms will be less than 12 inches in height and have slopes less than 30 degrees.

- Construction monitoring will employ a designated field contact representative, authorized biologist(s), and qualified biologist(s) approved by the BLM during the construction phase. At a minimum, qualified biologist(s) shall be present during all activities in which encounters with tortoises may occur. A qualified biologist is defined as a person with appropriate education, training, and experience to conduct tortoise surveys, monitor Project activities, provide worker education programs, and supervise or perform other implementing actions. An authorized biologist is defined as a wildlife biologist who has been authorized to handle desert tortoises by the Service or CDFG. A field contact representative is defined as a person designated by the Project proponent who is responsible for overseeing compliance with desert tortoise protective measures and for coordination with agency compliance officer(s).

- Pre-construction clearance surveys will be conducted within 48 hours of initiation of site-specific Project activities, following Service protocol (Service 1992). The goal of a clearance survey is to find all tortoises on the surface and in burrows that could be harmed by construction activities. Surveys will cover 100 percent of the acreage to be disturbed. All potential tortoise burrows within 100 feet of construction activity will be marked. Tortoise burrows will be avoided to the extent practicable, but will be excavated if they would be crushed by construction activities.

- Any tortoise found on the surface will be relocated to less than 1,000 feet away. Tortoises will be handled carefully following the *Guidelines for Handling Desert Tortoise during Construction Projects* (Desert Tortoise Council 1999). Tortoises will be handled with new latex gloves each time to avoid transmission of disease. Note especially guidelines for precautions to be taken during hot temperatures.

- If a potential tortoise burrow must be excavated, the biologist will proceed according to the *Guidelines for Handling Desert Tortoise during Construction Projects* (Desert Tortoise Council 1999). Tortoise removed from burrows will be relocated to an artificial burrow (Desert Tortoise Council 1999). The entrance of the artificial burrow will be blocked until construction activities in the area are over (Desert Tortoise Council 1999).

- For activities conducted between March 15 and November 1 in desert tortoise habitat, all activities in which encounters with tortoises may occur will be monitored by a qualified or authorized biologist. The qualified or authorized biologist will be informed of tortoises relocated during pre-construction surveys so that they can watch for the relocated tortoises in the event that they attempt to return to the construction site. The qualified or authorized biologist will watch for tortoises wandering into the construction areas, check under vehicles, examine excavations and other potential pitfalls for entrapped animals, examine exclusion fencing, and conduct other activities to ensure that death or injuries of tortoises is minimized.

- No overnight hazards to Desert Tortoises (e.g., auger holes, trenches, pits, or other steep-sided depressions) shall be left unfenced or uncovered; such hazards shall be eliminated each day prior to the work crew and biologist leaving the site. Large or long-term Project areas shall be enclosed with tortoise-proof fencing. Fencing shall be removed when restoration of the site is completed.

- Any incident occurring during Project activities which is considered by the biological monitor to be in non-compliance with the mitigation plan shall be documented immediately by the biological monitor. The field contact representative shall ensure that appropriate corrective action is taken. Corrective actions shall be documented by the monitor. The following incidents shall require immediate cessation of the construction activities causing the incident, including (1) imminent threat of injury or death to a desert tortoise; (2) unauthorized handling of a desert tortoise, regardless of intent; (3) operation of construction equipment or vehicles outside a Project area cleared of desert tortoise, except on designated roads, and (4) conducting any construction activity without a biological monitor where one is required. If the monitor and field contact representative do not agree, the federal agency's compliance officer shall be contacted for resolution. All parties may refer the resolution to the federal agency's authorized officer.

- All construction personnel, including subcontractors will undergo a WEAP. This instruction shall include specific desert tortoise training on distribution, general behavior and ecology, identification, protection measures, reporting requirements, and protections afforded by state and federal endangered species acts.

- Parked vehicles shall be inspected prior to being moved. If a tortoise is found beneath a vehicle, the authorized biologist shall be contacted to move the animal from harms way, or the vehicle shall not be moved until the desert tortoise leaves on its own accord. The authorized biologist shall be responsible for taking appropriate measures to ensure that any desert tortoise moved in this manner is not exposed to temperature extremes which could be harmful to the animal.

- Should any desert tortoise be injured or killed, all activities shall be halted, and the field contact representative and/or authorized biologist immediately contacted. The field contact representative and/or authorized biologist shall be responsible for reporting the incident to the authorizing agencies.

- A report to the Service will be produced reporting all tortoises seen, injured, killed, excavated, and handled. GPS locations of live tortoises will be reported.

- SCE will implement a Raven Management Program that consists of: (1) an annual survey to identify any tortoise remains at the base of the towers; this information will be relayed to the BLM so that the ravens and/or their nests in these towers can be targeted for removal, (2) SCE making make an annual or one time contribution to an overall raven reduction program in the California or Nevada desert, with an emphasis on raven removal in the vicinity of this Project.

Impacts to Desert Tortoise would be less than significant with implementation of conservation measure BIO MIT-1 and APMs BIO-1 (preconstruction surveys), BIO-2 (minimize vegetation impacts), BIO-5 (biological monitors), and BIO-9 (facility siting).

BIO MIT-2 Desert Bighorn Sheep

SCE will consult with BLM, USFWS, and NDOW regarding conservation measures to avoid impacts to desert bighorn sheep during construction. Project areas with the potential to impact

Bighorn includes the proposed transmission line route through the McCullough Mountains and the telecommunication route segment in the southern portion of the Eldorado Valley between the Highland Range and the Southern McCullough Mountains. Mitigation measures may include such elements as preconstruction surveys, biological monitoring, and timing construction activities to avoid bighorn active seasons. Construction requiring the use of helicopters should be conducted outside of bighorn lambing season (April through October) and the dry summer months when bighorn may need to access artificial water sources north of the propose route in the McCullough Mountains (June through September).

With implementation of species specific conservation measure BIO MIT-2 (bighorn sheep) and APMs BIO-1 (preconstruction surveys) and BIO-5 (biological monitors), impacts to Bighorn Sheep would be less than significant.

BIO MIT-3 Western Burrowing Owl

The western burrowing owl is likely to occur within the California segment of the Project. Where Project ground disturbing activities will occur prior to the burrowing owl breeding season (mid March to August), all burrows, holes, crevices, or other cavities in suitable habitat on the Project, within the limits of proposed ground disturbance, will be thoroughly inspected by a qualified biologist before collapsing. This will discourage owls from breeding on the construction site. Other species using burrows will be relocated prior to collapsing burrows. If construction is initiated after the commencement of the breeding season and burrowing owls can be seen within areas to be affected by ground construction activities, behavioral observations will be done by a qualified biologist to determine their breeding status. If breeding is observed, the nest area will be avoided with an appropriately sized buffer sufficient to prevent disturbance during construction activities until the chicks fledge.

With implementation of species specific conservation measure BIO MIT-3 (burrowing owl) and BIO-1 (preconstruction surveys), impacts to burrowing owl would be less than significant.

BIO MIT-4 Gila Monster

The following mitigation measures are the current Nevada Division of Wildlife (NDOW) construction site protocols for the Gila monster (NDOW 2005). These protocols are applicable for the Gila monster in both the Nevada and California sections of the Project.

Through the WEAP, workers and other Project personnel should (at a minimum) know how to: (1) identify Gila monsters and be able to distinguish it from other lizards such as chuckwallas and banded geckos; (2) report any observations of Gila monsters (in Nevada) to biological monitor for notification of the NDOW; (3) be alerted to the consequences of a bite resulting from carelessness or unnecessary harassment; and (4) be aware of protective measures provided under state law.

- Live Gila monsters found in harms way on the construction site will be captured and then detained in a cool, shaded environment (<85 degrees Fahrenheit) by the Project biologist or equivalent personnel until a NDOW biologist can arrive for documentation purposes. Despite the fact that a Gila monster is venomous and can deliver a serious bite, its relatively slow gait allows for it to be easily coaxed or lifted into an open bucket or box, carefully using a long handled instrument such as a shovel or snake hook (Note: it is not the intent of NDOW to request unreasonable action to facilitate captures; additional coordination with NDOW will clarify logistical points). A clean 5-gallon plastic bucket with a secure, vented lid; an 18-inch x 18-inch x 4-inch plastic sweater box with a secure, vented lid; or, a tape-sealed cardboard box of similar dimension may be used for safe containment. Additionally, written information identifying the mapped capture location (e.g., GPS record), date, time, and circumstances (e.g., biological survey or construction) and habitat description (vegetation, slope, aspect, and substrate) will also be provided to NDOW.

- Injuries to Gila monsters may occur during excavation, blasting, road grading, or other construction activities. In the event a Gila monster is injured, it should be transferred to a veterinarian proficient in reptile medicine for evaluation of appropriate treatment. Rehabilitation or euthanasia expenses will not be covered by NDOW. However, NDOW will be immediately notified during normal business hours. If an animal is killed or found dead, the carcass will be immediately frozen and transferred to NDOW with a complete written description of the discovery and circumstances, habitat, and mapped location.

- Should NDOW's assistance be delayed, biological or equivalent acting personnel on-site may be requested to remove and release the Gila monster out of harm's way. Should NDOW not be immediately available to respond for photo-documentation, a 35-mm camera or equivalent (5 mega-pixel digital minimum preferred) will be used to take good quality images of the Gila monster in situ at the location of live encounter or dead salvage. The pictures, preferably on slide film (.tif or .jpg digital format) will be provided to NDOW. Pictures will include the following information: (1) Encounter location (landscape with Gila monster in clear view); (2) a clear overhead shot of the entire body with a ruler next to it for scale (Gila monster should fill camera's field of view and be in sharp focus); (3) a clear, overhead close-up of the head (head should fill camera's field of view and be in sharp focus).

The Nevada NDOW contact for the Gila Monster is Biologist Polly Conrad [(702) 486-5127 extension 3718 or e-mail - pconrad@ndow.org.].

4.4.6 Evaluation and Comparison of Proposed and Alternative Routes

Proposed Route

The proposed route will use existing access roads and the existing 115kV transmission line ROW for most of its length. Although new tower locations and spur roads will be required, the majority of the new tower locations are near the existing access roads. Use of previously disturbed access minimizes potential impacts to wildlife and vegetation. Because the route will need to cross several other existing transmission lines, and the height restrictions to do so will require larger structures and a different crossing approach, some lattice structures at transmission line crossings will of necessity need to be outside of the existing ROW.

Alternative A

Alternative A would potentially disturb approximately 5.0 miles of previously undisturbed desert habitat west of the existing Eldorado Substation, which otherwise would not be affected by use of the proposed route. However, there are existing access roads that parallel this alternative on the east side going north out of Eldorado Substation, and on the south side for the section going east-west that can be used as the main access, which would limit disturbances to development of spur roads and at tower sites. There is sign of desert tortoise in the area and creation of a new ROW could potentially impact live tortoises, and would impact some tortoise habitat. Other wildlife, rare plant species, and desert vegetation could be impacted by ground disturbing activities in development of the new section of ROW, although these impacts are likely to be low based on the paucity of desert tortoise sign and lack of rare plant observations in the vicinity of the Eldorado Substation.

Alternative B

Alternative B parallels existing transmission lines throughout its length. There are existing access roads along the full length of Alternative B, and development of this alternative would require disturbances only for spur roads and at tower sites. Desert tortoises are likely present in the area, but their density is probably very low due to sparse vegetation cover over most of the length of the alternative. The impacts of Alternative B to biological resources would be only slightly greater than for the proposed route.

Alternative C

Alternative C would require the development of approximately 5.3 miles of new ROW and new access for just over half its length. Alternative C avoids crossing Ivanpah Lake. Potential impacts to biological resources for Alternative C are moderately higher than for the proposed route. Alternative C involves ground disturbance for access and spur roads, and at tower sites. Because of turns in the line, additional pulling and tensioning sites may be required that would involve a small quantity of additional ground disturbance. This alternative would have a greater impact on the desert tortoise and its habitat than the proposed route. Most of the Alternative C alignment is in higher quality desert tortoise habitat than the proposed route. Alternative C has some potential for impacts to rare plants which does not exist for the proposed route.

Alternatives D and E

Alternative D would require development of approximately 3.3 miles of new ROW and some new access road. Quality of desert tortoise habitat for this alternative is considered very low, and essentially equal to the proposed route. This route crosses the dry lake bed, saltbush scrub, and creosote bush scrub. Potential impacts to biological resources from selection of this alternative are not significantly higher than for the proposed route. There is only a very low potential for the presence of other sensitive wildlife or plant species occurring within the limits of this alternative. Alternative E is a very minor subset of Alternative D, and the potential impacts are the same as for Alternative D.

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4.5 CULTURAL AND PALEONTOLOGICAL RESOURCES

4.5.1 Regulatory Setting

4.5.1.1 Federal Definitions

Cultural Resources

Cultural resources consist of archaeological sites from the prehistoric and historic periods, and buildings, structures, and objects from the historic period. The Proposed Project can affect cultural resources as a result of removal of existing towers and transmission line, construction of new towers and stringing of transmission line, construction of a new substation, grading access roads, and use of pulling stations, splicing stations, construction yards and laydown areas, and batch plants.

The federal law that deals with cultural resources that could be affected by federal undertakings is the NHPA of 1966, as amended. Section 106 of the Act requires that federal agencies take into account the effect of a federal undertaking on properties listed in or eligible for the NRHP. The agencies must afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on the undertaking. A federal undertaking is a project that is federally funded or that requires a federal permit or license. Section 106 applies to the Project because the Project route crosses the BLM land and a permit from the BLM is required to construct the Project.

The regulations that stipulate the procedures for complying with Section 106 are in 36 CFR 800. The Section 106 regulations require:

- definition of the area of potential effect (APE)
- identification of cultural resources within the APE
- evaluation of the identified resources in the APE using NRHP eligibility criteria
- determination of whether the effects of the undertaking or project on eligible resources will be adverse
- agreement on and implementation of mitigation measures if there will be adverse effects

The federal agency must seek concurrence from the State Historic Preservation Officer (SHPO) and, in some cases, the ACHP, for its determinations of eligibility, effect, and proposed mitigation measures. Section 106 procedures for a specific project can be modified by negotiation of a Programmatic Agreement (PA) between the federal agency, the SHPO, and the Project proponent.

Effects to a cultural resource are potentially adverse only if the resource has been determined eligible for the NRHP by the lead federal agency with concurrence by the SHPO. The NRHP eligibility criteria are contained in the following statement:

> The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess aspects of integrity of location, design, setting, materials, workmanship, feeling, association, and:
>
> - is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage
> - is associated with the lives of persons important in our past
> - embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values
> - has yielded, or may be likely to yield, information important in prehistory or history

In addition, the resource must be at least 50 years old, except in exceptional circumstances (36 CFR 60.4).

Archaeological sites are usually evaluated under Criterion D, the potential to yield information important in prehistory. An archaeological test program may be necessary to determine whether the site has the potential to yield important data. The lead federal agency, in this case, the BLM, makes the determination of eligibility based on the results of the test program and seeks concurrence from the SHPO.

Paleontological Resources

Paleontological resources are protected from vandalism and unauthorized collection on federal land by the Federal Antiquities Act of 1906 (PL 59-209; 16 United States Code Section 431 *et seq.*; 34 Stat. 25). The NEPA of 1969, as amended, requires analysis of potential environmental impacts to important historic, cultural, and natural aspects of our national heritage (United States Code, Section 4321 et seq.; 40 Code of Federal Regulations, Section 1502.25). The BLM uses the Potential Fossil Yield Classification (PFYC) to classify geological formations by their potential to yield important fossils. The lowest sensitivity is PFYC Class 1 and the highest is PFYC Class 5.

4.5.1.2 State Definitions (California)

Cultural Resources

CEQA is the state law that applies to a project's impacts on cultural resources. A project is an activity that may cause a direct or indirect physical change in the environment and that is undertaken or funded by a state or local agency, or requires a permit, license, or lease from a state or local agency. CEQA requires that impacts to Historical Resources be identified and, if the impacts will be significant, that mitigation measures to reduce the impacts be applied.

An Historical Resource is a resource that (1) is listed in or has been determined eligible for listing in the CRHR by the State Historical Resources Commission, or has been determined historically significant by the CEQA lead agency because it meets the eligibility criteria for the CRHR; (2) is included in a local register of historical resources, as defined in Public Resources

Code 5020.1(k); or (3) has been identified as significant in an historical resources survey, as defined in Public Resources Code 5024.1(g) [CCR Title 14, Section 15064.5(a)].

The eligibility criteria for the CRHR are as follows [CCR Title 14, Section 4852(b)]:

(1) It is associated 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) It is associated with the lives of persons important to local, California, or national history.
(3) It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values.
(4) It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

In addition, the resource must retain integrity. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association [CCR Title 14, Section 4852(c)]. Resources that have been determined eligible for the NRHP are automatically eligible for the CRHR.

Archaeological sites are usually evaluated under Criterion 4, the potential to yield information important in prehistory. An archaeological test program may be necessary to determine whether the site has the potential to yield important data. The CEQA lead agency, in this case, the CPUC, makes the determination of eligibility based on the results of the test program.

<u>Paleontological Resources</u>

Appendix G of the CEQA Guidelines provides a checklist of questions that a lead agency should normally address if relevant to a project's environmental impacts. The sections of Appendix G that are relevant to an analysis of Geology and Paleontology are as follows:

Section (V) (c) asks if the project will directly or indirectly destroy a unique paleontological resource or site or unique geological feature.

The Assessment and Mitigation of Adverse Impacts to Non-Renewable Paleontologic Resources is a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. These guidelines were developed by a committee of the Society of Vertebrate Paleontologists (SVP), a national organization.

4.5.1.3 State Definitions (Nevada)

<u>Cultural Resources</u>

The NRS are the Nevada State laws that apply to a project's impacts on cultural resources. Under Title 33 – Libraries; Museums; Historic Preservation, Chapter 381 – State Museums, Sections 381.195 through 381.219 cover The Preservation of Prehistoric and Historic Sites. Chapter 383 – Historic Preservation and Archaeology, Sections 383.150 through 383.190 cover Protection of Indian Burial Sites and Sections 383.400 through 383.440 cover Protection of

Historic and Prehistoric Sites. Generally, these can be summarized as laws that stipulate that cultural resources investigations on historic or prehistoric sites on federal or state lands in Nevada require a valid permit from the director of the Department of Museums, as well as a permit from the appropriate federal agency if the site is on federal land. These laws also require that an investigation, exploration or excavation for which a permit is issued must benefit a reputable museum, university, college or other recognized scientific or educational institution for the purpose of permanent preservation in public museums or other recognized scientific or educational institutions. These laws also protect Native American graves on private and public land, and require a person to report to the Office of Historic Preservation immediately upon discovery of a previously unreported cairn or burial site of a native Indian disturbed through inadvertence while that person is engaged in a lawful activity such as construction, mining, logging or farming. The Office of Historic Preservation is directed to consult immediately with the Nevada Indian Commission and notify the appropriate Indian tribe. The revised statute also authorizes the Indian tribe, with the permission of the landowner, to inspect the site and recommend an appropriate means for the treatment and disposition of the site and all associated artifacts and human remains.

Paleontological Resources

As used in the forgoing NRS Sections 381.195 to 381.227 and Sections 383.400 to 383.440, a "Prehistoric site" applies to paleontological sites (including fossilized footprints and other impressions) as well as archaeological sites, ruins, deposits, petroglyphs, pictographs, habitation caves, rock shelters, natural caves, burial ground or sites of religious or cultural importance to an Indian tribe.

4.5.1.4 Local Definitions

Segments of the Project cross the jurisdiction of San Bernardino County that has ordinances or other requirements promoting the protection and preservation of cultural and paleontological resources. The CPUC has primary jurisdiction over the Project because it authorizes the construction, operation, and maintenance of public utility facilities in the State of California. Although such projects are exempt from local land use and zoning regulations and permitting, GO No. 131-D, Section III C requires "the utility to communicate with, and obtain the input of, local authorities regarding land use matters and obtain any non-discretionary local permits." Such consultation would include addressing issues that may arise concerning the following local ordinances, plans, and regulations related to cultural and paleontological resources.

Cultural Resources

The County of San Bernardino (Development Code Section 82.12.030 and Section 82.12.040) requires that development projects shall include a report prepared by a qualified professional that determines through appropriate investigation the presence or absence of archaeological and/or historical resources on the Project site and within the Project area, and recommends appropriate data recovery or protection measures.

The measures may include:

- site recordation
- mapping and surface collection of artifacts, with appropriate analysis and curation
- excavation of sub-surface deposits when present, along with appropriate analysis and artifact curation
- preservation in an open space easement and/or dedication to an appropriate institution with provision for any necessary maintenance and protection
- proper curation of archaeological and historical resource data and artifacts collected within a project area pursuant to federal repository standards. Such data and artifacts shall be curated at San Bernardino County Museum. Pursuant to State Historical Resources Commission motion dated February 7, 1992, the repository selected should consider 36 CFR 79, Curation of Federally owned and Administered Archaeological Collections, Final Rule, as published in the *Federal Register*, September 12, 1990, or as later amended, for archival collection standards.

Archaeological and historical resources determined by qualified professionals to be extremely important should be preserved as open space or dedicated to a public institution when possible (Section 82.12.040).

If Native American cultural resources are discovered during grading or excavation of a development site or the site is within a high sensitivity Cultural Resources Preservation Overlay District, the local tribe will be notified. If requested by the tribe, a Native American Monitor shall be required during such grading or excavation to ensure all artifacts are properly protected and/or recovered (Section 82.12.050).

Paleontological Resources

The County of San Bernardino (Development Code §82.20.030) requires that paleontologic mitigation programs include, but not be limited to:

- Field survey before grading - In areas of potential but unknown sensitivity, field surveys before grading shall be required to establish the need for paleontologic monitoring.
- Monitoring during grading - A project that requires grading plans and is located in an area of known fossil occurrence, or that has been demonstrated to have fossils present in a field survey, shall have all grading monitored by trained paleontologic crews working under the direction of a qualified professional so that fossils exposed during grading can be recovered and preserved. Paleontologic monitors shall be equipped to salvage fossils as they are unearthed to avoid construction delays, and to remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates. Monitors shall be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens. Monitoring is not necessary if the potentially fossiliferous units described for the property in question are not present, or if present are determined

upon exposure and examination by qualified paleontologic personnel to have low potential to contain fossil resources.

- Recovered specimens - Qualified paleontologic personnel shall prepare recovered specimens to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates. Preparation and stabilization of all recovered fossils is essential in order to fully mitigate adverse impacts to the resources.

- Identification and curation of specimens - Qualified paleontologic personnel shall identify and curate specimens into the collections of the Division of Geological Sciences, San Bernardino County Museum, an established accredited museum repository with permanent retrievable paleontologic storage. These procedures are also essential steps in effective paleontologic mitigation and CEQA compliance. The paleontologist must have a written repository agreement in hand prior to the initiation of mitigation activities. Mitigation of adverse impacts to significant paleontologic resources is not considered complete until curation into an established museum repository has been fully completed and documented.

- Report of findings - Qualified paleontologic personnel shall prepare a report of findings with an appended itemized list of specimens. A preliminary report shall be submitted and approved before granting of building permits, and a final report shall be submitted and approved before granting of occupancy permits. The report and inventory, when submitted to the appropriate Lead Agency along with confirmation of the curation of recovered specimens into the collections of the San Bernardino County Museum, will signify completion of the program to mitigate impacts to paleontologic resources.

4.5.2 <u>Significance Criteria and Approach to Impact Assessment</u>

4.5.2.1 Significance Criteria for Cultural Resources

<u>Federal</u>

Effects to NRHP-eligible resources are adverse (significant) if the Project may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. In other words, archaeological resources identified in the Project's APE that are determined eligible for the NRHP will be adversely (significantly) affected if they will be wholly or partially destroyed by the Project. Historical buildings, structures, and features identified in the Project's APE that are determined eligible for the NRHP will be adversely (significantly) affected if they will be demolished or altered to the extent that they would no longer be eligible.

<u>State</u>

Impacts to a Historical Resource, as defined by CEQA, are significant if the resource is demolished or destroyed or if the characteristics that made the resource eligible are materially impaired [CCR Title 14, Section 15064.5(a)]. CEQA Historical Resources include resources that are determined eligible for the NRHP or the CRHR. Whole or partial destruction of eligible archaeological sites would result in a significant impact. Demolition or alteration of eligible buildings, structures, and features to the extent that they would no longer be eligible would result in a significant impact.

4.5.2.2 Significance Criteria for Paleontological Resources

State (California)

Impacts to paleontological resources (fossils) are significant if fossils that could provide information about the taxonomy, morphology, and behavior of extinct species will be destroyed by the project.

4.5.2.3 Applicant's Proposed Measures

Cultural Resources

SCE has proposed APMs to avoid impacts to cultural resources or reduce impacts to cultural resources to a level of less than significant during the Proposed Project construction and operation. Emphasis is placed on avoiding impacts to cultural resources whenever feasible. Proposed measures applied to impacts related to construction activities will also take into account reasonably foreseeable effects of future Project operation and proposed measures will be adequate to prevent or mitigate potential adverse effects to unique archaeological sites, historical resources, and historic properties. Proposed APMs are consistent with applicable laws and regulations.

Ground-disturbing Project construction activities with the potential to affect cultural resources include:

- creating and using marshalling yards and staging/lay-down areas
- establishment, repair, reconstruction, and use of access roads and spur roads
- constructing new transmission line structures including
- clearing of footing locations
- pad grading
- installation of foundations
- structure assembly
- structure erection
- stringing conductor and ground wire
- establishing pulling sites
- constructing guard structures
- constructing it facilities
- establishing helicopter landing zones
- ground-disturbing demolition and reconstruction of existing facilities or new construction at existing facilities
- substation construction and/or expansion.

Proposed measures to avoid, minimize, or mitigate potential impacts of construction activities to cultural resources are defined below.

<u>APM CR-1: Conduct an intensive archaeological inventory of all areas that may be disturbed during construction and operation of the Project</u>. A complete cultural resource inventory of the Project area has been conducted, details of which are contained in a technical report. Should the Project substantially change and areas not previously inventoried for cultural resources become part of the construction plan, SCE shall ensure that such additional areas are inventoried for cultural resources prior to any disturbance. All surveys shall be conducted and documented as per applicable laws, regulations, and guidelines and in accordance with professional standards.

<u>APM CR-2: Avoid and minimize impacts to significant or potentially significant cultural resources wherever feasible</u>. To the extent practical, SCE shall avoid or minimize impacts to archaeological resources, regardless of its CRHR or NRHP eligibility status. This includes siting all ground-disturbing activities defined in Section 4.5.4.1 and other Project components outside a buffer zone established around each recorded archaeological site within or immediately adjacent to the ROW.

Because many archaeological resources comprise subsurface deposits, features, and artifacts, it may not be possible to recognize all potentially significant attributes of archaeological resources during construction activities. There is the potential for making unanticipated discoveries of previously unidentified remains at archaeological sites that could require efforts to reassess their CRHR or NRHP eligibility. Avoiding impacts or minimizing the area of an archaeological resource that could be affected during construction protects the resource and reduces the possibility that unanticipated discoveries would cause Project delays. SCE would avoid or minimize impacts to archaeological resources wherever practical by redesign, reroute, and implementation of avoidance procedures (i.e., establishing Environmentally Sensitive Areas), capping archaeological sites, or other protective measures within or immediately adjacent to access and spur roads that would be used during construction and operations activities.

Impacts will be avoided or minimized through the following measures prior to construction.

<u>APM CR-2a: Project Final Design shall avoid direct impacts to significant or potentially significant cultural resources</u>. To the extent practical, all ground-disturbing activities defined in Section 4.5.4.1 and other Project components shall be sited to avoid or minimize impacts to cultural resources listed as or potentially eligible for listing as, unique archaeological sites, historical resources, or historic properties.

<u>APM CR-2b: Conduct a pre-construction Worker Education Awareness Program</u>. The WEAP will be provided for all Proposed Project personnel who have the potential to encounter and alter unique archaeological sites, historical resources, or historic properties, or properties that may be eligible for listing in the CRHR or NRHP. This includes construction supervisors as well as field construction personnel. No construction worker will be involved in ground-disturbing activities without having participated in the WEAP.

The WEAP shall include, at a minimum:

- A review of applicable local, state and federal ordinances, laws and regulations pertaining to historic preservation
- A discussion of disciplinary and other actions that could be taken against persons violating historic preservation laws and SCE policies
- A statement by the construction company or applicable employer agreeing to abide by the Worker Education Program, SCE policies and other applicable laws and regulations
- A review of archaeology, history, prehistory, and Native American cultures associated with historical resources in the Proposed Project vicinity
- A review of the SCE "Unanticipated Cultural Resources Discovery Plan"

The Worker Education Program may be conducted in concert with other environmental or safety awareness and education programs for the Proposed Project, provided that the program elements pertaining to cultural resources is provided by a qualified instructor meeting applicable professional qualifications standards.

<u>APM CR-2c: Establish and maintain a protective buffer zone around each recorded archaeological site within or immediately adjacent to the ROW</u>. A protective buffer zone will be established around each recorded archaeological site and treated as an "environmentally sensitive area" within which construction activities and personnel are not permitted. Monitoring will be conducted to ensure that the protective areas are maintained.

<u>APM CR-3: Evaluate the significance of all cultural resources that cannot be avoided</u>. Cultural resources that cannot be avoided and which have not been evaluated to determine their eligibility for listing in the CRHR or NRHP will be evaluated to determine their historical significance. Evaluation studies shall be conducted and documented as per applicable laws, regulations, and guidelines and in accordance with professional standards.

Evaluation of properties will take into account attributes of each property that could contribute to its historical significance. Evaluation procedures will be consistent with applicable laws, regulations, and guidelines and in accordance with professional standards as follows.

<u>APM CR-3a: Evaluate the significance of archaeological resources potentially eligible for CRHR or NRHP listing</u>. Evaluation of archaeological sites would include scientific excavation of a sample of site constituents sufficient to understand the potential of a site to yield information to address important scientific research questions per CRHR eligibility Criterion 4 and NRHP eligibility Criterion D. Sites with rock art will be evaluated to consider their eligibility per CRHR Criterion 1, and NRHP Criterion A or C.

Archaeological testing as part of resource evaluation will be carried out in portions of affected sites to recover an adequate sample of cultural remains that can be used to evaluate the significance of a site per CRHR eligibility Criterion 4 or NRHP Criterion D. Archaeological testing will involve scientific excavations; identification of recovered cultural and ecological remains; cataloging, scientific analysis, and interpretation of recovered materials; preparation of scientific technical reports and reports comprehensible to the general public discussing the archaeological program and its results. Reports of any excavations at archaeological sites will be filed with the appropriate Information Center of the California Historical Resources Information System.

<u>APM CR-3b: Evaluate the significance of buildings and structures potentially eligible for CRHR or NRHP listing</u>. Evaluation of buildings and structures would take into account engineering, aesthetic, architectural and other relevant attributes of each property. Buildings and structures will be evaluated for historical significance per CRHR eligibility Criteria 1, 2, and 3, and NRHP criteria A, B, and C. A report of the evaluation of each building or structure will be prepared providing a rationale for an assessment of significance consistent with professional standards and guidelines. Reports of significance evaluations of buildings and structures will be filed with the appropriate Information Center of the California Historical Resources Information System.

<u>APM CR3c: If necessary, SCE will assist the BLM in consultation with Native Americans regarding traditional cultural values that may be associated with archaeological resources</u>. Archaeological or other cultural resources associated with the Project may have cultural values ascribed to them by Native Americans. SCE will assist the BLM during consultation with Native Americans regarding evaluations of resources with Native American cultural remains.

<u>APM CR-4: Minimize unavoidable impacts to significant cultural resources, including Unique Archaeological Sites, Historical Resources, and Historic Properties</u>. SCE will make reasonable efforts to avoid adverse Project effects to unique archaeological sites, historical resources, and historic properties. Nevertheless, it may not be possible to situate all Proposed Project facilities to completely avoid impacts to significant cultural resources. Impacts to significant cultural resources will be minimized by implementing the measures listed in APM CR-4a.

<u>APM CR4-a: Implement measures to minimize impacts to significant archaeological sites</u>. Prior to construction and during construction, the following measures will be implemented by SCE to minimize unavoidable impacts to significant archaeological sites.

- To the extent practical, all activities shall minimize ground surface disturbance within the bounds of unique archaeological sites, historical resources, or historic properties.

- Portions of significant archaeological sites, historical resources, or historic properties that can be avoided will be protected as environmentally sensitive areas and will remain undisturbed by construction activities.

- Monitoring by qualified professionals and/or Native Americans to ensure that impacts to sites are minimized will be carried out at each affected cultural resource for the period during which construction activities pose a potential threat to the site and for as long as there is the potential to encounter unanticipated cultural or human remains.

- Additional archaeological studies will be carried out at appropriate sites to ascertain if Project facilities could be located on a portion of a site and cause the least amount of disturbance to significant cultural materials.

- If impacts to significant archaeological (NRHP- or CRHR-eligible) sites cannot be avoided, archaeological data recovery will be carried out in the portions of affected significant sites that will be impacted. A data recovery plan will be prepared, reviewed by the appropriate agencies and then implemented in order to recover an adequate sample of cultural remains that can be used to address important research questions per CRHR eligibility Criterion 4 or NRHP Criterion D. Archaeological data recovery will involve scientific excavations; identification of recovered cultural and ecological remains; cataloging, scientific analysis, and interpretation of recovered materials; and preparation of a scientific technical report that describes the methods and results of the data recovery program.

- Reports of any excavations at archaeological sites will be filed with the appropriate Information Center of the California Historical Resources Information System.

<u>APM CR-4b: Implement measures to minimize impacts to significant buildings and structures</u>. Prior to construction and during construction, SCE will implement the following measures to minimize unavoidable impacts to significant buildings and structures.

- Locate Proposed Project facilities to minimize effects on significant buildings or structures.

- If impacts to significant buildings or structures cannot be avoided, document significant architectural and engineering attributes consistent with National Park Service Historic American Buildings Survey/Historic American Engineering Record documentation standards.

- File reports and other documentation with the National Park Service, if appropriate, and appropriate Information Center of the California Historical Resources Information System.

<u>APM CR-5: Prepare and Implement a Construction Monitoring and Unanticipated Cultural Resources Discovery Plan</u>. During construction it is possible that previously unknown archaeological or other cultural resources or human remains could be discovered. Prior to construction SCE will prepare a *Construction Monitoring and Unanticipated Cultural Resources Discovery Plan* to be implemented if an unanticipated discovery is made. At a minimum the plan shall detail the following elements:

- Worker and supervisor training in the identification of cultural remains that could be found in the Proposed Project area

- Worker and Supervisor response procedures to be followed in the event of an unanticipated discovery, including appropriate points of contact for professionals qualified to make decisions regarding the potential significance of any find

- Identification of persons authorized to stop or redirect work that could affect the discovery and their on-call contact information

- Provide for monitoring of construction activities in archaeologically sensitive areas

- Stipulate a minimum radius around any discovery within which work will be halted until the significance of the resource has been evaluated and mitigation implemented as appropriate

- Procedures for identifying and evaluating the historical significance of any find

- Procedures for consulting Native Americans in the process of identification and evaluation of significance of discoveries involving Native American cultural materials

- Procedures to be followed for the treatment of discovered human remains per current state law and protocol developed in consultation with Native Americans

<u>APM CR-6: Inadvertent Discovery of Human Remains</u>. Any human remains discovered during Project activities in California will be protected in accordance with current state law, specifically Section 7050.5 of the California Health and Safety Code, Section 5097.98 of the California Public Resources Code, and Assembly Bill 2641. The provisions of the NAGPRA are applicable when Native American human remains are found on federal land (BLM land in California and Nevada). The discovery of human remains will be treated as defined in the *Construction Monitoring and Unanticipated Cultural Resources Discovery Plan*.

Archaeological excavations at sites will not, if at all possible, inappropriately disturb or remove human remains. Native Americans will be consulted to develop a protocol to be followed if human remains are encountered during any Project activity, as required by state and federal law.

When human remains are discovered, work must cease around the find and the area will be flagged off to protect the discovery from disturbance (AB 2641 and NAGPRA). The discovery must be reported immediately to the County Coroner (Section 7050.5 of the Health and Safety Code). If the Coroner determines the remains are Native American, the Coroner notifies the Native American Heritage Commission which then designates a Native American Most Likely Descendant (MLD) for the Project (Section 5097.98 of the Public Resources Code). The designated MLD then has 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains (AB 2641). If the landowner does not agree with the recommendations of the MLD, the NAHC can mediate (Section 5097.94 of the Public Resources Code). If no agreement is reached, the landowner must rebury the remains where they will not be further disturbed (Section 5097.98 of the Public Resources Code). This will also include either recording the site with the NAHC or the appropriate Information Center; using an open space or conservation zoning designation or easement; or recording a document with the county in which the property is located (AB 2641). NAGPRA also requires notification of the appropriate Native American group and certification by that group before the ground-disturbing activity is resumed.

<u>APM CR-7: Native American Participation</u>. Prior to construction BLM will consult with Native Americans identified by the NAHC as having cultural ties to particular areas of the Proposed Project. Native Americans will be consulted regarding their participation during significance evaluations and data recovery excavations at archaeological sites with Native American cultural remains, and monitoring during Project construction. Native Americans will be consulted to develop a protocol for working with each group should human remains affiliated with that group be encountered during Project activities.

Paleontological Resources

The following APMs were developed to avoid and minimize the potential impacts of Project construction on paleontological resources to a less than significant level. The APMs were derived from the guidelines of the SVP and meet the requirements of CEQA. Such measures have been used throughout California and have been demonstrated to be successful in protecting paleontological resources while allowing timely completion of construction.

<u>APM PALEO-1: Retention of Paleontologist</u>. Prior to construction, a certified paleontologist would be retained by SCE to supervise monitoring of construction excavations and to produce a Paleontological Resource Management Plan (PRMP) for the Proposed Project. The PRMP would be prepared and implemented under the direction of the paleontologist and would address and incorporate the PALEO-2 through PALEO-8. Paleontological monitoring would include inspection of exposed rock units and microscopic examination of matrix to determine if fossils are present. The monitor would have authority to temporarily divert grading away from exposed fossils in order to recover the fossil specimens. More specific guidelines for paleontological resource monitoring can be found in the PRMP.

<u>APM PALEO-2: Conduct a Pre-construction Paleontological Field Survey</u>. The paleontologist and/or his designated representative will conduct a pre-construction field survey of the Project area underlain by Tertiary rock units and older alluvium. Results of the field inventory and associated recommendations would be incorporated into the PRMP.

<u>APM PALEO-3: Environmental Training</u>. Training would be provided to construction supervisors and crew with environmental awareness training regarding the protection of paleontological resources and procedures to be implemented in the event fossil remains are encountered by ground-disturbing activities.

<u>APM PALEO-4: Construction Monitoring</u>. Ground-disturbing activities would be monitored on a part-time or full-time basis by a paleontological construction monitor only in those parts of the Project area where these activities will disturb previously undisturbed strata in rock units of moderate and high sensitivity. Quaternary Alluvium, colluvium, and Quaternary Landslide Deposits have a low paleontological sensitivity level and would be spot-checked on a periodic basis to ensure that older underlying sediments are not being penetrated. Monitoring would not be implemented in areas underlain by younger alluvium unless these activities have reached a depth 5 feet below the present ground surface and fine grained strata are present. Ground-disturbing activities in areas underlain by rock units of low sensitivity would be monitored on a quarter-time basis or spot checked if fine grained strata are present.

<u>APM PALEO-5: Recovery and Testing</u>. If fossils are encountered during construction, construction activities would be temporarily diverted from the discovery and the monitor would notify all concerned parties and collect matrix for testing and processing as directed by the Project Paleontologist. In order to expedite removal of fossil-bearing matrix, the monitor may request heavy machinery to assist in moving large quantities of matrix out of the path of construction to designated stockpile areas. Construction would resume at the discovery location once the all necessary matrix was stockpiled, as determined by the paleontological monitor. Testing of stockpiles would consist of screen washing small samples to determine if important fossils are present. If such fossils were present, the additional matrix from the stockpiles would

be water screened to ensure recovery of a scientifically significant sample. Samples collected would be limited to a maximum of 6,000 pounds per locality.

APM PALEO-6: Prepare Monthly Progress Reports. The Project Paleontologist would document interim results of the construction monitoring program with monthly progress reports. Additionally, at each fossil locality, field data forms would record that locality, stratigraphic columns would be measured, and appropriate scientific samples submitted for analysis.

APM PALEO-7: Analysis and Prepare Final Paleontological Resource Recovery Report. The Project Paleontologist would direct identification, laboratory processing, cataloguing, analysis, and documentation of the fossil collections. When appropriate, and in consultation with SCE, splits of rock or sediment samples would be submitted to commercial laboratories for microfossil, pollen, or radiometric dating analysis. After analysis, the collections would be prepared for curation (see APM PALEO-9). A final technical report would be prepared to summarize construction monitoring and present the results of the fossil recovery program. The report would be prepared in accordance with SCE, Society of Vertebrate Paleontology guidelines, and lead agency requirements. The final report would be submitted to SCE, the lead agency, and the curation repository.

APM PALEO-8: Curation. Prior to construction, SCE would enter into a formal agreement with a recognized museum repository and would curate the fossil collections, appropriate field and laboratory documentation, and the final Paleontological Resource Recovery Report in a timely manner following construction.

Implementation of the APMs would avoid and minimize all potential impacts to paleontological resources to a less-than-significant level.

4.5.3 Environmental Setting

4.5.3.1 Regional Setting

Paleontology

Earlier Precambrian Metamorphic Rocks

Earlier Precambrian metamorphic rocks have been mapped (Jennings 1961; Longwell et al. 1965) at the surface along the project corridor in the McCullough Range in Nevada and in the Clark Mountain vicinity in California. These exposures of gneiss and schist with intrusive metaigneous rocks have low potential to contain significant nonrenewable paleontologic resources, and so are assigned low paleontologic sensitivity.

Undivided Paleozoic Marine Rocks

Undivided Paleozoic marine rocks have been mapped (Jennings 1961) at the surface along the Project corridor in the Clark Mountain vicinity, California. These rocks generally yield fossil remains of marine invertebrates. Fossils of this nature are abundant and widespread throughout the southern Nevada region, to such a degree that these fossils are not generally considered to have high paleontologic significance. Time-diagnostic invertebrates from these rocks have somewhat higher significance, but are still relatively common in the region.

However, there is also the potential for caves to be present in such Paleozoic limestone rocks. A kind of cave termed a “solution cave” frequently forms in limestone rocks; percolation of acidic groundwater through the limestone dissolves the carbonate material and leaves behind fissures, caves or caverns. Not infrequently, caves that during earlier epochs opened to the surface accumulated significant fossil remains. For example, in mountainous regions carnivorous birds often roost near cave openings, and the remains of their meals as well as the skeletons of the birds themselves would fall into the cave. Since carnivores also use caves for dens, their bones and the bones of their respective prey animals can also be preserved in caves. Wood rats also den in caves, and the middens created by such animals are uniquely informative paleontologic resources. Finally, but less frequently, Pleistocene large mammals could be unfortunate enough to fall into such caves. These are just some of the ways in which caves in limestone rocks can become paleontological treasure troves. Similar caves elsewhere in the Mojave Desert have been previously reported to contain vertebrate fossil remains (Goodwin and Reynolds 1989; Force 1991; Reynolds et al. 1991a, b, c, d; Scott 1997; Scott and Cox 2008). Should such cave deposits be encountered at depth anywhere along the Proposed Project alignments, they would be scientifically significant and so have high paleontologic sensitivity.

Tertiary Volcanic Rocks

Surface exposures of these rocks have been mapped (Longwell et al. 1965) along the project corridor in the McCullough Range in Nevada. Tertiary volcanic rocks in the Mojave Desert have low potential to contain significant fossil resources and are therefore assigned low paleontologic sensitivity.

Pleistocene Older Alluvium (Undifferentiated)

Pleistocene older alluvium has been mapped (Jennings 1961) at the surface along the Project corridor in the Clark Mountain vicinity, California. Older Pleistocene sediments throughout southern California (Anderson et al. 2002; Jefferson 1991; Reynolds and Reynolds 1991; Scott 1997; Springer and Scott 1994; Springer et al. 1998, 1999, 2007; Woodburne 1991) and the Mojave Desert (Jefferson 1989, 1991; Reynolds 1989; Scott 1997; Scott et al. 1997; Scott and Cox 2002, 2008) have been repeatedly demonstrated to be highly fossiliferous. Where present at the surface or at depth along the alignments of the proposed Eldorado-Ivanpah Transmission Line, these sediments would have high potential to contain significant nonrenewable paleontologic resources, and so would be assigned high paleontologic sensitivity.

Holocene alluvium: Holocene alluvium has been mapped (Jennings 1961; Longwell et al. 1965) at the surface along the length of the project corridor in California and Nevada. The Holocene Alluvium is especially deep in the Ivanpah Basin where the total depth of alluvium (Pleistocene and Holocene alluvium) is in excess of 800 feet (Department of Water Resources [DWR] 2004). Many of the above-described geologic formations are overlain intermittently by Quaternary (Pleistocene or Recent) alluvium. Depending upon the age at which this alluvium was laid down, which cannot be determined with any precision *a priori*, this lithologic unit may also have high paleontologic sensitivity. Near the northern end of Ivanpah Lake, for example, large mammal bone fragments were recovered from sediments mapped (Longwell et al. 1965) as Quaternary alluvium identical to that along portions of the proposed alignments. Similarly, surface exposures of Quaternary alluvium near Glendale, Nevada yielded mammal fossils including a tooth of extinct horse (*Equus* sp.).

Prehistory

Fluted Point or Pleistocene Period (Pleistocene/Holocene Transition) – 10,000 BC to 8000 BC

The presence of humans in the Mojave Desert prior to 10,000 BC cannot be discounted in the face of growing evidence of earlier occupation of other regions of North America. The oldest well-identified cultural complex in the Mojave, however, is Clovis (10,000 BC to 8000 BC), characterized by the long, fluted Clovis projectile point. Reliable radiocarbon dates for organic material associated with fluted points in the Mojave Desert are lacking, but obsidian hydration has established that they have older relative ages than stemmed points from the same region. Only one possible Clovis occupation site has been found, at China Lake, while other fluted points have been recorded as isolated finds. Very little can be inferred about the people who created these fluted points, except that they most likely lived in highly mobile small groups and camped near reliable sources of water. Fluted point finds are concentrated in the China Lake and Lake Thompson areas, which are known to have had significant stream runoff and to have been good water sources during the Pleistocene/Holocene Transition, continuing during the early Holocene (Sutton et al. 2007). Note that Lake Thompson is the predecessor of Rosamond, Rogers, and Buckhorn lakes.

Lake Mojave Period (Early Holocene) – 8000 BC to 5000 BC

The best-documented cultural complex in the region during the early Holocene is the Lake Mojave period, characterized by Great Basin Stemmed (Lake Mojave and Silver Lake) points, numerous bifaces, unifaces, crescents, and sometimes ground stone artifacts. Non-local lithic materials and shell beads in Lake Mojave assemblages indicate long foraging trips and/or trade with other regions. The small number of ground stone implements, and the lack of extensive wear on them, suggests that vegetal resources were not used heavily. As with the Fluted Point Period, social groups of the Lake Mojave Period appear to have been small, highly mobile, and attracted to a variety of environments where water was available. Interestingly, archaeofaunal data indicate a reliance on small game like rabbits, hares, rodents, and reptiles, rather than bigger game implied by the large projectile points. Lake Mojave Period artifacts have been mostly surface finds, making absolute dating by radiocarbon methods difficult (Sutton et al. 2007). Numerous Lake Mojave Period artifacts have been documented at Rosamond Lake (Edwards AFB), ancient Lake Mojave (Silver and Soda dry lakes), and on neighboring military installations such as Fort Irwin, China Lake Naval Air Weapons Station (NAWS), and Twentynine Palms.

Pinto Period (Early to Middle Holocene) – 5000 BC to 2000 BC

Previous investigators (e.g., Warren 1984) defined the Pinto Period as a response to Mid-Holocene climatic warming and desiccation in the Great Basin, including the Mojave Desert. In this scenario, the Pinto Period began after the Lake Mojave Period at about 5000 BC, corresponding roughly with the Holocene Maximum warming trend. At first, groups of hunter-gatherers adapted to the drying, warming conditions, possibly by abandoning the desert floor and occupying the higher, wetter margins for a thousand years or more. As the climate cooled again, the desert was repopulated as springs, streams, and shallow lakes reappeared (Warren 1984). Information gathered during the past two decades suggests that the Pinto Period began during the early Holocene and overlapped the Lake Mojave Period. Recently obtained radiocarbon dates from Pinto Basin, Little Lake, Fort Irwin, and Twentynine Palms indicate ages of at least 9,000 years for some Pinto sites (Sutton et al. 2007). Although there is still some debate about the inception of the Pinto complex, it is clear that it is probably older than had been previously thought.

Pinto artifact assemblages have less diversity of lithic materials than their Lake Mojave predecessors, suggesting a reduced range. At the same time, the presence of *Olivella* shell beads suggests that there was trade with coastal groups. Ground stone milling tools are much more prevalent than in Lake Mojave assemblages, indicating that extensive plant food processing began at the end of the early Holocene, before the beginning of the dry, warm conditions that affected the desert floor during the middle Holocene (Sutton et al. 2007).

At around 3000 BC, near the end of the Pinto Period, Northern Uto-Aztecans probably migrated into the Mojave Desert, particularly the western Mojave, presumably from what is now northern Mexico. Over the next two millennia, this population evolved into the Tubatulabalic, Hopic, Numic, and Takic language groups (Sutton et al. 2007).

Gypsum Period (2000 BC to AD 500)

Near the end of the middle Holocene, harsh climatic conditions associated with the Holocene Maximum warming trend (also known as the Altithermal) may have resulted in very low population densities, and even temporary abandonment, of large expanses of the Mojave Desert. Very few sites have been dated to a time span between about 3000 BC and 2000 BC that separates the Pinto and Gypsum complexes. The appearance of corner-notched (Elko), concave-base (Humboldt), and contracting-stemmed (Gypsum) projectile points in late Holocene sites of the western and northern Mojave signals the beginning of the Gypsum Period, as temperatures began to ameliorate during the First Neoglacial episode at the beginning of the late Holocene (Sutton et al. 2007; Warren 1984).

In addition to the characteristic projectile point types, Gypsum assemblages include leaf-shaped points, stone knives, flake scrapers, T-shaped drills, choppers, hammer stones, shaft smoothers, ornamental items, split-twig animal figures, and paint. Some of these items, along with the presence of rock art, suggest ritual activities. Manos, metates, mortars, and pestles are found also (Sutton et al. 2007; Warren 1984). Gypsum sites are generally smaller and more numerous than earlier components, and are spread over a wider variety of environments. Socio-economic contact with the California coast is indicated by the presence of shell beads. Gypsum Period sites show evidence of exploitation of split-hoofed animals, rabbits, hares, and rodents, as well as hard seeds and mesquite. Better technology and somewhat more complex social organization (compared to the previous Pinto population) probably helped peoples of the Gypsum complex adapt to the warming and drying conditions that began again after about 2,000 years ago. A more successful adaptation to the warm dry conditions is indicated because another population hiatus did not occur in the Mojave Desert during this period (Sutton et al. 2007; Warren 1984). By around 1000 BC, the Northern Uto-Aztecan peoples who had probably come from northern Mexico around the end of the Pinto Period had separated into Tubatulabalic, Hopic, Numic, and Takic language groups (Sutton et al. 2007).

Saratoga Spring or Rose Spring Period (Late Holocene) – AD 500 to AD 1200

Although the climate was warmer at the beginning of the Saratoga Spring Period than it had been during the First Neoglacial episode, conditions were sufficiently mesic to support springs and streams in the Mojave Desert, and possibly even shallow perennial lake stands at some of the desert playas (Sutton et al. 2007). Archaeological data suggest a significant increase in population, especially in the western Mojave. Projectile points indicate that the bow and arrow were introduced to the Mojave Desert during the Saratoga Spring Period. While they probably do not indicate a major cultural change in the region (Warren 1984), they were a technological advance that may have improved hunting efficiency and increased the carrying capacity of the land, resulting in a rise in population (Sutton et al. 2007).

Saratoga Spring sites in the southern Mojave Desert reflect the influence of Yuman Hakataya culture from the lower Colorado River by the inclusion of buffware and brownware pottery sherds and Desert Side-Notched and Cottonwood points. Hakataya intrusion or influence probably extended as far north and west as the east side of Antelope Valley (Warren 1984). Anasazi pottery and turquoise mining sites indicate the presence and influence of Pueblo peoples in the eastern Mojave during the Saratoga Spring Period (Warren 1984). In the western Mojave, particularly Antelope Valley, the effects of Hakataya and Anasazi contact or intrusion appear to have been minimal. Large village sites with cemeteries and well-developed middens, indicating long-term occupations, have been documented there. Among the artifacts found in Saratoga Spring sites of the Antelope Valley are steatite items and large numbers of shell beads, probably indicating trade with coastal groups (Sutton et al. 2007; Warren 1984).

The rise in temperature and return to xeric conditions and occasional severe droughts associated with the Medieval Climatic Anomaly affected roughly the second half of the Saratoga Spring Period, beginning around AD 700. Deteriorating climatic conditions in the Mojave Desert led to a population decline, and may have been partially responsible for bringing the Saratoga Spring complex to an end around AD 1100 (Sutton et al. 2007).

Late Prehistoric Period (Late Holocene) – AD 1200 to Contact (1770)

The several tribes occupying the Mojave Desert at the time of contact with Europeans are believed to have had their genesis in the separate cultural complexes that developed during the Late Prehistoric Period (Sutton et al. 2007; Warren 1984). Toward the end of the Medieval Climatic Anomaly, the population of the Mojave continued a decline that had begun during the Saratoga Spring Period. Hakataya (Yuman) and Anasazi cultural influences remained in the eastern and southern parts of the region. By around AD 1000, the Numic speakers of the western Mojave Desert had differentiated into Southern Paiute, spreading eastward and occupying an area north of the Mojave River, and Shoshone, whose territory was farther north. South of the Mojave River, and in much of southern California, Takic speaking groups were predominant (Sutton et al. 2007).

Late Prehistoric sites are abundant in the Mojave Desert, and range from temporary campsites to large villages with middens and cemeteries. Artifacts include Desert series projectile points, ground stone milling tools, shell beads, incised stones and pendants, and brownware and buffware ceramics. Obsidian was not used as frequently as during earlier periods. Faunal remains at archaeological sites indicate that deer, rabbits, hares, rodents, and reptiles were eaten, along with a wide variety of vegetal foods, indicated by ground stone grinding implements (Sutton et al. 2007). Trade, especially along the Mojave River and in the Antelope Valley, appears to have enabled the transport of resources over long distances, possibly mitigating against shortages and making a more sedentary, village-oriented existence possible during the late Prehistoric Period (Warren 1984).

Ethnography

The area of the Great Basin most associated with the Southern Paiute peoples stretches through the Colorado River valley from the far eastern deserts of Southern California south of the Sierra Nevada Mountain Range east across the Southern Nevada inverted triangular boundary with northwestern Arizona and through the southwestern corner of Colorado (Steward 1937). The Southern Paiute, along with the Ute peoples to the east, speak the Ute language, part of the Southern Numic branch of the Uto-Aztecan language family. While the Ute and Southern Paiute are related linguistically, the Southern Paiute are culturally more similar to other Great Basin Numic-speaking groups than they are to the Utes, most of whom lived outside the Great Basin to the east.

The Southern Paiute are defined as a hunter-gatherer foraging culture that manufactured a variety of stone tools and effigies, fashioned multiple types of baskets, cured brownware pottery and sketched and engraved petroglyphs throughout the southern Great Basin, including the eastern Mojave Desert. Subgroups within the Southern Paiute include the Chemehuevi, Las Vegas, Moapa, Pahranagat, Panaca, Gunlock, Saint George, Shivwits, Uinkaret, Cedar, Beaver, Panguitch, Kaibab, Kaiparowits, Antarianunts, and San Juan (Kelly and Fowler 1986).

Settlement Patterns - The Southern Paiute groups were mobile, moving from high to low country depending on seasons and foods available. Some groups spent winters at higher elevations, building conical or subconical thatch structures supported by a tree limb serving as a ridgepole. Caves were also utilized during winter months. During the summer months, trees provided shade and were modified with the addition of tossed brush to provide denser cover. The Chemehuevi and Cottonwood tribes of Southern Nevada and Northern Arizona area lived in earth-covered dwellings. Canvas and skin-covered structures, as well as sweathouses, were adapted from the Ute during the mid-to-late ninteenth century (Kelly and Fowler 1986).

Subsistence - Southern Paiute food resources were sometimes scarce and nearly all groups report starvation foods and seasonal scarcity despite efforts to store and preserve food for such periods. Subsistence was dependent upon resources available within the natural environment, which differed by region. Areas occupied by the Southern Paiute range from high plateaus to basins to arid desert. Vegetation in the high plateau areas consists of spruce and firs, while juniper and sage grow throughout the basin and creosote and mesquite in the desert. Groups living on the plateaus ate pine nuts while other groups ate other types of seeds. Seeds were often dried and ground into meal that could be used in the preparation of bread or porridge-like foods. The perennial agave plant served as a main dietary staple throughout the year. During spring, fruits and berries were collected.

Hunters took both small and large game. Small game was the predominant source of protein and might include rodents, birds, squirrels and chipmunks, reptiles, and tortoise. Eggs and insects also served as sources of protein. Larger game was taken using bow and arrow. Hunters would wait in strategic locales for animals, including mountain sheep and antelope, to be herded past them by hunting cohorts. Hunting was aided through ritual petroglyph sketching and through practices such as leaving male infants' umbilical stumps in a squirrel hole or along the track of a mountain sheep (Kelly and Fowler 1986).

Euro-American Contact - The first documented contact between the Spanish and Southern Paiute occurred in 1776 when priests Francisco T.H. Garcés, Francisco Atanasio Domínguez, and Escalante passed through the region. It was not until the early nineteenth century, however, that direct impacts of Spanish colonization were felt. Baptisms of Paiutes began by 1810 in Spanish settlements along the upper Rio Grande (Brugge 1968). The Paiutes were positioned along the Old Spanish Trail which became a route for the transfer of Paiute slaves by the 1830s (Kelly and Fowler 1986:386).

Paiute slave trading ended in the 1850s with the introduction of territorial legislation and the influence of Brigham Young and Mormon settlement in Nevada and Utah. Mormon interaction with natives was relatively benign in comparison to prevailing non-Mormon Euro-American attitudes. Mormon ideology regarded the identity of Native Americans as being descendents of the lost Tribes of Israel and Mormon influence helped to put a stop to Paiute slave trading. However, even as Mormon-native interaction was generally favorable, Mormon settlement was largely responsible for the displacement of many Southern Paiute communities, as was the arrival of Euro-American miners and other settlers (Kelly and Fowler 1986:387).

Southern Paiute response to Euro-American encroachment on native territories included, but was not limited to, raids. Paiutes and Bannock allies gathered for a conference in 1860 to discuss solutions to the increased settlement in the area brought about with the discovery of the Comstock Lode in Nevada in 1859. The conference was interrupted with news that a group of Bannocks had killed three whites and burned the Pony Express stop at William's Station in retaliation for the capture of two Bannock women. This action ultimately resulted in the Pyramid Lake War of 1860. Natives were defeated by American forces bringing an official conclusion to the war. Indian raids targeting the Pony Express and stage stations, however, continued throughout the following decade (Elliot 1973).

The American government began making strides towards resettling the Southern Paiutes on a reservation in the mid-1860s. In 1874, President Grant issued an executive order expanding the Moapa Reservation in order to increase its capacity and resettle Southern Paiute tribes on it. The Utah Southern Paiutes were the first to resettle. Meanwhile, some of the Chemehuevi were removed to the Colorado River Reservation though many refused and others joined the Cahuilla and Serrano tribes on the California side of the Mojave Desert. Later reservations were established in the early part of the twentieth century including the Chemehuevi Reservation on the Colorado River near Parker, Arizona in 1907; the Las Vegas Colony near the City of Las Vegas in 1911; the Indian Peaks Reservation northwest of Cedar City, Utah in 1915; the Koosharem Reservation east of Ritchfield, Utah in 1928; and the Kanosh Reservation near Kanosh Utah in 1929 (Kelly and Fowler 1986:391).

History

Nevada obtained statehood in 1864. Early statehood economy, settlement, and politics were based almost solely on mining in western Nevada around Virginia City. The southern portion of the state developed much more slowly than the northern portion as it was neither used for fur trapping nor as part of a route used during California's Gold Rush.

The southern portion of Nevada was originally part of New Mexico territory. This area became part of Lincoln County, Nevada in 1867. In 1908 Lincoln County was divided with the southernmost portion becoming Clark County. Las Vegas ("The Meadows" in Spanish) was named county seat of Clark County. Las Vegas had long been known for its hospitable environment relative to the surrounding desert area. Natural springs welcomed travelers and provided relief. Later that natural water source was applied to agriculture. The sale of acreage formerly a part of Stevens Ranch initiated the birth of Las Vegas as a town (Squires 1912:795-798).

The western edge of Clark County is situated along the California-Nevada state line. The first officially recognized state line between California and Nevada was established by Allexy W. Von Schmidt, United States astronomer and surveyor in 1873. Von Schmidt used solar observations to approximate the dividing line between California and Nevada. His observations were slightly off, and Von Schmidt placed the line three-quarters of a mile southwest of the actual boundary. The false boundary was marked by cast-iron columns (CERES n.d.). The original boundary demarcated by Von Schmidt has been designated California Registered Historical Landmark No. 859.

The area of Primm was associated with bootlegging activities during Prohibition (1920-33). "Whiskey Pete" is a prominent figure in the area's history, particularly with regards to bootlegging. Whiskey Pete was Pete McIntyre, a local gas station owner who supplemented his income with sales of moonshine he produced in secrecy in local mountain caverns. Ernie Primm, a casino entrepreneur, who had owned and operated casinos in Los Angeles County and later the Primadonna Casino in Reno, purchased McIntyre's property in around 1950 and subsequently developed a casino on the property.

A railway line which crosses the current project area was developed by the San Pedro, Los Angeles, and Salt Lake Railroad Company (SP, LA&SL) in 1905. The line originated in Salt Lake City, Utah and terminated in San Pedro, California. This rail line was bought by Union Pacific Railway in 1921 and has been operated by Union Pacific since then (Signor 1988). Stops on the SP, LA&SL line in the immediate area included Calada (near present-day Yates Well Road) and Nipton in California and, on the Nevada side of the state boundary, Roach, Borax, Jean, and Sloan.

The town of Nipton is situated south of Ivanpah Lake. Nipton developed at the intersection of two wagon trails, one running east-west from Colorado to the Ivanpah mine and settlement, the other running north-south from Goodsprings to the railroad and then to the mining settlement of Goffs near present-day Needles, California. Samuel Dunc Karns, a Pennsylvania native staked a mining claim in the area in 1900, naming it Nippeno. The town name of Nipton was later derived from the Nippeno name. The San Pedro, Los Angeles and Salt Lake Railroad built their line through Nippeno in 1905. The rail station continued to operate in Nipton until the 1950s (Freeman 2005).

Transmission Lines - Utility transmission lines run through the area including the line proposed for upgrades as the focus of this project. The transmission of electricity in Southern Nevada began in order to supply power to the settlement at Las Vegas in 1906. Power was provided by the utility company Consolidated Power and Telephone. In the years following, the company added small, gas powered generators and by 1912 had three hydroelectric plants generating 16,500 horsepower and a web of 350 miles of transmission lines (Elliott 1973). In 1914, a deal was struck allowing Consolidated Power to purchase all of its electricity from the railroad power house, presumably that of the SP, LA&SL Railroad Company (Sierra Pacific Resources History).

In 1928 federal funds were appropriated for the building of the Boulder (Hoover) Dam. A great deal more energy would be required for construction efforts than what could be generated by local power sources, and indeed, a reason for building the dam itself was to generate power for the region. The utility line running through present-day Primm, Nevada from California to just west of Boulder City was installed in 1930-1931 in order to carry power from San Bernardino and Victorville to Boulder City for the dam construction effort. The entire length of the line took less than eight months to complete. Delivery of power to the dam construction site was celebrated with fanfare as being the “First major unit of Boulder Dam completed.”

The Southern Sierra Power Company was a subsidiary of the Nevada-California Electric Company that was formed in 1911 (Di Pol 2007). These utility companies earned nearly $3 million in revenue from power transmission associated with the construction of the dam alone. Upon completion of the Boulder/Hoover Dam, the same lines were used to transmit power in the opposite direction. Power, then generated hydro-electrically at the dam, was carried westward to the more heavily populated Los Angeles region. The utility lines remained under the ownership of The Nevada-California Electric Company/Southern Sierra Power Company and their later parent companies, including California Electric Power Company (1941-1964) and Southern California Edison (1964-Present) (Di Pol 2007).

4.5.3.2 Local Setting

Cultural Resources

Cultural resources records searches were conducted with the San Bernardino County Archaeological Information Center, located at the San Bernardino County Museum in Redlands, California; the Harry Reid Center for Environmental Studies, located at the University of Nevada, Las Vegas; and an on-line search with the Nevada Cultural Resources Information System (NVCRIS). The purpose of the records searches was to determine the extent of previous cultural resources investigations within a 1-mile radius of the Project area, and to determine whether any archaeological sites or architectural resources have been previously identified within the Project area. Materials reviewed as part of the records searches included archaeological site records, historic maps, and listings of resources on the NRHP, the CRHR, California Points of Historical Interest, California Landmarks, National Historic Landmarks, Nevada Historical Markers (Nevada SHPO n.d.a), and the Nevada State Register of Historic Places (Nevada SHPO n.d.b). Records searches were not conducted at either of the BLM field offices following assurances that their records were not as current as those data repositories mentioned above.

Tables 4-14 and 4-15 summarize the results of the records search completed for the Nevada and California segments of the project. They list 129 previously recorded sites (38 in Nevada and 93 in California including two sites (26CK5685/36-1910 and 26CK4957/36-7694) recorded in both states) within a one-mile buffer of the Project APE. Sixteen of these previously recorded resources lie within the APE. Resources within the APE are shown in bold.

TABLE 4-14
PREVIOUSLY RECORDED ARCHAEOLOGICAL SITES WITHIN 1-MILE OF APE - NEVADA

Site Number	Description	Within APE (Y/N)	Project Segment	USGS Quadrangle	NRHP Eligibility
26CK170 (CrNV-05-2336	Native American Battleground	N	Path 2-Section 1	Crescent Peak	Unevaluated
26CK211 (CrNV-05-4134)	sparse flaked stone and sherd scatter	N	Proposed	Roach	Unevaluated
26Ck1618 (CrNV-53-4955)	Rockshelter	N	Alternative C	Ivanpah Lake	Unevaluated
26CK1620	Sparse flaked stone and sherd scatter	N	Alternative C	Roach	Unevaluated
26CK1621	Sparse flaked stone scatter	N	Proposed	Roach	Unevaluated
26CK2110 (CrNV-05-4133)	Small campsite	N	Path 2-Section 1	Crescent Peak	Unevaluated
26CK2111	Lithic and ceramic scatter	N	Proposed	Roach	Unevaluated
26CK2114 (CrNV-05-4132)	Possible trail	N	Path 2-Section 1	McCullough Mountain	Unevaluated
26CK2216 (Cr-NV-2110)	Roach Railroad Station	N	Proposed	Roach	Not Significant
26CK2632	Sparse sherd and flaked stone scatter	N	Alternative C	Roach	Unevaluated
26CK2633 (CrNV-05-659)	Flaked stone scatter	Y	Proposed	Roach	Unevaluated
26Ck2949 (CrNV-53-4263)	Historic structure	N	Path 2-Section 1	Crescent Peak	Unevaluated
26Ck2950 (CrNV-53-4264)	Possible historic burial	N	Path 2-Section 1	Crescent Peak	Unevaluated
26CK2951 (CrNV-05-4248)	Historic structure	N	Path 2-Section 1	Crescent Peak	Recommended Ineligible
26CK3023 (CrNV-53-4280)	Rockshelter	Y	Path 2-Section 1	Sloan	Unevaluated
26CK3044	Turned-purple glass scatter	N	Path 2-Section 1	Roach	Unevaluated
26CK3047	Isolated biface fragment	N	Path 2-Section 1	Sloan	Not Significant
26CK3059	Isolated flake	N	Path 2-Section 1	Sloan	Not Significant
26CK3078 (CrNV-05-4246)	Historic structure	N	Path 2-Section 1	Crescent Peak	Recommended Ineligible
26CK3079 (CrNV-05-4247)	Historic structure	N	Path 2-Section 1	Crescent Peak	Recommended Ineligible

TABLE 4-14 PREVIOUSLY RECORDED ARCHAEOLOGICAL SITES WITHIN 1-MILE OF APE - NEVADA					
Site Number	**Description**	**Within APE (Y/N)**	**Project Segment**	**USGS Quadrangle**	**NRHP Eligibility**
26CK3081 (CrNV-05-4249)	Historic dirt road	N	Path 2-Section 1	Crescent Peak	Potentially eligible
26CK3645	Caves with prehistoric artifacts	N	Path 2-Section 1	Crescent Peak	Location not known
26CK3646	Cave with prehistoric artifacts	N	Path 2-Section 1	Crescent Peak	Location not known
26CK4135	Historic ruins	Y	Alternative C	Ivanpah Lake	Destroyed
26CK4406 (CrNV-53-5580)	Isolated flake	N	Alternative B	Sloan SE	Not Significant
26CK4407 (CrNV-53-5581)	Isolated can	N	Alternative B	Sloan SE	Not Significant
26CK4408 (CrNV-53-5582)	Sparse flaked stone scatter	N	Alternative B	Sloan SE	Not Significant
26CK4409 (CrNV-53-5583)	Isolated flake	N	Alternative B	Sloan SE	Not Significant
26CK4410	Secondary flake	N	Alternative B	Sloan SE	Ineligible
26CK4610 (CrNV-53-5567)	Crescent town site and prehistoric village	N	Path 2-Section 1	Stateline Pass	Potentially eligible
26CK4900 (CrNV-53-5890)	Historic trash scatter	N	Proposed	Roach	Not Significant
26CK4949 (CrNV-53-5935)	Historic rock alignment	N	Proposed	Roach	Not Significant
26CK4957/ 36-7694	Transmission line	Y	Crosses Proposed Route in 2 locations	Sloan SE, Roach (for Project)	Determined Eligible
26CK5615 (CrNV-53-5565)	Historic trash scatter	N	Path 2-Section 1	Crescent Peak	Unevaluated
26CK5616 (CrNV-53-5568)	Sparse lithic scatter	N	Path 2-Section 1	Crescent Peak	Unevaluated
26CK5685/ 36-1910	Historic railroad ROW	Y	Proposed	Dry Lake and Apex	Segments outside APE previously determined eligible
26CK7158 (CrNV-53-7528)	Road alignment	N	Proposed	Sloan SE	Unevaluated
26CK7166	Archaeological district	N	Alternative C	Roach/ Stateline Pass	Significant

TABLE 4-15 PREVIOUSLY RECORDED ARCHAEOLOGICAL SITES WITHIN 1-MILE OF APE - CALIFORNIA					
Site Number	**Description**	**Within APE (Y/N)**	**Project Segment**	**USGS Quadrangle**	**NRHP Eligibility**
P2252-1H	Historic graffiti	N	Path 2-Section 3-Alternative 1	Mineral Hill	Unevaluated
P2261-1	Roasting pit	N	Path 2-Section 3-Alternative 1	Mineral Hill	Unevaluated
P2494-1H	Antimony Mine	N	Path 2-Section 3-Alternative 1	Clark Mountain	Unevaluated
P2494-4H	Mine shaft	N	Path 2-Section 3-Alternative 1	Clark Mountain	Unevaluated
P2494-24	Roasting pit	N	Path 2-Section 3-Alternative 1	Clark Mountain	Unevaluated
36-545	Roasting pits	N	Path 2-Section 3-Alternative 1	Clark Mountain	Unevaluated
36-770	Mescal Spring Mine	N	Path 2-Section 3-Alternative 1	Mescal Range	Recommended eligible
36-772	Groaner Spring Trough	N	Path 2-Section 3-Alternative 1	Mescal Range	Unevaluated
36-774	Hardrock Queen Dugouts	N	Path 2-Section 3-Alternative 1	Mescal Range	Unevaluated
36-775	Hardrock Queen Spring	N	Path 2-Section 3-Alternative 1	Mescal Range	Unevaluated
36-785	Historic Wheaton Wash Foundation	N	Path 2-Section 3-Alternative 1	Mescal Range	Unevaluated
36-789	Sparse lithic scatter	N	Path 2-Section 3-Alternative 1	Mineral Hill	Recommended Eligible
36-790	Fire affected rock	N	Path 2-Section 3-Alternatives 1 and 2	Ivanpah Lake	Unevaluated
36-807	Roasting pits	N	Path 2-Section 3-Alternative 1	Clark Mountain	Unevaluated
36-808	Roasting pit	N	Path 2-Section 3-Alternative 1	Clark Mountain	Unevaluated
36-809	Roasting pit	N	Path 2-Section 3-Alternative 1	Clark Mountain	Unevaluated
36-812	Roasting pits, sherds	N	Path 2-Section 3-Alternative 1	Clark Mountain	Unevaluated
36-813	Roasting pits	N	Path 2-Section 3-Alternative 1	Clark Mountain	Unevaluated
36-814	Roasting pit	N	Path 2-Section 3-Alternative 1	Clark Mountain	Unevaluated
36-822	Roasting pits	N	Path 2-Section 3-Alternative 1	Clark Mountain	Unevaluated
36-831 (SBCM-2948)	Roasting pits	N	Path 2-Section 3-Alternative 1	Clark Mountain	Unevaluated
36-834	Agave roasting pit	N	Path 2-Section 3-Alternative 1	Mescal Range	Unevaluated

TABLE 4-15 PREVIOUSLY RECORDED ARCHAEOLOGICAL SITES WITHIN 1-MILE OF APE - CALIFORNIA					
Site Number	**Description**	**Within APE (Y/N)**	**Project Segment**	**USGS Quadrangle**	**NRHP Eligibility**
36-840	Rockshelter	N	Alternative C	State Line Pass	Unevaluated
36-844	Rockshelter	N	Path 2-Section 1	Crescent Peak	Unevaluated
36-855 (SBCM-2264)	Rockshelter	N	Path 2-Section 3-Alternative 1	Clark Mountain	Unevaluated
36-867	Roasting pits	N	Path 2-Section 3-Alternative 1	Clark Mountain	Unevaluated
36-1910/ 26CK5685	Historic railroad	Y	Alternative D; Path 2-Section 2: Path 2-Section 3-Alternatives 1 and 2	Nipton, Desert, Roach	Segments outside APE previously determined eligible
36-2241 (SBCM-2265)	Roasting pits with associated artifact scatter	N	Path 2-Section 3-Alternative 1	Mineral Hill	Unevaluated
36-2242 (SBCM-2266)	Roasting pit	N	Path 2-Section 3-Alternative 1	Mescal Range	Unevaluated
36-2243	Roasting pit	N	Path 2-Section 3-Alternative 1	Mescal Range	Unevaluated
36-2392	Roasting pit and lithics	Y	Path 2-Section 3-Alternative 1	Mescal Range	Unevaluated
36-2393	Roasting pit and lithics	N	Lay Down Area #9: Path 2-Section 3-Alternative 2	Roach	Unevaluated
36-2732	Possible historic burial/prehistoric food processing	N	Path 2-Section 3-Alternatives 1 and 2	Ivanpah Lake	Unevaluated
36-2840	Prehistoric ceramic scatter	N	Path 2-Section 3-Alternative 1	Mescal Range	Unevaluated
36-2985 (SBCM-4354)	Roasting pit	N	Path 2-Section 3-Alternative 1	Mescal Range	Unevaluated
36-2988 (SBCM-4357)	Roasting pits	N	Path 2-Section 3-Alternative 1	Clark Mountain	Unevaluated
36-3012	Ground and flaked stone scatter	N	Path 2-Section 3-Alternatives 1 and 2	Nipton	Unevaluated
36-3016	fire-affected rock	N	Path 2-Section 3-Alternatives 1 and 2	Ivanpah Lake	Unevaluated

TABLE 4-15 PREVIOUSLY RECORDED ARCHAEOLOGICAL SITES WITHIN 1-MILE OF APE - CALIFORNIA					
Site Number	**Description**	**Within APE (Y/N)**	**Project Segment**	**USGS Quadrangle**	**NRHP Eligibility**
36-3048	Historic road	Y	Proposed, Alternative C, Path 2-Section 3-Alternatives 1 and 2 Path 2-Section 3-Alternative 2	Mineral Hill/Ivanpah Lake	Unevaluated
36-3066	Town Of Nipton	Y	Path 2-Section 2	Ivanpah Lake	Unevaluated
36-3727 (CA-069-153)	Flaked stone scatter	N	Alternative C	Ivanpah Lake	Significant
36-4177	Lithic scatter	N	Path 2-Section 3-Alternatives 1 and 2	Ivanpah Lake	Unevaluated
36-4693	Ground stone scatter	N	Proposed	Ivanpah Lake	Unevaluated
36-4694	Flaked and ground stone scatter	N	Proposed	Ivanpah Lake	Unevaluated
36-4701	Historic structure	N	Path 2-Section 3-Alternative 1	Clark Mountain	Unevaluated
36-5439	Ground stone, fire affected rock	N	Path 2-Section 3-Alternative 2	Ivanpah Lake	Unevaluated
36-5440	Artifact scatter	N	Path 2-Section 3-Alternative 2	Ivanpah Lake	Unevaluated
36-6014	Roasting pit	N	Path 2-Section 3-Alternative 1	Mescal Range	Unevaluated
36-6592	Historic refuse	N	Alternative C	Ivanpah Lake	Unevaluated
36-6835	Von Schmidt line (State Historic Landmark #859)	Y	Multiple	Crescent Peak, Ivanpah Lake	CRHR eligible based on SHL number greater than 770
36-6955	Lithic scatter	N	Alternative C	Ivanpah Lake	Unevaluated
36-7098	Lithic scatter, rock feature; historic trash	N	Alternative C	Ivanpah Lake	Unevaluated
36-7347	Historic road	Y	Path 2-Section 3-Alternative 1	Ivanpah Lake	Unevaluated
36-7348	Sparse flaked stone scatter	N	Path 2-Section 3-Alternative 1	Clark Mountain	Unevaluated
36-7392	Sherd and ground stone scatter	N	Path 2-Section 3-Alternative 1	Clark Mountain	Unevaluated
36-7689	Unpaved roadway (Arrowhead Trail Highway)	Y	Proposed, Alternative C, Path 2-Section 3-Alternative 2	Ivanpah Lake	Unevaluated

TABLE 4-15 PREVIOUSLY RECORDED ARCHAEOLOGICAL SITES WITHIN 1-MILE OF APE - CALIFORNIA					
Site Number	**Description**	**Within APE (Y/N)**	**Project Segment**	**USGS Quadrangle**	**NRHP Eligibility**
36-7694/ 26CK4957	Transmission line	Y	Crosses Proposed Route in 2 locations	Sloan SE, Roach (for Project)	Determined Eligible
36-7800	Historic refuse	N	Path 2-Section 3-Alternatives 1 and 2	Mineral Hill	Unevaluated
36-7801	Historic habitation	N	Path 2-Section 3-Alternatives 1 and 2	Mineral Hill	Unevaluated
36-7802	Historic roadside refuse	Y	Path 2-Section 3-Alternatives 1 and 2	Mineral Hill	Unevaluated
36-7803	Multi-component site	N	Path 2-Section 3-Alternative 1	Mescal Range	Unevaluated
36-7804	Mining claim	N	Path 2-Section 3-Alternative 1	Mescal Range	Unevaluated
36-7805	Historic refuse	N	Path 2-Section 3-Alternative 1	Mescal Range	Unevaluated
36-7806	Lithic and ceramic scatter	N	Path 2-Section 3-Alternative 1	Mescal Range	Unevaluated
36-7807	Sparse lithic scatter	N	Path 2-Section 3-Alternative 1	Mescal Range	Unevaluated
36-7808	Sparse lithic scatter	N	Path 2-Section 3-Alternative 1	Mescal Range	Unevaluated
36-7809	Sparse lithic scatter	N	Path 2-Section 3-Alternative 1	Mescal Range	Unevaluated
36-7810	Multi-component site	N	Path 2-Section 3-Alternative 1	Mescal Range	Unevaluated
36-7811	Birthday Mine Complex	N	Path 2-Section 3-Alternative 1	Mescal Range	Unevaluated
36-7812	Historic foundations	N	Path 2-Section 3-Alternative 1	Mescal Range	Unevaluated
36-7813	Sulphide Queen Mine	N	Path 2-Section 3-Alternative 1	Mescal Range	Unevaluated
36-9739	Historic camp	N	Path 2-Section 3-Alternative 1	Mineral Hill	Unevaluated
36-9740	Historic refuse	N	Path 2-Section 3-Alternative 1	Mineral Hill	Unevaluated
36-9755	Lithic scatter	N	Path 2-Section 3-Alternatives 1 and 2	Nipton	Recommende d eligible
36-9759	Multi-component site	N	Path 2-Section 3-Alternatives 1 and 2	Ivanpah Lake	Recommende d Significant
36-9760	Lithic, ground stone, and far scatter	N	Path 2-Section 3-Alternatives 1 and 2	Ivanpah Lake	Recommende d for further testing

TABLE 4-15 PREVIOUSLY RECORDED ARCHAEOLOGICAL SITES WITHIN 1-MILE OF APE - CALIFORNIA					
Site Number	**Description**	**Within APE (Y/N)**	**Project Segment**	**USGS Quadrangle**	**NRHP Eligibility**
36-9761	Sparse lithic scatter	N	Path 2-Section 3-Alternatives 1 and 2	Nipton	Recommended eligible
36-9766	Sparse lithic scatter	N	Path 2-Section 3-Alternatives 1 and 2	Mineral Hill	Recommended eligible
36-9767	Sparse lithic scatter	N	Path 2-Section 3-Alternatives 1 and 2	Mineral Hill	Recommended for further testing
36-9964	Large, diffuse artifact scatter	N	Path 2-Section 3-Alternatives 1 and 2	Mineral Hill	Recommended eligible
36-9965	Sparse flaked and ground stone scatter	N	Path 2-Section 3-Alternatives 1 and 2	Ivanpah Lake	Recommended eligible
36-9966	Lithic, ground stone, and far scatter	N	Path 2-Section 3-Alternatives 1 and 2	Ivanpah Lake	Recommended eligible
36-10315 (PSBR-38H)	Transmission line	Y	Proposed	Multiple	Determined Eligible
36-10802	Barnwell Stage Road	N	Path 2-Section 3-Alternative 2	Mineral Hill	Unevaluated
36-10803	Historic ranch	N	Path 2-Section 3-Alternative 2	Ivanpah Lake	Unevaluated
36-10804	Remains of Lakeview Service Station	N	Path 2-Section 3-Alternative 2	Mineral Hill	Unevaluated
36-10805	Mining claim	N	Path 2-Section 3-Alternative 2	Mineral Hill	Unevaluated
36-10806	Segment of the Ivanpah-Providence Road	N	Path 2-Section 3-Alternative 2	Ivanpah Lake	Unevaluated
36-10873	Roadside refuse	Y	Path 2-Section 3-Alternative 1	Mineral Hill	Unevaluated
36-12129 (CA-SBR-12130H)	Trash scatter	N	Path 2-Section 3-Alternative 1	Mineral Hill	Unevaluated
36-13416 (CA-SBR-12574H)	Historic road/ telegraph line for 36-10315	Y	Path 2-Section 3-Alternative 2	Ivanpah Lake	Unevaluated
36-13417 (SBR-12575H)	Historic road	Y	Proposed; Path 2-Section 3-Alternative 1	Ivanpah Lake	Unevaluated
SBCM2259	Yucca roasting pits	N	Path 2-Section 3-Alternative 1	Clark Mountain	Unevaluated

Three of the 16 previously recorded cultural resources within the APE are prehistoric and consist of 1 lithic scatter (26CK2633), 1 lithic scatter with rock feature (36-2392), and 1 rockshelter (26CK3023). Thirteen of the 16 resources are from the historic period and consist of 1 railroad track (36-1910/26CK5685), 4 road segments (36-3048, 36-7347, 36-7689, and 36-13417), 1 road with remnant communication line (36-13416), 1 structure foundation (26CK4135), 2 trash scatters (36-7802 and 36-10873), 2 transmission lines (36-7694/26CK4957 and 36-10315), 1 town site (36-3066), and 1 survey line (36-6835).

Chambers Group conducted an intensive archaeological field survey of the 200-foot-wide APE for the Transmission Line following the Proposed Route and Alternative Routes A through E (Appendix M). At all existing and planned line crossings the survey width was doubled. Where the lines are planned to turn greater than 30 degrees, an additional 500 feet was surveyed beyond the last structure in both directions to assess areas for line-pulling equipment where there may be potential ground disturbance associated with construction activities. Chambers Group also conducted an intensive archaeological field survey of the 50-foot-wide APE of the proposed telecommunication system route (Path 2-Section 2; Path 3-Section 3-Alternates 1 and 2 (overlap); Path 2-Section 3A; Path 2-Section 3-Alternate 1; and Path 2-Section 3-Alternate 2. The APE was determined in consultation with the project proponent and the Bureau of Land Management. In addition to these corridors, Chambers Group also conducted area surveys at 10 tower locations on the Eldorado-Lugo 500kV transmission line where fiber optic cable may be pulled for Path 2-Section 1. A proposed microwave site was also surveyed at the end of Path 2-Section 3A. Finally, seven laydown areas (Laydown Areas 1 through 7) and one batch plant location were surveyed for cultural resources.

During the field survey, systematic pedestrian transects, spaced at intervals of 15 to 25 meters (roughly 50 to 80 feet), were used in all accessible areas. The survey team closely examined the ground surface for evidence of prehistoric and historic resources. Attention was also paid to any rock surfaces that had potential for rock art. An archaeological site was defined in accordance with the Office of Historical Preservation Bulletin 1989 as consisting "… of at least three associated artifacts or a single feature." Cultural resources not meeting the site criteria were recorded as isolated finds. Cultural resources located during the survey were recorded using Department of Parks and Recreation (DPR) 523 Forms in California and Intermountain Antiquities Computer System (IMACS) site records or Nevada Short Forms in Nevada. Resource locations were recorded using a hand-held GPS unit. Furthermore, the field project was a non-collection survey where recorded artifacts and/or features were left *in situ* after they were documented. During the survey, however, one isolated artifact (36-014499) was collected since it was SCE-owned equipment that was temporally diagnostic and intact. This isolated find is currently being curated at the SCE General Office in Rosemead.

The Project APE contains 21 cultural resources made up of 3 prehistoric archaeological sites (26CK2633, 26CK3023, and 36-2392), 7 historic archaeological sites (26CK4135, 36-7802, 36-10873, 36-014497, 36-014498, 36-014987, and 36-014988), and 11 historic period structures and facilities (36-1910/26CK5685, 36-3048, 36-3066, 36-6835, 36-7347, 36-7689, 36-7694/26CK4957, 36-10315, 36-13416, 36-13417, and 36-014496), as well as 18 isolated finds. Sixteen of the resources are previously recorded and five are newly recorded historic period resources (36-014496, 36-014497, 36-014498, 36-014987, and 36-014988). Of the 16 previously recorded sites, one prehistoric archaeological site (36-2392) was not relocated and one historic trash scatter (36-10873) was not accessible. The archaeological sites, structures and facilities, and isolated finds that are located along each route, alternative, path, or section, are summarized in Table 4-16 and are described in the following sections. The isolated finds, which have no potential to be eligible resources, are not described.

TABLE 4-16
CULTURAL RESOURCES IN THE PROJECT APE

Primary/ IMAC No.	Tri-nomial	Field No.	Resource Type	Site/ Isolate	Pre-historic/ Historic	Project Segment	Quad	Comments
36-014496	SBR-12980H	EITP 1	Road	Site	Historic	Path 2-Section 2; Path 2-Section 3-Alternatives 1 and 2	Nipton	Nipton Road
36-014497	SBR-12981H	EITP 2	Trash Scatter	Site	Historic	Path 2-Section 3-Alternative 1	Mineral Hill	Roadside debris
36-014498	SBR-12982H	EITP 3	Trash Scatter	Site	Historic	Path 2-Section 3-Alternative 1	Mineral Hill	Roadside debris
36-014499	NA	Isolate 1	Ceramic	Isolate	Historic	Proposed	Ivanpah Lake	Ceramic insulator
36-014500	NA	Isolate 2	Can	Isolate	Historic	Alternative C	Ivanpah Lake	Solder sealed can
36-014501	NA	Isolate 3	Survey Marker	Isolate	Historic	Alternative C	Ivanpah Lake	U.S. Coast & Geodetic Survey monument, 1935
NA	NA	Isolate 4	Survey Marker	Isolate	Historic	Alternative C	Ivanpah Lake	G.L.O. Survey monument, 1922
NA	NA	Isolate 5	Survey Marker	Isolate	Historic	Proposed	Desert	U.S. Coast & Geodetic Survey monument, 1927
NA	NA	Isolate 6	Hunting	Isolate	Historic	Proposed	Roach	Steel animal traps
NA	NA	Isolate 7	Lithic	Isolate	Prehistoric	Proposed	Roach	Brown chert flake
NA	NA	Isolate 8	Lithic	Isolate	Prehistoric	Proposed	Roach	Unidirectional quartzite core w/ 7 flake scars
NA	NA	Isolate 9	Survey Marker	Isolate	Historic	Proposed	McCullough Pass	USGS Survey monument - Borax, 1958
NA	NA	Isolate 10	Lithic	Isolate	Prehistoric	Proposed	Sloan SE	Tested chalcedony nodule
NA	NA	Isolate 11	Survey Marker	Isolate	Historic	Proposed	Sloan SE	U.S. Cadastral survey monument, 1958
NA	NA	Isolate 12	Lithic	Isolate	Prehistoric	Alternative B	Boulder City SW	Chert secondary flake
NA	NA	Isolate 13	Can	Isolate	Historic	Alternative D	Desert	Partial Can remains consisting of soldered side seam and bottom cap showing solder dot
NA	NA	Isolate 14	Glass	Isolate	Historic	Path 2-Section 2	Crescent Peak	Sun-colored amethyst glass fragment
NA	NA	Isolate 15	Cans	Isolate	Historic	Path 2-Section 2	Crescent Peak	2 cans

TABLE 4-16 CULTURAL RESOURCES IN THE PROJECT APE								
Primary/ IMAC No.	**Tri-nomial**	**Field No.**	**Resource Type**	**Site/ Isolate**	**Pre-historic/ Historic**	**Project Segment**	**Quad**	**Comments**
NA	NA	Isolate 16	Can	Isolate	Historic	Path 2-Section 2	Crescent Peak	Can with folded edging and solder dot
36-014502	NA	Isolate 17	Glass	Isolate	Historic	Path 2-Section 2	Crescent Peak	2 fragments of sun-colored amethyst glass
36-014503	NA	Isolate 18	Can	Isolate	Historic	Path 2-Section 3-Alternatives 1 and 2	Nipton	Seam-soldered can
26CK2633	NA	NA	Lithic Scatter	Site	Prehistoric	Proposed	Roach	1 projectile point, 1 basalt biface fragment, 2 chert flakes, 1 basalt flake, 1 rhyolite flake and 1obsidian flake: 13 additional flaked stone artifacts found; including two biface fragments
26CK3023	CRNV-53-4280	NA	Rock shelter	Site	Prehistoric	Proposed	Hidden Valley	Metate fragments, potsherds and chert flakes and a single petroglyph
26CK4135	NA	NA	Structure	Site	Historic	Laydown Area # 5	Ivanpah Lake	Demolished historic structure constructed of a late-dating adobe and cement aggregate compound
36-1910/ 26CK5685	CA-SBR-1910H	NA	Railroad	Site	Historic	Proposed; Path 2-Section 3-Alternatives 1 and 2	Roach Desert	UPRR; No change in site condition
36-2392	CA-SBR-2392	NA	Rock Feature	Site	Prehistoric	Path 2-Section 3-Alternative 2; Batch Plant	Ivanpah Lake	2-meter diameter roasting pit; Destroyed by excavation of gravel pit; Updated site form
36-3048	CA-SBR-3048H	NA	Road/Trash	Site	Historic	Proposed; Alternative C; Path 2-Section 3-Alternatives 1 and 2	Ivanpah Lake, Mineral Hill	Old Traction Road and an associated refuse scatter
36-3066	CA-SBR-3066H	NA	Town	Site	Historic	Path 2-Section 3-Alternatives 1 and 2;	Nipton	Town of Nipton; No change

TABLE 4-16 CULTURAL RESOURCES IN THE PROJECT APE								
Primary/ IMAC No.	**Tri-nomial**	**Field No.**	**Resource Type**	**Site/ Isolate**	**Pre-historic/ Historic**	**Project Segment**	**Quad**	**Comments**
						Path 2-Section 2		
36-6835	CA-SBR-6835H	NA	Survey Line	Site	Historic	Proposed; Alternative C; Alternative D; Path 2-Section 2	Crescent Peak, Desert, Stateline Pass	Von Schmidt Survey Line
36-7347	CA-SBR-7347H	NA	Road	Site	Historic	Path 2-Section 3-Alternative 1	Ivanpah Lake, Clark Mtn	Two-Track; No change
36-7689	CA-SBR-7689H	NA	Road and Artifacts	Site	Historic	Proposed; Alternative C; Path 2-Section 3-Alternative 2	Ivanpah Lake	Arrowhead Trail Highway
36-7694/ 26CK4957	CA-SBR-7694H	NA	Utility Line	Site	Historic	Crosses Proposed Route in 2 locations	Ivanpah Lake, Desert, Roach, McCullough Pass, Hidden Valley, Sloan SE, Boulder City SW	LADWP Boulder Transmission Lines 1, 2, and 3
36-7802	CA-SBR-7802H	NA	Trash Scatter	Site	Historic	Path 2-Section 3-Alternatives 1 and 2	Mineral Hill	Highly disturbed
36-10315	CA-SBR-10315H	EITP Site 4	Utility Line	Site	Historic	Proposed	Clark Mtn, Ivanpah Lake, Desert, Roach, McCullough Pass, Hidden Valley, Sloan SE	Boulder Dam-San Bernardino 132 KV Line
36-10873	CA-SBR-10873H	NA	Trash Scatter	Site	Historic	Path 2-Section 3-Alternative 1	Mineral Hill	Not accessible; Updated site form
36-13416	CA-SBR-12574H	CH-01	Road/Telecom Route	Site	Historic	Path 2-Section 3-Alternative 2	Clark Mtn, Ivanpah Lake, Desert, Roach, McCullough Pass, Hidden Valley, Sloan SE	Historic road/ telegraph line for 36-10315; no change in condition; not visible during current survey

TABLE 4-16 CULTURAL RESOURCES IN THE PROJECT APE								
Primary/ IMAC No.	**Tri-nomial**	**Field No.**	**Resource Type**	**Site/ Isolate**	**Pre-historic/ Historic**	**Project Segment**	**Quad**	**Comments**
36-13417	CA-SBR-12575H	CH-02	Road	Site	Historic	Proposed; Path 2-Section 3-Alternative 1	Ivanpah Lake	Two-track; No change in site condition
36-014987	CA-SBR-13132 H	MW-1	Trash scatter	Site	Historic	Path 2-Section 3A	Nipton	Surface scatter of cans and bottles
36-014988	CA-SBR-13133 H	MW-2	Trash scatter	Site	Historic	Path 2-Section 3A	Nipton	Surface scatter of bottle glass, ceramics, and metal

Transmission Line Proposed Route

<u>26CK2633 (CrNV-05-659)</u> - Located on a low hill, this site contains a lithic scatter set against a boulder outcropping. The surface of the area is covered in gravel resembling desert pavement but lacking desert varnish. The previous site record indicates that 1 projectile point, 1 basalt biface fragment, 2 chert flakes, 1 basalt flake, 1 rhyolite flake, and 1 obsidian flake were observed at this site. When the site was revisited 13 additional flaked stone artifacts were found, including two biface fragments. This site has not been evaluated for eligibility and may contain some subsurface deposits.

<u>26CK3023 (CrNV-53-4280)</u> - This is a small east-facing natural rock shelter located in the McCullough Range approximately 1.6 kilometers east and north of McCullough Pass. Metate fragments, potsherds and chert flakes, and a single petroglyph were identified on the previous record submitted by Nickens and Associates in 1982. A subsequent visit to the site yielded a basalt chopper and two flakes. The existing site record recommends the site as eligible for listing on the NRHP.

<u>36-1910 (26CK5685 in Nevada)</u> - Site 36-1910 is a railway line originally developed by the San Pedro, SP, LA&SL in 1905. The line has also been referred to as The Salt Lake Route, and The Clark Road (named for William Andrews Clark, a mining magnate behind development of the railroad). The line originated in Salt Lake City, Utah and terminated in San Pedro, California. The SP, LA&SL partnered with Union Pacific and utilized some pre-existing track in order to complete the line. Operation of the line was essentially bought out by UPRR in 1921 and has been operated by Union Pacific since. This railway has previously been determined eligible.

<u>36-3048</u> - This is the historic Old Traction Road and an associated refuse scatter. The old road crosses the proposed route near the middle of Ivanpah Lake. The road and associated trash scatter were not observed during the survey of the ROW.

<u>36-6835</u> - This is the original alignment for the California/Nevada State line, or the Von Schmidt Line. Located approximately 0.75 mile from the actual state line, this originated because of a surveying error in 1873. An iron marker denoting the line near Needles is listed as California Historical Landmark (No. 859) and a Nevada State Historical Marker (No. 196). There is no indication of the location of the line in the vicinity of the cable route.

36-7689 (CA-SBR-7689H) - This site is a segment of the Arrowhead Trail Highway (State Route 31), an historic road between Los Angeles and Salt Lake City via Las Vegas. The segment of the line near the project area was documented in 2001 by CalTrans (Swope 2001) and consisted of an associated scatter of historic refuse, prehistoric artifacts, a corrugated metal pipe culvert, and brass cap surveyor's monuments.

36-7694 (CA-SBR-7694H); 26CK4957 in Nevada - The Boulder Transmission Lines 1, 2, and 3 were built by the LADWP between 1933 and 1940. The line was determined eligible for the NRHP in 1994. The proposed route crosses 36-7694/26CK4957 at two locations on the Roach USGS topographic quadrangle north of Primm and just west of Eldorado Substation on the Sloan SE USGS topographic quadrangle. No change in the site condition was noted during the current survey.

36-10315 - This is the Boulder Dam-San Bernardino 132 KV Line, built in the early 1930s. It was recorded in 1988 (Neuenschwander and Miller 1988) and determined to be eligible for NRHP listing in 1993 (Cunkelman 1993). A new IMAC site record was filled out for the portion of the transmission line that overlaps the APE in Nevada and has been given a temporary field number (EITP Site 4) until a Nevada state trinomial is issued.

36-13417 (CA-SBR-12575H) - This site consists of a single two-track road that runs east-west. The road appears to be a route from Yates Well to Ivanpah Springs. The western end of this site was revisited in September, 2008. It appears not to have changed since it was recorded in 2007.

Transmission Line Alternative A

No cultural resources were identified in Alternative A.

Transmission Line Alternative B

No cultural resources were identified in Alternative B.

Transmission Line Alternative C

36-3048 - This is the historic Old Traction Road and an associated refuse scatter. The old road crosses the proposed route near the middle of Ivanpah Lake. The road and associated trash scatter were not observed during the survey of the ROW.

36-6835 - This is the original alignment for the California/Nevada State line, or the Von Schmidt Line. Located approximately 0.75 mile from the actual state line, the Von Schmidt Line originated because of a surveying error in 1873. An iron marker denoting the position of the line near Needles is listed as California Historical Landmark (No. 859) and a Nevada State Historical Marker (No. 196). There is no indication of the location of the line in the vicinity of the cable route. The Von Schmidt monument and line is eligible for the CRHR because all State Historical Landmarks numbered above 770 are automatically eligible for the CRHR. The Von Schmidt monument and line have not been formally evaluated.

36-7689 (CA-SBR-7689H) – This site is a segment of the Arrowhead Trail Highway (State Route 31), a historic road between Los Angeles and Salt Lake City that crossed via Las Vegas. The segment of the line near the project area was documented in 2001 by CalTrans (Swope 2001) and consisted of an associated scatter of historic refuse, prehistoric artifacts, a corrugated metal pipe culvert, and brass cap surveyor's monuments. No change in the site condition was noted during the current survey.

Transmission Line Alternative D

36-6835 - This is the original alignment for the California/Nevada State line, or the Von Schmidt Line. Located approximately 0.75 mile from the actual state line, the Von Schmidt Line originated because of a surveying error in 1873. An iron marker denoting the position of the line near Needles is listed as California Historical Landmark (No. 859) and a Nevada State Historical Marker (No. 196). There is no indication of the location of the line in the vicinity of the cable route. The Von Schmidt monument and line is eligible for the CRHR because all State Historical Landmarks numbered above 770 are automatically eligible for the CRHR. The Von Schmidt monument and line have not been formally evaluated.

Transmission Line Alternative E

No cultural resources were identified in Alternative E.

Laydown Areas 1, 2, 3, 4, 6, and 7

No cultural resources were identified in Laydown Areas 1, 2, 3, 4, 6, and 7.

Laydown Area 5

26CK4135 - Site 26CK4135 is the location of a now-demolished historic structure constructed of a late-dating adobe and cement aggregate compound. Adobe remnants are degraded and visible at the surface level. Material debris is found throughout the immediate area, although it is difficult to determine whether the debris is associated with the structure or with more recent episodes of trash dumping.

Batch Plant Area

36-2392 - Site 36-2392 was recorded in 1975 as a 2-meter-diameter roasting pit. The site location shown on the map accompanying the site record depicts an approximately 60-acre area northeast of the I-15/Yates Well Road Exit. This area is now the location of a gravel pit. If the site was in this location, it has been destroyed.

Ivanpah Substation

No cultural resources were identified at Ivanpah Substation.

El Dorado Substation

No cultural resources were identified at El Dorado Substation.

Telecommunication System Path 2-Section 1

No cultural resources were identified for Telecommunication System Path 2-Section 1.

Telecommunication System Path 2-Section 2

36-3066 - The historic town of Nipton is represented by several standing structures. As of 1981, these included a schoolhouse (1930s), barn and attached buildings (1940s), residence (1940s), residence (1930s), residence (1950s), doctor's house, garage, Nipton Hotel (1904-1910), Iron Rail Bar (prior to 1943), Nipton Mercantile Company (1943), Assay Office/Souvenir Shop, hay barn, generator building, railroad loading dock, and powder magazine. There are other minor buildings including storage buildings, restrooms, and outhouses. There is also a town dump area. The railroad station and an ore mill are no longer extant and are represented by foundations (Smith and Lerch 1981).

36-6835 - This is the original alignment for the California/Nevada State line, or the Von Schmidt Line. Located approximately 0.75 mile from the actual state line, the Von Schmidt Line originated because of a surveying error in 1873. An iron marker denoting the position of the line near Needles is listed as California Historical Landmark (No. 859) and a Nevada State Historical Marker (No. 196). There is no indication of the location of the line in the vicinity of the cable route. The Von Schmidt monument and line is eligible for the CRHR because all State Historical Landmarks numbered above 770 are automatically eligible for the CRHR.

36-014496 - Nipton Road was originally a wagon trail that led from the Colorado River to the Ivanpah Mines during the late ninteenth century. This route is currently a paved two-lane highway running east from Interstate-15 to Interstate-95 at Searchlight, Nevada. It is also known as Highway 164 and the Joshua Tree Highway. It appears on maps as a roadway by 1933. However, it remained unpaved until 1963 when it was first identified as State Route 68. This linear feature no longer retains its historical integrity as a wagon trail.

Telecommunication System Path 2-Section 3A

36-014987 is a historic period roadside dump consisting of a surface scatter of cans and bottles.

36-014988 is a historic period roadside dump consisting of a surface scatter of bottle glass, ceramics, and metal.

Telecommunication System Path 2-Section 3-Alternatives 1 and 2 (overlap)

36-1910 (26CK5685 in Nevada) - Site 36-1910 is railway line originally developed by the San Pedro, SP, LA&SL in 1905. The line has also been referred to as The Salt Lake Route, and The Clark Road (named for William Andrews Clark, a mining magnate behind development of the railroad). The line originated in Salt Lake City, Utah and terminated in San Pedro, California. The SP, LA&SL partnered with UPRR and used some pre-existing track in order to complete the line. Operation of the line was essentially bought out by Union Pacific in 1921 and has been operated by Union Pacific since. This railway has previously been determined eligible.

36-3048 - This is the historic Old Traction Road and an associated refuse scatter. The old road crosses the Path 2-Section 3-Alternatives 1 and 2 at Nipton Road. The road and associated trash scatter were not observed during the survey of this section.

36-3066 - The historic town of Nipton is represented by several standing structures. As of 1981, these included a schoolhouse (1930s), barn and attached buildings (1940s), residence (1940s), residence (1930s), residence (1950s), doctor's house, garage, Nipton Hotel (1904-1910), Iron Rail Bar (prior to 1943), Nipton Mercantile Company (1943), Assay Office/Souvenir Shop, hay barn, generator building, railroad loading dock, and powder magazine. There are other minor buildings including storage buildings, restrooms, and outhouses. There is also a town dump area. The railroad station and an ore mill are no longer extant and are represented by foundations (Smith and Lerch 1981).

36-7802 - This is a historic roadside scatter of household refuse.

Telecommunication System Path 2-Section 3-Alternative 1

36-7347 - This is a historic dirt road that crosses the transmission line from east-to-west. It appears to be unchanged since it was updated in 1993.

36-10873 - This historic refuse scatter was recorded in 2002 by CalTrans personnel. The site is located in the median, between the north- and south-bound lanes of I-15. It was not revisited because it was inaccessible.

36-13417 (CA-SBR-12575H) - This site consists of a single two-track road that runs east-west. The road appears to be a route from Yates Well to Ivanpah Springs. The western end of this site was revisited in September, 2008. It appears not to have changed since it was recorded in 2007.

36-014497 - This site consists of historic trash scatter within a drainage situated between a dirt road and I-15. The ground slopes down towards the northwest at around eight percent. Vegetation is comprised of mesquite and creosote scrub. Ground visibility was excellent. Approximately 75 cans of varying use including coffee cans, beer and soda cans and juice cans were found. Bottles showed makers-marks dating to the late 1940s-early 1950s including Latchford-Marble Glass Co., Glass Containers Corp., and Maywood Glass Co. Assorted automotive materials including a rusted wheel axel, vents and automotive seating are also scattered throughout the site. One teal ceramic sherd was found. The site is likely associated with the highway that preceded nearby I-15 (US-466 and US-91) either as debris thrown from vehicles or with brief episodes of settlement or camp associated with road maintenance or construction activities.

36-014498 - This site is similar to 36-014497 and both sites are situated within the same drainage. 36-014498 consists of a large historic debris scatter of three concentrations located within a drainage between a dirt road and I-15. The site consists of a large scatter of historic cans including food cans, motor oil cans, beer/soda cans and evaporated milk cans. Bottles with visible makers-marks dating to the 1940s to 1950s were also observed. Three whiteware fragments and one teal glazed whiteware fragment were also documented. Automotive or possibly power shovel equipment parts were also identified. Some of the food cans appeared unopened, but burst in the sun. Two intact brown Vicks Va-tron-al bottles were found with standard metal screw tops dating from the 1930s to 1940s. As with 36-014497, the proximity of I-15 suggests that artifacts may be present due to debris tossed by passing motorists or due to brief episodes of settlement or camps associated with road maintenance or construction activities.

Telecommunication System Path 2-Section 3-Alternative 2

36-2392 - Site 36-2392 was recorded in 1975 as a 2-meter diameter roasting pit. The site location shown on the map accompanying the site record depicts an approximately 60-acre area northeast of the I-15/Yates Well Road Exit. This area is now the location of a gravel pit. If the site was in this location, it has been destroyed.

36-7689 (CA-SBR-7689H) - This site is a segment of the Arrowhead Trail Highway (State Route 31), an historic road between Los Angeles and Salt Lake City that crossed via Las Vegas. This road has now been replaced by I-15. A segment of the route near the project area was documented in 2001 by CalTrans (Swope 2001) and consisted of an associated scatter of historic refuse, prehistoric artifacts, a corrugated metal pipe culvert, and brass cap surveyor's monuments. No change in the site condition was noted during the current survey.

36-13416 (CA-SBR-12574H) - This site consists of a remnant telegraph pole line and associated dirt road. The site has the same alignment as the Boulder Dam 132kV transmission line (36-10315) and probably served as a communication line during and after the construction of the utility. All wooden telegraph poles have been felled and wood stumps are still visible along the south side of the dirt access road. The linear feature is dissected in many places by the numerous drainages that run east through the area. During the current survey, the dirt road and pole stumps were not visible where Path 2-Section 3-Alternative 2 crosses the resource. No changes to the site condition were observed since the site was recorded in 2007.

Paleontological Resources

The results of a search of the Regional Paleontologic Locality Inventory (RPLI) at the San Bernardino County Museum indicate that several paleontologic resource localities are recorded within 1.0 mile of the Proposed Eldorado-Ivanpah Transmission Line alignments. The nearest paleontologic resource locality (San Bernardino County Museum [SBCM] 1.2.5) is located on the California-Nevada border approximately 300 feet northwest of the proposed route. This locality yielded indeterminate large mammal bone fragments from sediments mapped (Longwell et al. 1965) as Quaternary alluvium.

Additionally, localities (SBCM 1.2.1 through 1.2.4) located near the proposed route in Sections 35 and 36 of Township 17 North, Range 14 Eeast have produced fossil remains of Tortoise (*Gopherus* sp.), Kangaroo Rat (*Dipodomys* sp.), Wood Rat (*Neotoma* sp.), and other small vertebrates, as well as a partial hackberry seed (*Celtis* sp.) and clasts of tufa from the high stand of Ivanpah Lake. Fossil hackberry seeds are abundant in nearby cave deposits which contain Pleistocene vertebrate faunas (Reynolds et al. 1991). Tufa is common at the top of the sedimentary section at several Pleistocene lakes in San Bernardino County, including Piute Valley and Cadiz. However, it is important to note that none of the localities near Ivanpah Lake has yielded temporally diagnostic fossil remains. For this reason, a Pleistocene age for these faunas can be suggested, but not demonstrated.

4.5.4 Environmental Impacts and Mitigation Measures

4.5.4.1 Cultural Resources

The adverse effect criteria in the regulations implementing Section 106 of the NHPA (36 CFR 800.5) apply to cultural resources within the APE determined eligible for the NRHP on federal land administered by the BLM. Under Section 106, effects on cultural resources on federal land will be adverse if the resources are eligible for the NRHP and if Project construction activities will materially alter the characteristics that made the resource eligible in a manner that will diminish its integrity, including integrity of setting for resources eligible under Criteria A, B, or C.

Significant impacts for cultural resources not on federal land in California are defined by CEQA regulations [CCR Title 14, Section 15064.5(a)]. Under CEQA, impacts on cultural resources not located on federal land in California will be significant if they are eligible for the CRHR and if Project construction activities will materially alter the characteristics that made the resource eligible.

All cultural resources that could be affected by the Project with the exception of the Town of Nipton (36-3066) are on federal land and are subject to Section 106. The town of Nipton is located on private property in California and is subject to CEQA. It is possible that the U.S. BLM could assert jurisdiction over the entire Project, in which case the Town of Nipton would also be subject to the Section 106 process.

Except for a few resources that have previously been determined eligible, most resources in the Project APE have not been evaluated for the NRHP or CRHR. Under Section 106 procedures, all resources in the Project APE (area of potential effect) must be evaluated for NRHP eligibility. However, a multi-state PA will be drafted by the BLM in consultation with the SHPO that will allow a modification of Section 106 procedures for this Project. The PA will stipulate that only those cultural resources located in chosen alignments (alignments selected for construction) will be evaluated for eligibility for the NRHP.

All potentially adverse/significant effects/impacts will occur as a result of construction. Cultural resources impacts from operation and maintenance of the transmission line and associated facilities is considered unlikely but will be better defined during final engineering. Because construction plans have not been completed, the specific locations of impacts from removal of existing towers and transmission lines, construction of new towers and stringing of transmission line, construction of a new substation, grading access roads, and use of pulling stations, splicing stations, construction yards, laydown areas, and batch plants are not known. In addition to impacts from construction resulting in destruction or physical alteration of an eligible resource, impacts to the integrity of setting (sometimes termed visual impacts) of eligible above-ground structures, infrastructure, and facilities in the APE could also result in significant impacts or adverse effects. In the impact analyses that follow, potential impacts to eligible resources could be potentially significant, but the APMs would reduce these impacts to less than significant.

Transmission Line Proposed Route

Impacts

The SP, LA&SL Railroad line 36-1910 (26CK5685 in Nevada) was built in 1905 and is now operated by UPRR. This railway has previously been determined eligible. The segment of the railway in the Project APE may or may not be a contributing element of the eligible railway, depending on integrity. There would be no physical alteration of 36-1910 (26CK5685) from the Project because the Project transmission line will span the railway above ground.

The route of the Old Traction Road (36-3048) crosses the proposed route on the Ivanpah lake bed. No physical evidence of the road was observed where the former road alignment crosses the proposed route. The road has been treated as eligible by BLM but there has been no formal determination of NRHP eligibility. Because there is no physical evidence of the road within the APE, it can be considered as a non-contributing element to overall eligibility of the road. Therefore, construction of the proposed route will have no effect on 36-3048.

The Von Schmidt Line (36-6835) is the original alignment of the California/Nevada State line. The Von Schmidt Line is California State Historical Landmark No. 859. All State Historical Landmarks numbered above 770 are automatically eligible for the CRHR. However, the Von Schmidt Line has no physical manifestation and does not exist on the ground. Therefore, construction of the proposed route will have no effect on 36-6835.

The Boulder Transmission Lines 1, 2, and 3 (36-7694/26CK4957) have been determined eligible for the NRHP. There will be no physical alteration of these transmission lines because they will be avoided by the Project. However, it should be determined whether impacts to the integrity of setting of the Boulder Transmission Lines, as a result of the construction of transmission towers and installation of overhead lines for the Project, would be significant/ adverse.

The Boulder Dam-San Bernardino 132kV Line (36-10315) has been determined eligible for the NRHP. The segment of the transmission line that overlies the proposed route will be removed by the Project. This will result in a significant/adverse impact/effect.

26CK3023 (CrNV-53-4280), a prehistoric archaeological site with a rockshelter, a petroglyph, and prehistoric artifacts, and (26CK2633), a prehistoric lithic scatter with bifaces and flakes, the Arrowhead Trail Highway (36-7689) and associated artifacts, and a dirt road (36-13417) have not been evaluated and could be impacted by the proposed route.

Would the Transmission Line Proposed Route Cause a Substantial Adverse Change in the Significance of a Historical Resource as Defined in §15064.5?

All cultural resources along the proposed route are on federal land and are subject to Section 106 of the NHPA and the PA that will stipulate how Section 106 will be implemented for this Project. Any cultural resources determined eligible for the NRHP under the federal Section 106 process and PA would also be automatically eligible for the CRHR and therefore would be Historical Resources as defined by CEQA.

The Boulder Dam-San Bernardino 132kV Line (36-10315) and the Boulder Transmission Lines 1, 2, and 3 (36-7694/26CK4957) have previously been determined eligible for the NRHP and therefore are CEQA Historical Resources. 36-10315 will be removed during Project construction, resulting in a substantial adverse change (significant impact) to this CEQA Historical Resource. The integrity of the setting of 36-7694/26CK4957 may be changed by construction of the transmission line proposed route. If this change in setting is determined to be significant in a Section 106 Determination of Effect, this would result in a substantial adverse change (significant impact) to this CEQA Historical Resource. APM CR-4b (Historic American Engineering Record [HAER] documentation) will reduce impacts/effects to less than significant.

Two prehistoric archaeological sites (26CK3023 and 26CK2633), the Arrowhead Trail Highway (36-7689) and associated artifacts, and a dirt road (36-13417) have not been evaluated for NRHP or CRHR eligibility. If evaluated as eligible during the Section 106/PA process and if construction of the proposed route would impact them, this would result in a substantial adverse change (significant impact) to these CEQA Historical Resources. Implementation of APM CR-3a and APM CR-3b (evaluate resource significance using NRHP and CRHR eligibility criteria) will allow the BLM to make a determination of eligibility. If eligible, APM CR-4a (archaeological data recovery) and/or APM CR-4b (HAER documentation) will reduce impacts / effects to less than significant.

The NRHP-eligible SP, LA&SL Railroad line 36-1910 (26CK5685 in Nevada) will not be impacted/affected by construction of the proposed route. Implementation of APM CR-2 will ensure that this resource is avoided.

Would the Transmission Line Proposed Route Cause a Substantial Adverse Change in the Significance of an Archaeological Resource Pursuant to §15064.5?

26CK3023, 26CK2633, and the artifacts associated with 36-7689 are archaeological sites. As previously discussed, if evaluated as eligible during the Section 106/PA process and if construction of the proposed route would impact 26CK3023, 26CK2633, and the artifacts associated with 36-7689, this would result in a substantial adverse change (significant impact) to these CEQA Archaeological Resources. Implementation of APM CR-3a and APM CR-3b (evaluate resource significance using NRHP and CRHR eligibility criteria) will allow the BLM to make a determination of eligibility. If eligible, APM CR-4a (archaeological data recovery) and/or APM CR-4b (HAER documentation) will reduce impacts/effects to less than significant.

Would the Transmission Line Proposed Route Disturb any Human Remains, Including Those Interred Outside of Formal Cemeteries?

There are no known cemeteries or burials along the transmission line proposed route. No prehistoric burials are anticipated because burials usually are found only in habitation sites and 26CK2633 is not a habitation site. If unanticipated human remains are encountered during construction, Implementation of APM CR-5 (construction monitoring and Unanticipated Cultural Resources Discovery Plan) and APM CR-6 (procedures for inadvertent discovery of human remains) will reduce impacts to human remains.

<u>Mitigation Measures</u>

No mitigation measures are necessary because the implementation of the APMs will reduce impacts/effects to less than significant.

Transmission Line Alternative A

No cultural resources were identified in Alternative A. Therefore, there will be no impacts or effects to cultural resources if Alternative A is constructed. There will be no substantial adverse changes in a Historical Resource or an archaeological resource as defined in CCR Title 14, Section 15064.5 and there will be no disturbance of human remains.

Transmission Line Alternative B

No cultural resources were identified in Alternative B. Therefore, there will be no impacts or effects to cultural resources if Alternative B is constructed. There will be no substantial adverse changes in a Historical Resource or an archaeological resource as defined in CCR Title 14, Section 15064.5 and there will be no disturbance of human remains.

Transmission Line Alternative C

Impacts

The route of the Old Traction Road (36-3048) crosses the proposed route on the Ivanpah lake bed. No physical evidence of the road was observed where the former road alignment crosses the Alternative C. The road has been treated as eligible by BLM but there has been no formal determination of NRHP eligibility. Because there is no physical evidence of the road within the APE, it can be considered as a non-contributing element to overall eligibility of the road. Therefore, construction of Alternative C will have no effect on 36-3048.

The Von Schmidt Line (36-6835) is the original alignment of the California/Nevada State line. The Von Schmidt Line is California State Historical Landmark No. 859. All State Historical Landmarks numbered above 770 are automatically eligible for the CRHR. However, the Von Schmidt Line has no physical manifestation and does not exist on the ground. Therefore, construction of the proposed route will have no effect on 36-6835.

Material associated with the Arrowhead Trail Highway (36-7689) has not been evaluated and could be impacted by Alternative C.

Would Alternative C Cause a Substantial Adverse Change in the Significance of a Historical Resource as Defined in §15064.5?

All cultural resources along Alternative C are on federal land and are subject to Section 106 of the NHPA and the PA that will stipulate how Section 106 will be implemented for this Project. Any cultural resources determined eligible for the NRHP under the federal Section 106 process and PA would also be automatically eligible for the CRHR and therefore would be Historical Resources as defined by CEQA.

The Arrowhead Trail Highway (36-7689) and associated artifacts, have not been evaluated for NRHP or CRHR eligibility. If evaluated as eligible during the Section 106/PA process and if construction of Alternative C would impact them, this would result in a substantial adverse change (significant impact) to this CEQA Historical Resource. Implementation of APM CR-3a and APM CR-3b (evaluate resource significance using NRHP and CRHR eligibility criteria) will allow the BLM to make a determination of eligibility. If eligible, APM CR-4a (archaeological data recovery) and/or APM CR-4b (HAER documentation for the highway) will reduce impacts/effects to less than significant.

Would Alternative C Cause a Substantial Adverse Change in the Significance of an Archaeological Resource Pursuant to §15064.5?

The artifacts associated with 36-7689 constitute an archaeological site. As previously discussed, if evaluated as eligible during the Section 106/PA process and if construction of Alternative C would impact the artifacts associated with 36-7689, this would result in a substantial adverse change (significant impact) to this CEQA Archaeological Resource. Implementation of APM CR-3a (evaluate resource significance using NRHP and CRHR eligibility criteria) will allow the BLM to make a determination of eligibility. If eligible, APM CR-4a (archaeological data recovery) will reduce impacts/effects to less than significant.

Would Alternative C Disturb any Human Remains, Including Those Interred Outside of Formal Cemeteries?

There are no known cemeteries or burials along Alternative C. No prehistoric burials are anticipated because burials usually are found only in habitation sites and there are no known habitation sites along Alternative C. If unanticipated human remains are encountered during construction, implementation of APM CR-5 (construction monitoring and Unanticipated Cultural Resources Discovery Plan) and APM CR-6 (procedures for inadvertent discovery of human remains) will reduce impacts to human remains.

Mitigation Measure

No mitigation measures are necessary because the implementation of the APMs will reduce impacts/effects to less than significant.

Transmission Line Alternative D

The only cultural resource identified along Alternative D is the Von Schmidt Line (36-6835), the original alignment of the California/Nevada State line. The Von Schmidt Line is California State Historical Landmark No. 859. All State Historical Landmarks numbered above 770 are automatically eligible for the CRHR. However, the Von Schmidt Line has no physical manifestation and does not exist on the ground. Therefore, construction of the proposed route will have no effect on 36-6835. Therefore, there will be no impacts or effects to cultural resources if Alternative D is constructed. There will be no substantial adverse changes in a Historical Resource or an archaeological resource as defined in CCR Title 14, Section 15064.5 and there will be no disturbance of human remains.

Transmission Line Alternative E

No cultural resources were identified in Alternative E. Therefore, there will be no impacts or effects to cultural resources if Alternative E is constructed. There will be no substantial adverse changes in a Historical Resource or an archaeological resource as defined in CCR Title 14, Section 15064.5 and there will be no disturbance of human remains.

Laydown Areas 1, 2, 3, 4, 6, and 7

No cultural resources were identified in Laydown Areas 1, 2, 3, 4, 6, and 7. Therefore, there will be no impacts or effects to cultural resources from use of Laydown Areas 1, 2, 3, 4, 6, and 7. There will be no substantial adverse changes in a Historical Resource or an archaeological resource as defined in CCR Title 14, Section 15064.5 and there will be no disturbance of human remains.

Laydown Area 5

The only cultural resource identified in Laydown Area 5 is site 26CK4135, the location of a demolished historic structure made of an adobe and concrete aggregate mixture. Fragments of this material are found at the former structure location. Site 26CK4135 appears to be ineligible for the NRHP based on lack of integrity.

If 26CK4135 is determined not eligible by the BLM and the SHPO, there will no effect/impact on a cultural resource at this location. There will be no substantial adverse changes in a Historical Resource or an archaeological resource as defined in CCR Title 14, Section 15064.5 and there will be no disturbance of human remains.

Batch Plant Area

Site 36-2392 was a 2-meter diameter roasting pit. It has been destroyed and no longer exists. Therefore, construction in Laydown Area 9 will have no effect on 36-2392. There will be no substantial adverse changes in a Historical Resource or an archaeological resource as defined in CCR Title 14, Section 15064.5 and there will be no disturbance of human remains.

Ivanpah Substation

No cultural resources were identified at Ivanpah Substation. Therefore, there will be no impacts or effects to cultural resources if Ivanpah Substation is constructed. There will be no substantial adverse changes in a Historical Resource or an archaeological resource as defined in CCR Title 14, Section 15064.5 and there will be no disturbance of human remains.

Eldorado Substation

No cultural resources were identified at Eldorado Substation. Therefore, there will be no impacts or effects to cultural resources if Eldorado Substation is constructed. There will be no substantial adverse changes in a Historical Resource or an archaeological resource as defined in CCR Title 14, Section 15064.5 and there will be no disturbance of human remains.

Telecommunication System Path 2-Section 1

Construction of Telecommunication System Path 2-Section 1 will have no impact on cultural resources because the fiber optic cable will be attached to existing transmission line towers. There will be no ground disturbance. There will be no substantial adverse changes in a Historical Resource or an archaeological resource as defined in CCR Title 14, Section 15064.5 and there will be no disturbance of human remains.

Path 2-Section 2

Impacts

The telecommunications line will be installed underground along Path 2-Section 2, requiring ground disturbance.

The Von Schmidt Line (36-6835) is the original alignment of the California/Nevada State line. The Von Schmidt Line is California State Historical Landmark No. 859. All State Historical Landmarks numbered above 770 are automatically eligible for the CRHR. However, the Von Schmidt Line has no physical manifestation and does not exist on the ground. Therefore, construction of the proposed route will have no effect on 36-6835.

Nipton Road (36-014496) was originally a wagon trail that led from the Colorado River to the Ivanpah Mines during the late ninteenth century. This route became a paved two-lane highway in 1963 and therefore no longer retains its historical integrity as a wagon trail. Because of a lack of integrity, 36-014496 appears to be ineligible for the NRHP. If 36-014496 is determined not eligible by the BLM and the SHPO, effects/impacts to it will not be adverse as a result of construction of Path 2-Section 2-Alternative 2.

The historic town of Nipton (36-3066) has not been evaluated. If significant subsurface archaeological deposits are present, they could be impacted by the subsurface trenching proposed to place the telecommunications line underground.

Would Path 2-Section 2 Cause a Substantial Adverse Change in the Significance of a Historical Resource as Defined in §15064.5?

Of the cultural resources along Path 2-Section 2, only the town of Nipton is potentially eligible and could be impacted by the Project. The town of Nipton is on private property and is subject to CEQA only.

If subsurface archaeological deposits more than 50 years old are identified in the town of Nipton, they would constitute an archaeological site. If these deposits are evaluated as eligible under CRHR Criterion 4, and if the telecommunication line is placed underground by trenching, significant subsurface historical archaeological deposits could be impacted. If significant archaeological deposits are impacted, this would result in a substantial adverse change (significant impact) to this CEQA Historical Resource. Implementation of APM CR-3a (evaluate resource significance using NRHP and CRHR eligibility criteria) will allow the CPUC to make a determination of eligibility. If eligible, APM CR-4a (archaeological data recovery) will reduce impacts/effects to less than significant.

Would Path 2-Section 2 Cause a Substantial Adverse Change in the Significance of an Archaeological Resource Pursuant to §15064.5?

If subsurface archaeological deposits more than 50 years old are identified in the town of Nipton, they would constitute an archaeological site. If these deposits are evaluated as eligible under CRHR Criterion 4, and if the telecommunication line is placed underground by trenching, significant subsurface historical archaeological deposits could be impacted. If significant archaeological deposits are impacted, this would result in a substantial adverse change (significant impact) to this CEQA Archaeological Resource. Implementation of APM CR-3a (evaluate resource significance using NRHP and CRHR eligibility criteria) will allow the CPUC to make a determination of eligibility. If eligible, APM CR-4a (archaeological data recovery) will reduce impacts/effects to less than significant.

Would Path 2-Section 2 Disturb any Human Remains, Including Those Interred Outside of Formal Cemeteries?

There are no known cemeteries or burials along Path 2-Section 2. No prehistoric burials are anticipated because burials usually are found only in habitation sites and there are no known habitation sites along Path 2-Section 2. If unanticipated human remains are encountered during construction, implementation of APM CR-5 (construction monitoring and Unanticipated Cultural

Resources Discovery Plan) and APM CR-6 (procedures for inadvertent discovery of human remains) will reduce impacts to human remains.

Mitigation Measures

No mitigation measures are necessary because the implementation of the APMs will reduce impacts/effects to less than significant.

Path 2-Section 3A

Path 2-Section 3A consists of installation of new poles to support the telecommunications line between the town of Nipton and a new microwave tower to be built 0.75 mile north of Nipton. The microwave tower will beam the communications signal through the air to a microwave tower to be built at Ivanpah Substation.

There are two historic archaeological sites (36-014987 and 36-014988) that are roadside dumps. The new poles will be placed to avoid these sites. Therefore there will be no impacts or effects on these sites. There will be no substantial adverse changes in a Historical Resource or an archaeological resource as defined in CCR Title 14, Section 15064.5 and there will be no disturbance of human remains. Implementation of APM CR-2 will ensure that these sites are avoided.

Path 2-Section 3-Alternatives 1 and 2 (overlap)

Impacts

Along Path 2-Section 3-Alternatives 1 and 2 (overlap) the telecommunication line will be attached to existing distribution line poles along Nipton Road from Nipton to one mile west of Nipton. From this point to I-15 (9.0 miles) the telecommunication line will be placed underground along the north side of Nipton Road, resulting in ground disturbance.

The Union Pacific Railroad (36-1910) and the historic town of Nipton (36-3066) are in the portion of the route where the existing distribution line poles will be used. Therefore, 36-1910 and 36-3066 will not be impacted by the Project.

The Old Traction Road (36-3048), Nipton Road (36-014496) and a historic roadside scatter of household refuse (36-7802) are located along the segment of Nipton Road where the telecommunication line will be placed underground and could be impacted by ground disturbance.

The route of the Old Traction Road (36-3048) crosses Path 2-Section 3 at Nipton Road. No physical evidence of the road was observed where the former road alignment crosses the Path 2-Section 3. The road has been treated as eligible by the BLM, but there has been no formal determination of NRHP eligibility. Because there is no physical evidence of the road within the APE, it can be considered as a non-contributing element to overall eligibility of the road. Therefore, construction of Path 2-Section 3 will have no effect on 36-3048.

Nipton Road (36-014496) was originally a wagon trail that led from the Colorado River to the Ivanpah Mines during the late ninteenth century. This route became a paved two-lane highway in 1963 and therefore no longer retains its historical integrity as a wagon trail. Because of a lack of integrity, 36-014496 appears to be ineligible for the NRHP. If 36-014496 is determined not eligible by the BLM and the SHPO, effects/impacts to it will not be adverse as a result of construction of Path 2-Section 3.

The historic roadside scatter of household refuse (36-7802) has not been evaluated. If significant subsurface archaeological deposits are present, they could be impacted by the subsurface trenching proposed to place the telecommunications line underground.

Would Path 2-Section 3-Alternatives 1 and 2 (overlap) Cause a Substantial Adverse Change in the Significance of a Historical Resource as Defined in §15064.5?

The cultural resources that could be impacted by ground disturbance are on federal land and are subject to Section 106 of the NHPA and the PA that will stipulate how Section 106 will be implemented for this Project. If these resources are determined eligible for the NRHP under the federal Section 106 process and PA, they would also be automatically eligible for the CRHR and therefore would be a Historical Resource as defined by CEQA.

The refuse scatter (36-7802) has not been evaluated for NRHP or CRHR eligibility. If evaluated as eligible during the Section 106/PA process and if construction of Path 2-Section 3 would impact it, this would result in a substantial adverse change (significant impact) to this CEQA Historical Resource. Implementation of APM CR-3a (evaluate resource significance using NRHP and CRHR eligibility criteria) will allow the BLM to make a determination of eligibility. If eligible, APM CR-4a (archaeological data recovery) will reduce impacts/effects to less than significant.

The NRHP-eligible SP, LA&SL Railroad line 36-1910 (26CK5685 in Nevada) will not be impacted/affected by construction of the proposed route. Implementation of APM CR-2 will ensure that this resource is avoided.

Would Path 2-Section 3-Alternatives 1 and 2 (overlap) Cause a Substantial Adverse Change in the Significance of an Archaeological Resource Pursuant to §15064.5?

The refuse scatter (36-7802) constitutes an archaeological site. As previously discussed, if evaluated as eligible during the Section 106/PA process and if construction of Path 2-Section 3 would impact 36-7802, this would result in a substantial adverse change (significant impact) to this CEQA Archaeological Resource. Implementation of APM CR-3a (evaluate resource significance using NRHP and CRHR eligibility criteria) will allow the BLM to make a determination of eligibility. If eligible, APM CR-4a (archaeological data recovery) will reduce impacts/effects to less than significant.

Would the Path 2-Section 3-Alternatives 1 and 2 (overlap) Disturb any Human Remains, Including Those Interred Outside of Formal Cemeteries?

There are no known cemeteries or burials along Path 2-Section 3-Alternatives 1 and 2 (overlap). No prehistoric burials are anticipated because burials usually are found only in habitation sites and there are no known prehistoric habitation sites along Path 2-Section 3. If unanticipated human remains are encountered during construction, implementation of APM CR-5 (construction monitoring and Unanticipated Cultural Resources Discovery Plan) and APM CR-6 (procedures for inadvertent discovery of human remains) will reduce impacts to human remains.

<u>Mitigation Measures</u>

No mitigation measures are necessary because the implementation of the APMs will reduce impacts/effects to less than significant.

Path 2-Section 3-Alternative 1

Construction of Telecommunication System Path 2-Section 3-Alternative 1 will have no impact on cultural resources because the telecommunications line will be attached to existing distribution line poles. There will be no ground disturbance. There will be no substantial adverse changes in a Historical Resource or an archaeological resource as defined in CCR Title 14, Section 15064.5 and there will be no disturbance of human remains.

Path 2-Section 3-Alternative 2

The Telecommunication System Path 2-Section 3-Alternative 2 telecommunications line will be attached to existing distribution line poles except in two locations where it will be placed underground: a 1-mile segment northeast of Ivanpah Substation and a short segment along the Primm Golf Course north of Yates Well Road. There will be no ground disturbance where the line will be attached to existing distribution line poles and there are no cultural resources in the segments where ground disturbance will occur for underground installation of the line. Therefore, there will be no substantial adverse changes in a Historical Resource or an archaeological resource as defined in CCR Title 14, Section 15064.5 and there will be no disturbance of human remains.

Summary of Impacts and APMs for Cultural Resources

Table 4-17 provides a summary of the cultural resources that could be impacted/affected by the various transmission line routes and alternatives and the telecommunication system path sections.

TABLE 4-17 CULTURAL RESOURCES POTENTIAL IMPACTS AND APMS TO BE IMPLEMENTED						
Primary/ IMAC No.	**Trinomial**	**Resource Type**	**Pre-historic/ Historic**	**NRHP/CRHR Eligibility Status**	**Resource Could be Impacted/ Affected By**	**APMs**
26CK2633	NA	Lithic Scatter	Prehistoric	Unevaluated	Proposed	CR-3a; CR-4a if eligible and can't be avoided; CR-5, CR-6
26CK3023	CRNV-53-4280	Rock shelter	Prehistoric	Unevaluated	Proposed	CR-3a; CR-4a if eligible and can't be avoided; CR-5, CR-6
36-1910/ 26CK5685	CA-SBR-1910H	Railroad	Historic	Determined eligible based on evaluation of other segments	Proposed; Path 2-Section 3-Alternatives 1 and 2	CR-2a
36-3066	CA-SBR-3066H	Town	Historic	Unevaluated	Path 2-Section 3-Alternatives 1 and 2; Path 2-Section 2	CR-3a; CR-4a if eligible and can't be avoided; CR-5, CR-6
36-7689	CA-SBR-7689H	Road and Artifacts	Historic	Unevaluated	Proposed; Alternative C; Path 2-Section 3-Alternative2	CR-3a, CR-3b; CR-4a, CR4-b if eligible and can't be avoided; CR-5, CR-6
36-7694/ 26CK4957	CA-SBR-7694H	Utility Line	Historic	Determined eligible	Crosses Proposed Route in 2 locations	CR-4b
36-7802	CA-SBR-7802H	Trash Scatter	Historic	Determined eligible	Path 2-Section 3-Alternatives 1 and 2	CR-3a; CR-4a if eligible and can't be avoided
36-10315	CA-SBR-10315H	Utility Line	Historic	Determined eligible	Proposed	CR-4b
36-13417	CA-SBR-12575H	Road	Historic	Unevaluated	Proposed; Path 2-Section 3-Alternative1	CR-3b; CR4-b if eligible and can't be avoided;
36-014987	CA-SBR-13132 H	Trash scatter	Historic	Unevaluated	Path 2-Section 3A	CR-2a, CR-2b, CR-2c
36-014988	CA-SBR-13133 H	Trash scatter	Historic	Unevaluated	Path 2-Section 3A	CR-2a, CR-2b, CR-2c

4.5.4.2 Paleontological Resources

Would the Project directly or indirectly destroy a unique paleontological resource or site or unique geological feature?

The transmission line proposed route has either a high or unknown sensitivity for paleontological resources, except where it crosses the McCullough Mountains. The Transmission Line Alternatives also have high or unknown sensitivity for paleontological resources. The Telecommunication System routes have high or unknown sensitivity for paleontological resources except for the portion of Path 2-Section 3-Alternative 1 north of Interstate 15 where the route crosses the foothills of Clark Mountain. Thus, ground disturbing activities throughout almost the entire project have the potential to impact paleontological resources.

Implementation of APMs Paleo-1, Paleo-2, Paleo-3, Paleo-4, Paleo-5, Paleo-6, Paleo-7, and Paleo-8, would reduce all potential impacts to paleontological resources to a less-than-significant level.

No mitigation measures are necessary because the implementation of the APMs will reduce impacts/effects to less than significant.

4.5.5 Evaluation and Comparison of Proposed and Alternative Transmission and Telecommunications Routes

4.5.5.1 Cultural Resources

Transmission Line Routes There are three possible routes near the El Dorado Substation in Nevada: the proposed route in this area and Alternatives A and B. None of these three routes have cultural resources. Therefore, there is no difference in the potential for these routes to impact cultural resources. None of these routes would affect cultural resources.

There are four possible routes near Primm, Nevada. The proposed route in this area and Alternatives D and E have either no cultural resources or cultural resources that are not eligible (isolates) or will not be impacted (Von Schmidt Line). Alternative C has one cultural resource (Arrowhead Trail Highway, 36-7689) that needs to be evaluated. If 36-7689 is determined eligible, the proposed route and Alternatives D and E would have less potential impact on cultural resources than Alternative C.

Telecommunication Line Routes Path 1 consists of the same analysis as the Transmission Line Routes presented above. There are three possible telecommunication routes associated with Path 2. All three routes contain Sections 1 and 2. Section 3A (Proposed Microwave Route) consists of an additional 0.6-mile linear segment that runs north from Nipton. Route 3A will avoid 36-3066 (Nipton Town) and can avoid two trash scatters (36-014987, 36-014988) that appear ineligible for inclusion in the NRHP. Because Section 3A employs the use of a microwave tower, it has less potential for ground disturbance and, therefore, would have less potential to impact cultural resources than Path 2-Section 3 and its associated alternatives.

4.5.5.2 Paleontological Resources

Transmission Line Routes There are three possible routes near the El Dorado Substation in Nevada: the proposed route in this area and Alternatives A and B. All of these three routes have high or unknown sensitivity for paleontological resources. Therefore, there is no difference in the potential for these routes to impact paleontological resources. All of these routes have the potential to impact paleontological resources.

There are four possible routes near Primm, Nevada. All of these three routes have high or unknown sensitivity for paleontological resources except for a small portion of Alternative C. Therefore, Alternative C has a slightly lower potential to impact paleontological resources.

Telecommunication Line Routes Path 1 consists of the same analysis as the Transmission Line Routes presented above. There are three possible telecommunication routes associated with Path 2. All three routes contain Sections 1 and 2. Section 3A (Proposed Microwave Route) consists of an additional 0.6-mile linear segment that runs north from Nipton. Because Section 3A employs the use of a microwave tower, it has less potential for ground disturbance and, therefore, would have less potential to impact paleontological resources than Path 2-Section 3 and its associated alternatives.

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4.6 GEOLOGY, MINERAL RESOURCES, AND SOILS

4.6.1 Regulatory Setting

Geologic resources and geotechnical hazards are governed primarily by local jurisdictions. The conservation elements and seismic safety elements of city and county general plans contain policies for the protection of geologic features and avoidance of hazards, but do not specifically address transmission line construction projects. Relevant, and potentially relevant, statutes, regulations and policies are discussed below.

4.6.1.1 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, which it has been by both California and Nevada. 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 to life and property from all hazards incident to the occupancy of buildings, structures, or premises. It consists of 35 chapters and other appendices.

Clean Water Act

See Section 4.8.1 (Hydrology and Water Quality) for a description of the CWA. Erosion potential is discussed in this section and erosion control requirements associated with SWPPPs.

4.6.1.2 State

Nevada

The State of Nevada has no statewide building code. All building standards and regulations for structures are deferred to counties and cities, which rely primarily on the IBC.

Mining activities in Nevada are regulated by the NDEP Bureau of Mining Regulation and Reclamation (BMRR), in cooperation with other state, federal, and local agencies under regulations adopted in 1989 (NAC 445A.350 through 445A.447, and 519A.010 through 519A.415). BMRR has regulation, closure, and reclamation branches; its mission is to ensure that mining operations do not degrade Nevada's waters and that land disturbed by mining operations is reclaimed in a manner to ensure productive post-mining use.

Nevada Commission on Mineral Resources, Division of Minerals is a non-regulatory state agency that aids in the promotion and development of Nevada's mineral resources through technical and educational processes, and by providing mining information and assistance to those interested in the mineral resources of Nevada.

California

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 (formerly the Special Studies Zoning Act) regulates development and construction of buildings intended for human occupancy to avoid the hazard of surface fault rupture. While this act does not specifically regulate overhead transmission lines, it does help define areas where fault rupture is most likely to occur. This act groups faults into categories of active, potentially active, and inactive.

The Seismic Hazards Mapping Act (the Act) of 1990 (Public Resources Code, Chapter 7.8, Division 2) directs the California Department of Conservation, Division of Mines and Geology (now called California Geological Survey) to delineate Seismic Hazard Zones. The purpose of the 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.

The California Building Code (CBC) 2007 Edition is based on the 2006 IBC (excluding Appendix Chapter 1) as published by the International Code Council, 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. As the Proposed Project route lies within UBC Seismic Zone 3, provisions for design should follow the requirements of Chapter 16.

The State Mining and Geology Board implement state policy and regulations for the reclamation of mined lands and the conservation of mineral resources. The Surface Mining and Reclamation Act of 1975 (Public Resources Code, Sections 2710-2796) set forth these policies in the CCR, Title 14, Division 2, Chapter 8, Subchapter 1.

4.6.1.3 Local

San Bernardino County, California

Most counties and cities in California have regulations that address geologic, seismic, and soils hazards, and mineral resources. For hazards that could impact construction projects these regulations generally adopt the state building standards, which for California are embodied in the 2007 CBC, and follow the geologic and seismic hazards mapping and investigation protocols discussed above. Projects requiring County approvals are permitted by the San Bernardino County Building and Safety Division. Transmission line construction projects are not specifically addressed.

Clark County, Nevada

Many counties and cities in Nevada regulate development based on the surface geologic and geotechnical conditions and associated hazards found within each jurisdiction. The Building Code of Clark County, Nevada consists of the 2006 IBC with Southern Nevada Amendments

(County Code Chapter 22.04) that regulate residential and commercial construction in Clark County under the Building Services Division of the Development Services Department (Clark County 2008). Transmission line construction projects are not specifically regulated by the County.

4.6.2 Significance Criteria and Approach to Impact Assessment

The significance criteria on which impact determinations are based are listed below. APMs relevant to geology, mineral resources, and soils impacts follow; these are the measures that would be incorporated into the Proposed Project to prevent or minimize potential impacts. Last in this subsection is an explanation of how impacts are assessed. Section 4.6.5 lists and discusses all impacts and corresponding mitigation measures in addition to the APMs identified for the proposed transmission line route, transmission line route Alternatives A through E, Ivanpah Substation, and underground fiber optic conduit locations Path 2-Section 2 and Path 2-Section 3-Alternatives 1 and 2.

4.6.2.1 Significance Criteria

Geologic conditions were evaluated with respect to the impacts the project may have on local geology, as well as the impact that specific geologic hazards may have on the proposed transmission line route, transmission line Alternatives A through E, and underground fiber optic conduit locations Path 2-Section 2 and Path 2-Section 3-Alternatives 1 and 2. The significance criteria are from the California CEQA Checklist guidelines, and were selected after review to determine applicability based on the NEPA process and a search for thresholds of significance developed by local agencies, government codes and ordinances. Impacts of the project on the geologic environment would be considered significant and necessitate the incorporation of additional mitigation if project construction or operation would result in any of the following criteria being met.

Geology (Seismic) and Soils

- Would the Project expose people or structures to adverse effects as a result of rupture of an Alquist-Priolo Earthquake Fault or other substantial known fault?
- Would the Project expose people or structures to adverse effects as a result of seismic ground shaking?
- Would the Project expose people or structures to adverse effects as a result of seismic related ground failure including liquefaction?
- Would the Project expose people or structures to adverse effects as a result of landslides?
- Would the Project result in substantial soil erosion or the loss of topsoil?

- Would the Project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project and potentially result in on-site or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

- Would the Project be located on expansive soil, creating substantial risks to life or property?

- Would the Project have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

Mineral Resources

- Would the Project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

- Would the Project result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

The geology and soils criteria primarily describe hazards that could damage project structures, e.g., strong earthquake shaking, surface fault rupture, liquefaction, landslides, severe erosion, and unstable soils and geologic units. Also evaluated is the potential impact from loss of topsoil and the inability of soils to percolate waste water. Mineral resources impacts relate to loss of availability of mineral resources due to construction and operation of the Proposed Project.

4.6.2.2 Applicant Proposed Measures

APMs are identified by SCE as part of the Project design and are to be incorporated throughout the design, construction, and operational phases of the Proposed Project. Table 4-18 presents the APMs that are relevant to this section. Impact analysis assumes that all APMs will be incorporated for this Project as defined in the table; additional mitigation measures are recommended in Section 4.6.5 if it is determined that APMs do not fully reduce the impacts for which they are presented.

TABLE 4-18
APMs – GEOLOGY, MINERAL RESOURCES, AND SOILS

APM No.	Description
APM GEO-1	Prior to final design of substation facilities and transmission and subtransmission line tower foundations, a combined geotechnical engineering and engineering geology study would be conducted to identify site-specific geologic conditions and potential geologic hazards in sufficient detail to support sound engineering practices.
APM GEO-2	For new substation construction, specific requirements for seismic design would be followed based on the Institute of Electrical and Electronic Engineers' 693 "Recommended Practices for Seismic Design of Substation," which includes probabilistic earthquake hazard analysis. Other project elements would be designed and constructed in accordance with the appropriate industry standards, as well as good engineering and construction practices and methods.
APM GEO-3	Transmission line and substation construction activities would be conducted in accordance with the soil erosion/water quality protection measures to be specified in the Project Construction SWPPP. New access roads would be designed to minimize ground disturbance from grading. They will follow natural ground contours as closely as possible, and include specific features for road drainage. Measures could include water bars, drainage

TABLE 4-18 APMs – GEOLOGY, MINERAL RESOURCES, AND SOILS	
APM No.	**Description**
	dips, side ditches, slope drains, and velocity reducers. Where temporary crossings are constructed, the crossings will be restored and repaired as soon as possible after completion of the discrete action associated with construction of the line in the area.

4.6.2.3 Approach to Impact Assessment

The Proposed Project transmission line, Alternatives A through E, and the telecommunication system underground fiber optic conduit locations (including Path 2-Section 2, Path 2-Section 3-Alternatives 1 and 2, and the microwave tower) are the subject of the environmental analysis in Section 4.6. Each of the Project components requires actions and physical facilities that can impact the geology, mineral resources, and soils of the Project area in the short- and long-term. The impacts of these actions and facilities will be different depending upon the environment found at the location in question. Based on the Project description for each component and the geology, mineral resources, and soils conditions within the Proposed Project area, potential impacts are determined and classified by significance. By incorporating SCE's APMs as a defined part of the Project, potential geology, mineral resources, and soils related Project impacts are minimal. Where a potentially significant impact is identified, mitigation measures are proposed to reduce the impact to an acceptable level. Remaining potentially unmitigated impacts are identified.

4.6.3 Environmental Setting

4.6.3.1 Regional Setting and Approach to Data Collection

Section 4.6.3 presents a discussion of the physiography, geology, fault and seismicity (earthquakes), soils, and mineral resources in the Proposed Project area, followed in Section 4.6.4 by a more specific discussion of each of these issues by segment along the proposed transmission line route, Alternative Routes A through E, and the telecommunication system underground fiber optic conduit locations, including Path 2-Section 2, Path 2-Section 3-Alternatives 1 and 2, and the microwave tower (collectively the Proposed Project area), with discussions subdivided by Nevada and California portions of the Proposed Project area as appropriate.

Data collection for this analysis consisted of: identifying and collecting readily available geology, mineral resource, and soils information from local, state, and federal agency sources; obtaining information from SCE databases; conducting a 2-day field reconnaissance along the Proposed Project Area routes/locations; and reviewing readily available aerial images and topographic maps.

Physiography

The entire Proposed Project lies within the Mojave Desert geomorphic province in the southern Great Basin. A geomorphic province is a naturally defined geologic region with distinct and unique landforms that have developed due to a specific combination of geology units, faults and fault zones, and climate. Mojave Desert geomorphology is characterized by isolated mountain ranges separated by desert plains, many having interior drainage and central playas. Fault trends largely control Mojave Desert topography.

The Nevada portion of the Proposed Project elements considered in this section is within, or proximal to, three large valleys (Eldorado, Jean Lake, and Ivanpah) and three mountain ranges (from east to west: McCullough, Lucy Gray, and Clark; Figure 4.6-1, located in Map Volume).

Within California the proposed transmission line route continues southwest across Ivanpah Lake (lowest elevation approximately 2,605 feet) where it rejoins Alternative C (elevation approximately 2,620) before continuing to the Ivanpah Substation within the alluvial fans sloping east from the Clark Mountain Range (Figure 4.6-1, located in Map Volume). The underground fiber optic conduit locations are near the Ivanpah Substation and approximately 12 miles east-southeast at Nipton.

Geology Units

Geology of the Proposed Project consists of alluvium (sedimentary deposits derived from weathering, erosion, and transport) in the flatter portions of the desert plains and bedrock (some types are termed basement rock due to very old age and location in the lowest part of the geologic section) in the mountains. Alluvium ranges in age from modern (Holocene 0 to 11,000 years) stream deposits to early- to late-Pleistocene (past 11,000 to 1,800,000 years) alluvial fan deposits usually flanking the mountain ranges. Bedrock is Miocene (5.3 to 23 million years ago) volcanic rock and basement rock is Ordovician through Precambrian age (older than 444 million years) metamorphic rocks.

Three geologic maps are considered in the description of the Proposed Project area. The most regional is a composite map combining the 1:250,000 scale Geologic Map of California Kingman sheet (Jennings 1961) and the Geology Map of Nevada (Stewart and Carlson 1978), which provide an overview of the geologic units for each state as summarized in Table 4-19 and shown on Figure 4.6-2 (located in Map Volume).

The following summary discussion in Table 4-19 refers to the units on Figure 4.6-2 (located in Map Volume) and compares the Nevada and California geologic units.

In general the important factors that affect construction in these geologic units are foundation-bearing capacity, slope/excavation stability (unit strength and slope angle), surface stability for roads/pads, excavatability, and chemical reactivity with concrete and steel. Since most of the Proposed Project is within the alluvial formations, and most of the alluvium is younger and intermediate alluvial fan materials, the foundation and excavation stability, the chemical characteristics, and the surface trafficability issues are important.

TABLE 4-19
SUMMARY OF SURFICIAL AND BEDROCK GEOLOGIC UNITS ALONG THE ELDORADO-IVANPAH 220KV TRANSMISSION LINE PROPOSED ROUTE, ALTERNATIVE ROUTES A, B, C, D, AND E, UNDERGROUND FIBER OPTIC CONDUIT ROUTES AND MICROWAVE TOWER, AND ELDORADO AND IVANPAH SUBSTATIONS

Formation or Feature	Age	Description/Comment	Potential Excavation Characteristics[1]
California			
Qal – Alluvium	Quaternary (Holocene and Pleistocene)	Mixture of alluvial, alluvial fan, stream/wash, and talus deposits consisting of poorly to well-consolidated sand, silt, gravel. Older units characterized by covering of desert pavement.	Easy to Moderate
Ql – Quaternary Lake Deposits	Quaternary (Holocene and Pleistocene)	Playa and alluvial flat deposits: Flat-lying deposits of light-gray to light-brown silt, clay, and minor sand; interbedded with and locally overlain by pebble to cobble gravel and sand along margins with active alluvial surfaces. Morphology is very flat to broadly undulate. Mud-cracked surfaces and large desiccation cracks present locally.	Easy
Qc – Pleistocene Non-marine	Quaternary (Pleistocene)	Older alluvial fan deposits.	Moderate to Difficult
Tv – Volcanic Bedrock	Tertiary	Andesite and basalt flows.	Moderate to Difficult
epC – Metamorphic Basement Rock	Earlier pre-Cambrian	Metamorphic rocks consisting of gneiss and schist, and lesser amounts of gneissic granite, pyroxenite, hornblendite, migmatite, pegmatite, and marble.	Moderate to Difficult
Nevada			
Qa – Undivided Surficial Deposits	Quaternary (Holocene and Pleistocene)	Mixture of alluvial and talus deposits consisting of poorly consolidated sand, silt, gravel. Older units characterized by covering of desert pavement.	Easy to Moderate
Qp – Playa Deposits	Quaternary (Holocene and Pleistocene)	Playa and alluvial flat deposits.	Easy
QToa – Older Alluvial Fan Deposits	Quaternary (Pleistocene and Pliocene)	Older alluvial deposits.	Moderate to Difficult
Tba – Volcanic Bedrock	Tertiary (Pliocene-Miocene)	Basalt and andesite flows.	Moderate to Difficult
Xm – Metamorphic Basement Rock	pre-Cambrian	Ancient intrusive and metamorphic rocks (undivided Proterozoic): includes granite, granite gneiss, granitic augen gneiss, and quartz monzonite.	Moderate to Difficult

Sources: California: Jennings 1961; Nevada: Stewart and Carlson 1978.
[1] Excavation characteristics are very generally defined as "easy," "moderate," or "difficult" based on increasing hardness of the rock unit. Excavation characteristic descriptions are general in nature and the actual ease of excavation may vary widely depending on site-specific subsurface conditions. Actual excavation characteristics for each geologic unit may vary widely depending on site-specific subsurface conditions, which must be determined by site-specific geophysical surveys, and geotechnical sampling, testing, and analysis.

Soils Units

The soils within the Proposed Project area are generally reflective of the underlying geologic unit(s). Soil formation depends on the extent of weathering of the unit(s) which is governed by the ground surface slope, the long-term climate, vegetation cover, the degree of human modification, and time. All but a small portion of the Proposed Project is within close proximity to existing transmission lines towers and roads that pass through otherwise undeveloped land. Small portions are proposed to traverse the east or north edges of Primm, Nevada (proposed transmission line route, Alternatives C, D, and E), and along Highway 164 or the UPRR tracks near Nipton. No agricultural and rural residential land is within the Proposed Project construction areas.

A summary of the significant characteristics of the major soil associations traversed by the Eldorado-Ivanpah route segments is presented in Table 4-20 (NRCS 2008). The soil associations are listed in numerical, not geographic, order. There are 19 soil units in Table 4-20 (two are designated as NOTCOM-not mapped/not determined); 14 are in Nevada and 5 are in California. Included in the table are the NRCS soil unit identification number, the soil association name, the description and Unified Soil Classification System (USCS) soil abbreviation (e.g., SM = silty sand), the estimated expansion potential, and the concrete and steel corrosion potential. The NRCS information is generalized data gathered at widely spaced locations and should be considered for planning purposes. This information is not intended to replace actual information from the Project Area soils, including detailed field surveys and laboratory tests. The majority of the soils in Table 4-20 are sand and gravel, rich and excessively drained to well-drained, which reduces erosion potential. In general, the concentration of seasonal runoff leads to concentration of erosion along active desert washes.

TABLE 4-20
SUMMARY OF SOILS UNITS ALONG THE ELDORADO-IVANPAH 220KV TRANSMISSION LINE PROPOSED ROUTE, ALTERNATE ROUTES A, B, C, D, AND E, UNDERGROUND FIBER OPTIC CONDUIT ROUTES AND MICROWAVE TOWER, AND ELDORADO AND IVANPAH SUBSTATIONS

Unit ID	Soil Association	Description/Surface USCS Classification[3]	Shrink/Swell (Expansion) Potential[1]	Corrosion[2]	
				Concrete	Uncoated Steel
California					
3520	Arizo	Alluvium derived from metamorphic and sedimentary rock; slope 2 to 8 percent; more than 80 inches to bedrock; excessively drained; loamy sand, gravelly sand. / SC-SM	L-M	L	H
3650	Weiser	Alluvium parent material derived from limestone and dolomite; slope 2 to 8 percent; more than 80 inches to bedrock; well drained; very gravelly fine sandy loam, extremely gravelly sandy loam; gravelly loam, extremely gravelly sandy loam. / SC-SM	L-M	H	L
3660	Colosseum	Alluvium parent material derived from limestone and dolomite; slope 2 to 4 percent; more than 80 inches to bedrock; somewhat excessively drained; fine sandy loam, gravelly loamy sand, extremely gravelly loamy sand, very gravelly fine sandy loam; gravelly fine sandy loam. / SC-SM	L-M	L	H
4180	Peskah-Arizo	Alluvium parent material derived from volcanic rock; slope 4 to 8 percent; 39 to 60 inches to duripan; well drained; extremely gravelly fine sandy loam, gravelly sandy loam,	L-M	L	H

TABLE 4-20 SUMMARY OF SOILS UNITS ALONG THE ELDORADO-IVANPAH 220KV TRANSMISSION LINE PROPOSED ROUTE, ALTERNATE ROUTES A, B, C, D, AND E, UNDERGROUND FIBER OPTIC CONDUIT ROUTES AND MICROWAVE TOWER, AND ELDORADO AND IVANPAH SUBSTATIONS					
Unit ID	Soil Association	Description/Surface USCS Classification[3]	Shrink/Swell (Expansion) Potential[1]	Corrosion[2]	
				Concrete	Uncoated Steel
		gravelly sandy loam, very gravelly sandy clay loam, stratified very gravelly sandy loam to extremely gravelly coarse sand, cemented material. / SM-GP			
Playa (Nevada 500)	Playa	Lacustrine deposits parent material; slope 0 to 1 percent; very poorly drained; more than 80 inches to bedrock; silty clay loam and clay. / ML-CL	M-H	H	H
NOTCOM	Unmapped	Not Determined	--	--	--
Nevada					
140 and 143	Haleburu	Colluvium and/or residuum weathered from volcanic rock; slope 4 to 15 percent; 4 to 14 inches to bedrock; well drained; extremely gravelly sandy loam and very gravelly sandy loam. / GP-GC	L	L	H
150	Hypoint	Mixed alluvium; slope 0 to 4 percent; more than 80 inches to alluvium; somewhat excessively drained; gravelly sandy loam and stratified sand to very gravelly coarse sand. / SM	L	L	H
313	Weiser-Oldspan-Wechech	Alluvium parent material derived from limestone and dolomite; slope 2 to 8 percent; more than 80 inches to alluvium; well drained; extremely gravelly loam, gravelly loam, extremely gravelly sandy loam; gravelly fine sandy loam, fine sandy loam, loam, stratified extremely gravelly loam to extremely gravelly loamy coarse sand, and stratified extremely gravelly fine sandy loam to extremely gravelly loamy coarse sand. / GC-GM	L-M	L	H
380	Tonopah-Arizo	Alluvium parent material derived from mixed sources; slope 2 to 8 percent; more than 80 inches to bedrock; excessively drained; extremely gravelly sandy loam, very gravelly sandy loam, extremely gravelly sand; very gravelly loamy sand, sand, and stratified very gravelly coarse sand to extremely gravelly sand. / GP-GC	L-M	L	H
391	Tipnat-Bluepoint-Hypoint	Mixed alluvium parent material; slope 0 to 4 percent; more than 80 inches to bedrock; well drained; loamy sand, sandy clay loam, stratified sand to very gravelly sandy clay loam; gravelly loamy sand, stratified sand to very gravelly coarse sand. / SM	L-M	H	H
400	Arizo-Cafetal	Mixed alluvium parent material; slope 2 to 8 percent; more than 80 inches to bedrock; excessively drained; extremely stony sandy loam, stratified very gravelly loamy sand to extremely stony coarse sand; extremely stony loam, very cobbly loam, extremely stony loam, stratified extremely cobbly loam to extremely cobbly loamy sand, extremely cobbly coarse sandy loam. / GC-GM	L-M	L	H
430	Bluepoint-Tipnat-Grapevine	Eolian sands parent material; slope 0 to 2 percent; more than 80 inches to bedrock; somewhat excessively drained; Loamy sand, sandy clay loam, stratified sand to very gravelly sandy clay loam; influenced by some gypsum in mixed alluvium. / SM-SC	L-M	L	H

TABLE 4-20 SUMMARY OF SOILS UNITS ALONG THE ELDORADO-IVANPAH 220KV TRANSMISSION LINE PROPOSED ROUTE, ALTERNATE ROUTES A, B, C, D, AND E, UNDERGROUND FIBER OPTIC CONDUIT ROUTES AND MICROWAVE TOWER, AND ELDORADO AND IVANPAH SUBSTATIONS					
				Corrosion [2]	
Unit ID	Soil Association	Description/Surface USCS Classification[3]	Shrink/Swell (Expansion) Potential [1]	Concrete	Uncoated Steel
450	Arizo	Mixed alluvium parent material; slope 2 to 8 percent; more than 80 inches to bedrock; excessively drained; extremely gravelly coarse sandy loam, stratified very gravelly coarse sand to extremely gravelly sand. / GP-GM	L	H	H
500	Playa	Lacustrine deposits parent material; slope 0 to 1 percent; very poorly drained; more than 80 inches to bedrock; silty clay loam and clay. / ML-CL	M-H	H	H
622	Orwash-Arizo-Lanip	Mixed alluvium parent material derived from granite; slope 2 to 8 percent; somewhat excessively drained; more than 80 inches to bedrock; gravelly sandy loam, stratified loamy sand to very gravelly coarse sand; extremely gravelly coarse sandy loam, stratified very gravelly coarse sand to extremely gravelly sand; gravelly sandy loam, gravelly loam, clay loam. / SM	L	L	H
651	Peskah-Arizo	Alluvium parent material derived from volcanic rock; slope 4 to 8 percent; 39 to 60 inches to duripan; well drained; extremely gravelly fine sandy loam, gravelly sandy loam, gravelly sandy loam, very gravelly sandy clay loam, stratified very gravelly sandy loam to extremely gravelly coarse sand, cemented material. / SM-GP	L-M	L	H
754	Haleburu-Hiddensun	Colluvium and/or residuum weathered from volcanic rock; slope 30 to 75 percent; 4 to 14 inches to bedrock; well drained; extremely stony sandy loam, very gravelly sandy loam; very gravelly fine sandy loam, very cobbly fine sandy loam. / GM	L	L	H
780	Prisonear	Eolian sands over alluvium derived from limestone; slope 2 to 8 percent; well drained; more than 80 inches to bedrock; fine sand, fine sand, gravelly loamy fine sand, very gravelly loamy fine sand, cemented material. / SM	L	L	H
NOTCOM	Unmapped	Not Determined	--	--	--

Source: NRCS 2008; typical profiles and abbreviated descriptions.

[1] Shrink/swell potential (expansion potential) characteristics are very generally defined as “low = L,” “moderate = M,” or “high = H” based on the NCRS Unified Soil Classification of the soil unit. Shrink/swell characteristic descriptions are general in nature and adequate for planning purposes; the actual expansion coefficient for each soil unit may vary widely depending on site-specific subsurface conditions, which must be determined by site-specific geotechnical sampling, testing, and analysis.

[2] Corrosion risks for concrete and uncoated steel are very generally defined as “low = L,” “medium =M,” or “high = H” based on the NCRS classifications for each soil unit. Corrosion characteristic descriptions are general in nature and adequate for planning purposes; the actual corrosion indices for each soil unit may vary widely depending on site-specific subsurface conditions, which must be determined by site-specific geotechnical sampling, testing, and analysis.

[3]USCS Classification list can be found in Table 4-20 in Appendix E.

Faults and Seismicity

Faults

As mentioned above, active (earthquake capable) faults bound the Mojave Desert province; older faults (not active or potentially active) are found exposed and buried under alluvium within and near the Proposed Project area. One active fault (Black Hills) is located just north of the Proposed Project on the eastern flank of the McCullough Mountains projecting toward the proposed transmission line route and possibly Alternatives A and B. A second active fault (the Stateline Fault System or SFS) trending northwest-southeast parallel to the state line just within California crosses the proposed transmission line route and Alternatives C and D. Earthquake activity on distant larger scale active fault zones (e.g., the San Andreas, Garlock, Eastern California Shear Zone, Panamint Valley, Death Valley, Sevier-Toroweap; Figure 4.6-3, located in Map Volume) could produce large magnitude earthquakes that would be felt in the Project Area. Potential earthquake capable faults within close proximity to the Project Area are shown on Figure 4.6-4 (located in Map Volume).

Seismicity

There are few historic/instrumental earthquakes (USGS 2008b) greater than magnitude 3 reported within 50 miles of the central portion of the Project Area (at the north end of the Lucy Gray Mountains). One event of magnitude 6.1 (November 1911) is reported about 40 miles to the southwest north of Baker, California; no specific information was found for this event and its location is considered poor. Approximately 30 to 45 miles to the northeast, four events of magnitude 4.5 to 5.0 occurred just north of Boulder City, Nevada. A cluster of nine magnitude 3.0 to 3.9 events occurred west-northwest of the Project Area on the California side of the border between Pahrump and Mesquite Valleys. At least seven magnitude 3.0 to 3.9 events occurred on a northeast to southwest trend from Boulder City to the north end of Eldorado Lake, likely associated with the active Black Hills Fault.

Fault Rupture

A factor considered in the seismic design of project structures is the location of active faults that may cross a transmission line route or affect a substation or other structures. An estimate of the amount and type of potential surface fault displacement within the Project Area considers the SFS Mesquite segment and the Black Hills Fault (Figure 4.6-4, located in Map Volume). There is substantial uncertainty as to the location of these faults. The Mesquite Fault segment crosses the proposed transmission line route and Alternative Routes C and D along the California-Nevada border at Primm nearly perpendicular to the proposed transmission line route, at a 20- to 70-degree angle to Alternative Route C, and a 60- to 70-degree angle to Alternative Route D. No other faults within the Project Area are known to have a potential for earthquake ground rupture.

Strong Groundshaking

The USGS (2008) provides a uniform estimate of the intensity of earthquake-induced ground motions for the United States based on an up-to-date assessment of potential earthquake faults or other sources. A commonly used benchmark is peak horizontal ground acceleration (PGA) that is provided for probability of occurrence and represented as a fraction of the acceleration of gravity (g), e.g., 0.2g. The approximate estimated range of peak ground acceleration for a 2-percent probability in 50 years in the Project Area for the Project elements discussed herein is shown in column 2 of Table 4-21 below and on Figure 4.6-5 (located in map volume). Considering the peak ground acceleration shaking map for the 7.3 Landers earthquake (CISN 2008), if applied to the Mesquite segment of the SFS (likely a very a conservative assumption) the peak ground accelerations would have been very approximate as shown in column 3 of Table 4-21.

TABLE 4-21
ESTIMATED PEAK HORIZONTAL GROUND ACCELERATION FOR THE PROJECT FACILITIES

Project Facility	Estimate based on 2 Percent in 50 Years Peak Horizontal Ground Acceleration	Estimate based on Magnitude 7.3 Landers 1992 Earthquake
Proposed Transmission Line Route Segments		
Eldorado to McCullough Mountains	0.16 to 0.20g	0.20 to 0.25g
McCullough Mountains	0.15 to 0.16g	0.20 to 0.25g
McCullough Mountains to Ivanpah	0.12 to 0.15g	0.18 to 0.50g
Alternative Transmission Line Routes		
A	0.16 to 0.17g	0.18 to 0.20g
B	0.17 to 0.20g	0.15 to 0.18g
C	0.13g	0.40 to 0.50g
D	0.13g	0.40 to 0.50g
E	0.13g	0.40 to 0.50g
Ivanpah Substation		
Ivanpah Substation	0.13g	0.35g
Telecommunications Underground Fiber Optic Conduit Location Alternatives and Microwave Tower		
Conduit Near Ivanpah Substation	0.13g	0.35g
Conduit East of Nipton	0.12 to 0.13g	0.30 to 0.45g
Conduit West of Nipton	0.12 to 0.14g	0.30 to 0.45g
Microwave Tower	0.12 to 0.13g	0.30 to 0.45g

(1) 2 percent in 50 years (USGS 2008a)
(2) Deterministic values centering the magnitude 7.3 Landers earthquake fault on the Stateline Fault System (CISN 2008)

Liquefaction

Saturated, unconsolidated silts, sands, and silty sands within 50 feet of the ground surface are most susceptible to liquefaction, which can include loss of bearing strength, lateral spreading, subsidence, and buoyancy effects caused when these sediments temporarily lose their shear strength during strong groundshaking. Susceptibility to liquefaction is a function of the sediment density, water content, depth, and the peak ground acceleration. Over most of the Project area liquefaction would be very unlikely due to groundwater depth (generally much greater than 50 feet). Such conditions would be determined by geotechnical investigations as recommended in APM GEO-1 and GEO-5.

Seismic Slope Instability, Seismically-Induced Settlement, Ground Cracking, and Subsidence

Most of the Project area is in low to moderately sloping terrain containing sandy and gravelly alluvium that is not susceptible to landslide effects. About 10 percent of the proposed transmission line route (McCullough Mountains segment) and 20 percent of Alternative Route C pass through areas with moderately steep to very steep topography containing highly weathered and fractured bedrock/basement rock. These areas may be susceptible to rockfall and rotational movement of moderate to large sections of hillslope within or adjacent to the route.

Seismically-induced ground settlement can occur during strong groundshaking in alluvium if deposits have a low relative density and are dynamically compacted thereby reducing volume. Differential settlement can damage structures placed across such susceptible areas.

Earthquake-induced ground cracking may have many causes, but on low to moderate slopes (a few to several degrees) there would be little to no impact expected for transmission line towers with deep foundations. Within the Project area, ground cracking potential exists along the McCullough Mountains segment and the bedrock portion of Alternative Route C.

Subsidence due to groundwater withdrawal is possible due to substantial pumping; however, there are no known records of such conditions in the Project area. Over time, if groundwater withdrawal from the Ivanpah and Eldorado Valleys increases to an overdraft condition, signs of subsidence could be observed. The effects at the onset would likely be measured in inches and not immediately impact the Proposed Project.

Mineral Resources

Non-metallic and metallic mineral deposits occur within the general Project area; however, no mining of metallic deposits was identified within 1,000 feet of the Project components considered herein. Non-metallic deposits within the general Project area include pumice, feldspar, limestone, and sand and gravel, with sand and gravel potential being the highest along the routes. A review of the USGS Mineral Resource Data System (Figure 4.6-6, located in Map Volume) for the Project Area indicates that there are a few past and current mining locations in the vicinity of the Proposed Project, but none located within 1,000 feet of either side of the proposed transmission line route or alternative routes (USGS 2008c).

4.6.3.2 Local Environmental Setting: Eldorado-Ivanpah Transmission Line Proposed Route and Alternatives, Ivanpah Substation, Underground Fiber-Optic Conduit Routes and Microwave Tower

Transmission Line Routes

The Proposed Project transmission line route has been subdivided into three segments based on the geographic conditions along the route. These are:

- Eldorado Substation to the McCullough Mountains (Mileposts 0.0 to 8.7 and Towers 1 through 61)
- McCullough Mountains (Mileposts 8.7 to 12.0 and Towers 62 to 84)
- McCullough Mountains to the Ivanpah Substation (Mileposts 12.0 to 34.5 and Towers 85 through 237)

Alternative Transmission Line Routes A, B, C, D, and E are described, as well as the proposed and alternative fiber optic conduit routes and microwave tower. For each of these portions of the Proposed Project there is a brief discussion of the (a) geology and soils units, (b) faults, seismicity, and other hazards, and (c) mineral resources. The geology units are described based on Schmidt and McMackin (2006; Figure 4.6-7, located in Map Volume) and summarized for the proposed transmission line route in Table 4-22. These geology units in Table 4-19 subdivide the mixed young alluvium (yellow and gray with granitic source rock-“grus”), playa/lake bed (light green), older (and intermediate) alluvium (light brown), and areas of shallow bedrock/basement rock units (light violet). Schmidt and McMackin (2006) subdivide units into more categories to reflect: a) the active wash deposits (Qa), b) young (Qya), older young (Qyao), and intermediate (Qia) alluvial fans, c) active (Qap), young (Qyp), and fringe (Qypf) playa deposits, and d) bedrock materials (Qha). The modifier “e” indicates eolian (wind) deposition and “g” indicates grus (normally a weathering product of granite, but here used to indicate equigranular sandy alluvium derived from granitic source rock with little to no desert pavement formation). The colors in Table 4-22 provide an overall visual sense of the predominance of the various unit ages and types within the Project Transmission Line Route segments.

TABLE 4-22
GEOLOGY UNITS ALONG THE PROPOSED ELDORADO-IVANPAH 220KV TRANSMISSION LINE ROUTE
(per Schmidt and McMackin 2006; see text above for explanation of colors)

Approximate Transmission Line Segment	MP to MP	Geologic Unit / Formation Map Symbol — Percentage of Unit MP to MP			
Eldorado to McCullough Mountains	0.00	Qya	Qyv	Qya+Qaa	Totals*
	2.33	54%	15%	31%	100%
	2.33	Qya	Qya/Qia	Qia+Qya	Totals
	4.32	44%	52%	4%	100%
	4.32	Qya	Qya+Qaa	Qia+Qya	Totals
	6.32	40%	31%	29%	100%
	6.32	Qia	Qya+Qaa	Qia+Qya	Totals
	8.18	36%	24%	40%	100%
	8.18	Qia	Qha/ mr-mv-fpg	Totals	
McCullough Mountains	10.05	13%	87%	100%	
	10.05	Qia+Qya	Qha/ mr-mv-fpg	Totals	
	11.92	5%	95%	100%	

TABLE 4-22
GEOLOGY UNITS ALONG THE PROPOSED ELDORADO-IVANPAH 220KV TRANSMISSION LINE ROUTE
(per Schmidt and McMackin 2006; see text above for explanation of colors)

Approximate Transmission Line Segment	MP to MP	Geologic Unit / Formation Map Symbol / Percentage of Unit MP to MP				
	11.92	Qia	Qyag	Qyag+Qaag	Totals	
McCullough Mountains to Ivanpah Substation	13.91	16%	75%	9%	100%	
	13.91	Qyag	Qyag+Qaag	Totals		
	15.86	98%	2%	100%		
	15.86	Qyag	Qyag+Qaag	Totals		
	17.94	98%	2%	100%		
	17.94	Qyag	Qyag+Qaag	Qyag+Qiag	Qha/ mr-mv-fpg	Totals
	19.87	37%	19%	39%	5%	100%
	19.87	Qyag	Qyag+Qiag	Qye/Qyag	Totals	
	21.64	38%	41%	21%	100%	
	21.64	Qypf	Qyag+Qiag	Totals		
	23.11	44%	56%	100%		
	23.11	Qyae	Qyag+Qaag	Qyag+Qiag	Qyag+Qypf	Totals
	24.59	21%	58%	14%	7%	100%
	24.59	Qyae	Qyag+Qyaog	Totals		
	26.45	77%	23%	100%		
	26.45	Qap	Qypf	Qyag+Qyaog	Totals	
	29	9%	36%	55%	100%	
	29	Qap	Totals			
	30.26	100%	100%			
	30.26	Qap	Qypf+Qapf	Qyag+Qyaog	Qyag+Qyae	Totals
	32.24	35%	15%	29%	21%	100%
	32.24	Qyag	Qyag+Qyaog	Qyao+Qya	Totals	
	34.19	70%	28%	2%	100%	
	34.19	Qya+Qyao	Qyao+Qya	Totals		
	34.56	50%	50%	100%		

*Numbers may not equal 100 due to rounding.

Soil units (Table 4-23) are from the NRCS (2008) website. With regard to the soil units, some portions of the Project Area were designated by the NRCS as NOTCOM for soil mapping "not complete." The NOTCOM areas were mapped approximately for this study using Google aerial images to extend the soil unit contacts already provided on the NRCS maps. All percentages should be considered approximate. Geology unit symbols may include a "slash = /" or a "plus = +" indicating one unit over another or mixed with another.[1]

[1] **Composite symbols:** Quaternary geologic units commonly exist as thin veneers over older units including bedrock. In areas where this relationship is common, the unit symbols shown on the map are separated by a slash (/) indicating the younger, or overlying, unit first (e.g., Qya/Qia indicates young alluvial fans deposits over intermediate alluvial fan deposits). In many areas the

A more detailed description for each of the three segments of the (a) geology and soils units, (b) faults, fault rupture, and seismicity; (c) other geologic, soil, and seismic hazards, and (d) mineral resources is found in Appendix E.

TABLE 4-23
SOILS UNITS ALONG THE PROPOSED
ELDORADO-IVANPAH 220KV TRANSMISSION LINE ROUTE

Transmission Line Segment	MP / MP	NRCS Soil Unit Number / Percentage of Unit MP to MP			
Eldorado to McCullough Mountains	0.00	400	150	Totals*	
	2.33	18%	82%	100%	
	2.33	400	Total		
	4.32	100%	100%		
	4.32	400	450	Totals	
	6.32	22%	78%	100%	
	6.32	400	450	Totals	
	8.18	20%	80%	100%	
	8.18	400	450	Totals	
McCullough Mountains	10.05	39%	61%	100%	
	10.05	754/850	Total		
	11.92	100%	100%		
	11.92	400	622	754/850	Totals
McCullough Mountains to Ivanpah Substation	13.91	83%	14%	3%	100%
	13.91	622	Total		
	15.86	100%	100%		
	15.86	622	Total		
	17.94	100%	100%		
	17.94	622	380	140	Totals
	19.87	31%	65%	4%	100%
	19.87	780	380	Totals	
	21.64	34%	66%	100%	
	21.64	391	780	Totals	
	23.11	22%	78%	100%	
	23.11	380	391	Totals	
	24.59	65%	35%	100%	
	24.59	380	Total		
	26.45	100%	100%		
	26.45	500	391	380	Totals
	29	15%	33%	52%	100%

lateral extent of individual deposits is commonly so small that each deposit cannot be shown at the database map scale (Schmidt and McMakin 2006). Where a plus sign (+) is used the most common deposit is listed first and the lesser deposit (estimated to be 20 percent or less of the area shown) is listed second. For example, Qyag+Qia indicate an area of at least 80 percent Qya and 20 percent or less Qia.

TABLE 4-23
SOILS UNITS ALONG THE PROPOSED ELDORADO-IVANPAH 220KV TRANSMISSION LINE ROUTE

Transmission Line Segment	MP / MP	NRCS Soil Unit Number / Percentage of Unit MP to MP		
	29	500	Totals	
	30.26	100%	100%	
	30.26	500	3520	Totals
	32.24	40%	60%	100%
	32.24	3520	Total	
	34.19	100%	100%	
	34.19	3520	Total	
	34.56	100%	100%	

*Numbers may not equal 100 due to rounding.

Alternative Routes

Alternative routes extend north and south of the Eldorado Substation and around the town of Primm, Nevada (Figure 4.6-1, located in Map Volume). The geology and soils units are presented in Tables 4-24 and 4-25, respectively. A more detailed description for each of the five alternative routes of the (a) geology and soils units; (b) faults, fault rupture, and seismicity; (c) other geologic, soil, and seismic hazards; and (d) mineral resources is found in Appendix E.

TABLE 4-24
GEOLOGY UNITS ALONG THE PROPOSED ELDORADO-IVANPAH 220KV TRANSMISSION LINE ALTERNATIVE ROUTES A, B, C, D, AND E (per Schmidt and McMakin 2006).

Alternative Route	Geologic Unit/Formation Map Symbol / Percentage of Unit within Alternative Route							
Alternative A	Qya+Qaa	Qia+Qya	Totals					
	58%	42%	100%					
Alternative B	Qya	Qyv	Qya+Qaa	Qya/Qia	Totals			
	58%	20%	14%	8%	100%			
Alternative C	Qia	Qya+Qaa	Qia+Qya	Qha/mr-mv-fpg	Qyag+Qypf	Qyag+Qyaog	Qyag+Qyae	Totals
	4%	32%	3%	18%	3%	9%	31%	100%
Alternative D	Qap	Qypf+Qapf	Qyag+Qyaog	Qyag+Qyae	Totals			
	27%	11%	38%	24%	100%			
Alternative E	Qyag+Qyaog	Totals						
	100%	100%						

TABLE 4-25 SOILS UNITS ALONG THE PROPOSED ELDORADO-IVANPAH 220KV TRANSMISSION LINE ROUTE								
Alternative Location	NRCS Soil Unit Number Percentage of Unit by Alternative Route							
Alternative	450	150	Totals					
A	77%	23%	100%					
Alternative	400	150	430	Totals				
B	50%	45%	5%	100%				
Alternative	391	3650	3520	3660	754/850	380	313	Totals
C	5%	3%	34%	24%	16%	10%	8%	100%
Alternative	500	391	380	Totals				
D	24%	19%	57%	100%				
Alternative	380	Totals						
E	100%	100%						

4.6.3.3 Ivanpah Substation

The proposed Ivanpah Substation is located west of Yates Well and I-15 on younger alluvial fans and across young desert washes originating in the Clark Mountain Range on the west. The geology units are presented in Table 4-26 and the soil units in Table 4-27. A more detailed description for the Ivanpah Substation of the (a) geology and soils units; (b) faults, fault rupture, and seismicity; (c) other geologic, soil, and seismic hazards; and (d) mineral resources is found in Appendix E.

TABLE 4-26 GEOLOGY UNITS ALONG THE PROPOSED ELDORADO-IVANPAH 220kV IVANPAH SUBSTATION (per Schmidt and McMakin 2006)			
Substation Site	Geologic Unit / Formation Map Symbol		
	Percentage of Unit at the Substation		
Ivanpah	Qyag	Qya+Qyao	Totals
Substation	80%	20%	100%

TABLE 4-27 SOILS UNITS ALONG THE PROPOSED ELDORADO-IVANPAH 220kV TRANSMISSION LINE ROUTE		
Substation	NRCS Soil Unit Number Percentage of Unit at Substation	
Ivanpah	3520	Totals
Substation	100%	100%

4.6.3.4 Telecommunication System-Underground Fiber Optic Cable Conduit Routes (West and East of Nipton, and North and South of Ivanpah Substation) and Microwave Tower

Underground fiber optic cable will be deployed in conduits in concert with aboveground lines as a part of the telecommunication system designed to afford special protection to the system under specific outage contingencies and to provide operational and monitoring capability Tables 4-28 and 4-29. Underground conduit lines and a microwave tower are considered in this section.

Path 2-Section 3 is from the town of Nipton to the Ivanpah Substation. It has a preferred route (Section 3A-microwave towers) and two alternates (partially underground conduits). Path 2-Section 3-Alternates 1 and 2 share the same route west from the town of Nipton to I-15, with the first mile aboveground and the next 9 miles underground. From the I-15 and Nipton Road junction point, Alternatives 1 and 2 take divergent routes aboveground along existing Nipton 33kV distribution lines to the Ivanpah Substation, except the last mile of each would be underground conduit entering the Ivanpah Substation. Alternative 1 enters from the south and Alternative 2 enters from the north. A 180-foot-tall microwave communication tower would be located approximately 0.4 mile northeast of Nipton and would require an area of approximately 100 feet by 100 feet. An aboveground power distribution line and the aboveground Section 2 fiber optic cable would be extended overland from the town of Nipton to this microwave tower site.

TABLE 4-28
GEOLOGY UNITS ALONG THE PROPOSED ELDORADO-IVANPAH TELECOMMUNICATION FACILITIES (per Schmidt and McMakin 2006; Jennings 1961; Stewart and Carlson 1978)

Buried Conduit or Microwave Tower Site	**Geologic Unit/Formation Map Symbol**		
	Percentage of Unit at the Location		
Conduit East of Nipton	**Qal/Qa**	**Totals**	
	100%	**100%**	
Conduit West of Nipton	**Qal**	**Ql**	**Totals**
	80%	**20%**	**100%**
Conduit North of Ivanpah Substation	**Qyag**	**Qya+Qyao**	**Totals**
	55%	**45%**	**100%**
Conduit South of Ivanpah Substation	**Qyag**	**Qyao+ Qya**	**Totals**
	40%	**60%**	**100%**
Microwave Tower NE of Nipton	**Qyag**	**Qya+Qyao**	**Totals**
	80%	**20%**	**100%**

TABLE 4-29 SOILS UNITS ALONG THE PROPOSED ELDORADO-IVANPAH TELECOMMUNICATION FACILITIES (NRCS 2008)		
Buried Conduit or Microwave Tower Site	**NRCS Soil Unit Number**	
	Percentage of Unit at Location	
Conduit East of	**4180**	**Totals**
Nipton	**100%**	**100%**
Conduit West of	**NOTCOM**	**Totals**
Nipton	**100%**	**100%**
Conduit North of	**3520**	**Totals**
Ivanpah Substation	**100%**	**100%**
Conduit South of	**3520+NOTCOM**	**Totals**
Ivanpah Substation	**100%**	**100%**
Microwave Tower	**4180**	**Totals**
Nipton	**100%**	**100%**

The Path 2-Section 2 underground conduits will connect to Path 2-Section 1 Eldorado-Lugo aboveground lines from the town of Nipton running about 4.8 miles east next to the north side of Nipton Road (Highway 164). A more detailed description for both of the underground conduit locations of the (a) geology and soils units, (b) faults, fault rupture, and seismicity, (c) other geologic, soil, and seismic hazards, and (d) mineral resources is found in Appendix E.

4.6.4 Environmental Impacts and Mitigation Measures

This section presents a summary discussion of potential impacts, and as-needed mitigation measures, for the Proposed Project transmission line route and Alternative Routes A through E, Ivanpah Substation, and proposed telecommunication system underground fiber optic conduit routes and microwave tower for the Eldorado-Ivanpah Project after incorporation of the APMs. The summary discussion addresses Geology [Seismic] and Soils first, then Mineral Resources with subheadings for each of the applicable significance threshold statements identified in Section 4.6.2.1. For each significance threshold subheading there is a discussion organized by construction and operations of the level of potential impact (if any) and applicability of necessary mitigation measures beyond the APMs (if any). By incorporating SCE's APMs as a defined part of the project, potential geology, mineral resources, and soils related project impacts are minimal. Where a potentially significant impact is identified, mitigation measures are proposed to reduce the impact to less than significant wherever possible.

In Appendix E for the Proposed Project elements there is a detailed general discussion under each significance threshold that applies to all elements and then, as appropriate, discussions of conditions unique to an element (e.g., route, segment, substation) or some smaller portion of an element.

4.6.4.1 Impact Summary

Geology, mineral resources, and soils impacts would be considered significant if the Proposed Project fulfills the CEQA impact statements listed below. Incorporating APMs described in Table 4-18 ensures compliance with existing applicable regulations, as well as integration of design features and standard operating procedures that prevent most potentially significant impacts. Potential geology, mineral resources and soils impacts are summarized below. They are described in detail for the proposed transmission line and alternatives, for Ivanpah Substation, and for the underground conduit locations, along with applicable mitigation measures, in Appendix E.

<u>Geology [Seismic] and Soils</u>

1. Would the Project expose people or structures to adverse effects as a result of rupture of an Alquist-Priolo Earthquake Fault or other substantial known fault?

Construction Impacts

Construction activities are temporary in nature. The likelihood of a fault rupture occurring at a construction site while people are present is low. Therefore, it is unlikely that the Project would expose people or structures to adverse fault rupture effects, and this potential impact is considered less than significant.

Operational Impacts

Operational activities involve periodic maintenance and inspections. The likelihood of a fault rupture occurring at a facility site while people are present is low. In addition, transmission line structures and the microwave towers would not be placed on or near a known active or potentially active fault zone. Therefore, it is unlikely that the Project would expose people or structures to adverse fault rupture effects, and this potential impact is considered less than significant.

2. Would the Project expose people or structures to adverse effects as a result of seismic ground shaking?

Construction Impacts

Construction activities are temporary in nature. The likelihood of a large earthquake occurring near a construction site, generating strong ground motion while people are present, is very low. Therefore, it is unlikely that the Project would expose people or structures to adverse seismic ground shaking effects, and this potential impact is considered less than significant.

Operational Impacts

Operational activities involve periodic maintenance and inspections. The likelihood of a large earthquake occurring near the substation or a facility site, generating strong ground motion while people are present, is very low. In addition, substation facilities, microwave towers, and transmission line structures are designed to withstand strong ground motion. Therefore, it is unlikely that the Project would expose people or structures to adverse seismic ground shaking effects, and this potential impact is considered less than significant.

3. Would the Project expose people or structures to adverse effects as a result of seismic related ground failure including liquefaction?

Construction and Operational Impacts

Due to the general lack of shallow ground water and liquefaction prone sediments, seismic-related ground failures are not expected in the Project area. Therefore, the Project would not expose people or structures to adverse seismic-related ground failure effects, including liquefaction. As a result, seismic-related ground failures are not expected during construction or operations and no associated impacts are anticipated.

4. Would the Project expose people or structures to adverse effects as a result of landslides?

Construction Impacts

Construction activities are temporary in nature. The likelihood of a landslide occurring near a construction site while people are present is low due to the predominant geologic conditions and because SCE's APMs for construction within a potential landslide hazard area would minimize potential damage from landslides or rock falls. Therefore, it is unlikely that the Project would expose people or structures to adverse landslide effects, and this potential impact is considered less than significant.

Operational Impacts

Operational activities involve periodic maintenance and inspection of transmission structures and microwave towers. The likelihood of a landslide occurring near a transmission structure or a microwave tower while people are present is low. In addition, incorporating SCE's APMs for transmission line structures within a known landslide hazard area would minimize potential damage from rock falls. Therefore, it is unlikely that the Project would expose people or structures to adverse landslide effects, and this potential impact is considered less than significant.

Potential landslide hazards were not identified near the substation site. Therefore, this Project component would not expose people or structures to adverse landslide effects, and no impact is anticipated.

5. Would the Project result in substantial soil erosion or the loss of topsoil?

Construction Impacts

Grading activities for new roads and the substation site could create the potential for soil erosion. Incorporating SCE's APMs as an integral part of the Project would ensure compliance with existing regulations, and thus, construction activities would not contribute to substantial erosion or loss of topsoil. Therefore, this impact is considered less than significant.

Operational Impacts

Operational activities associated with the transmission structures and microwave tower, such as maintaining access roads, could contribute to runoff water that causes minor erosion and to wind erosion with re-deposition of sand away from the roads. Incorporating SCE's APMs as an integral part of the Project would ensure compliance with existing regulations, and thus, construction activities would not contribute to substantial erosion or loss of topsoil. Therefore, this impact is considered less than significant.

Operation of the substation would redirect stormwater during flash floods, could create or contribute to runoff water that might cause minor erosion, and could lead and to wind erosion with re-deposition of sand within and down wind from the substation. Incorporating SCE's APMs as an integral part of the Project would ensure compliance with existing regulations, and thus, construction activities would not contribute to substantial erosion or loss of topsoil. Therefore, this impact is considered less than significant.

6. Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project and potentially result in on-site or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

Construction and Operational Impacts

Through incorporation of APMs, SCE would identify potentially unstable geologic units and develop design measures as an integral part of the project to address these issues. Therefore, potential impacts associated with unstable geologic units or soils that could result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction or collapse are considered less than significant.

7. Would the Project be located on expansive soil, creating substantial risks to life or property?

Construction and Operational Impacts

With one exception, geologic and soil units have a low potential for expansive clays. By incorporating APMs as an integral part of the Project, SCE would identify areas with the potential for expansive soil and develop design measures to address these issues. As a result, the Project would not create substantial risks to life or property associated with expansive soil, and potential impacts are considered less than significant.

8. Would the Project have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

Construction and Operational Impacts

Only the new substation could have permanent toilet facilities. With one exception, soils in the project area would have adequate drainage characteristics to support the use of septic tanks or alternative waste water disposal systems. By incorporating APMs as an integral part of the Project, SCE would determine the suitability of the substation site to utilize septic tanks or alternative waste water disposal systems. As a result, this potential impact is considered less than significant.

Mineral Resources

1. Would the Project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

Construction Impacts

There are no known active mining operations in the Project area. Therefore, the Project would not result in the loss of availability of a known mineral, and no impacts are anticipated during construction.

Operational Impacts

There are no known active mining operations or mineral claims in the Project area. Therefore, it is unlikely that the project would result in the loss of availability of a known mineral. It is possible that future mining claims could be established within proximity to the proposed facilities and that these claims could lead to mining activity. By incorporating APMs as an integral part of the Project, SCE would reduce the potential to impact the possible future development of mineral resources near the Project area. As a result, this potential impact is considered less than significant.

2. Would the Project result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

Construction and Operational Impacts

There are no known locally-important mineral resource recovery sites delineated on a local general plan, specific plan, or other land use plan. Therefore, no impacts are anticipated.

4.6.4.2 Impact Significance after Mitigation Measures

The potential impacts due to geology, mineral resources, and soils associated with construction and operation of the Proposed Project are considered to be less than significant. The aforementioned APMs have been incorporated into Proposed Project construction activities; mitigation measure MMGEO-1 is also suggested for possible future land subsidence effects. Considering the APM and MMGEO-1, potential significant geology, mineral resources, and soils impacts associated with construction and operation of the Proposed Project have been avoided or reduced to less-than-significant levels. No further mitigation is required.

Operational Impacts

The APM GEO-1 would define geotechnical conditions for the soils and geologic formations at the tower locations, and would prescribe foundation designs and remedial grading methods to minimize the potential for soil collapse. These actions should reduce the potential for soil collapse impacts to less than significant.

As development increases in the Ivanpah and Eldorado valley areas in the future, the potential for greater groundwater extraction will likely increase as well. While it is the policy of groundwater agencies in California and Nevada to manage groundwater basins to prevent overdraft and potential subsidence, these measures are sometimes put in place after evidence of subsidence appears. The following mitigation measure, MMGEO-1, is suggested, and its incorporation should reduce potential subsidence impacts to less than significant.

MMGEO-1: SCE shall contact the California Department of Water Resources and the Nevada Division of Water Resources on a periodic basis to determine if groundwater withdrawals are threatening to cause ground subsidence within the Project Area. If subsidence threatens tower locations, SCE shall develop a plan to mitigate potential damage to tower structures using standard foundation remediation techniques available.

4.6.5 <u>Evaluation and Comparison of Proposed Route and Alternatives</u>

4.6.5.1 No Project/No Action Alternative

The No Project Alternative is defined in Section 2.0. The No Project Alternative includes the assumption that existing transmission lines, substations, and power plants would continue to operate. The effects that these facilities cause on the existing environment would not change, so no new impacts would occur from continuing operation of the existing transmission lines, substations, and power plants. Also, under the No Project Alternative, the proposed Eldorado-Ivanpah Project would not be constructed, so the impacts associated with construction and operation of the project would not occur. These potential impacts avoided would include: adverse construction and operations impacts to personnel, equipment, and facilities due to geologic, seismic, and soils hazards; and, ground disturbance and increased erosion/ sedimentation.

The first component of the No Project Alternative is the continuation of ongoing demand-side actions, including energy conservation and distributed generation. These actions would result in limited or no impacts to geology, mineral resources, and soils.

The second component of the No Project Alternative is the continuation of supply-side actions, resulting in potentially increased generation within California and Nevada and/or increased transmission within and into California and Nevada to serve anticipated growth in electricity consumption. The impacts of other new power plants and other new transmission lines to geology, mineral resources, and soils should be approximately the same, depending on the locations of the projects, as those that would occur under the Proposed Project.

4.6.5.2 Comparison of Proposed Transmission Line Route to Alternative Routes and Underground Fiber Optic Conduit Alternatives

A comparison of the Proposed Project transmission line route with Alternative Routes A through E and of the underground fiber optic cable conduits Path 2-Section 2 and Path 2-Section 3-Alternatives 1 and 2 using geology, mineral resources, and soils factors is provided in Table 4-30. These factors are discussed for each location in the Environmental Setting section and Appendix E. Further discussion in Appendix E provides additional information regarding the determination of the superior alternatives. No alternatives, therefore no comparisons, are presented for the substations and microwave towers.

TABLE 4-30
COMPARISON OF THE PROPOSED TRANSMISSION LINE ROUTE WITH ALTERNATIVE ROUTES A THROUGH E, UNDERGROUND FIBER OPTIC CABLE CONDUIT PATH 2-SECTION 2 AND PATH 2-SECTION 3-ALTERNATIVES 1 AND 2 USING GEOLOGY, MINERAL RESOURCES, AND SOILS FACTORS

Transmission Lines	Proposed Route	Alt A	Proposed Route	Alt B	Proposed Route	Alt C	Proposed Route	Alt D	Proposed Route	Alt E
Tower Numbers → (Mileposts)	13 to 50 (1.3-705)	--	1 to 20 (0.1-2.1)	--	185 to 218 (26.9-31.3	--	184 to 203 (26.7-29.8)	--	4,300' of D	--
Comparison Factors [1]										
Geology and Soils Units										
Ease of Excavation	Moderate	Easy	Easy	Mod	Easy	Mod	Easy	Easy	Easy	Easy
Erosion Potential	Moderate	Low	Low-Mod	Mod	Low	Mod	Low	Low	Low	Low
Landslide Potential	Nil	Nil	Nil	Nil	Nil	Mod	Nil	Nil	Nil	Nil
Unstable Geology/ Soil Unit	Moderate	Low	Low	Mod	Low	Mod	Low	Low	Low	Low
Faults, Fault Rupture, and Seismicity										
Fault Rupture	Mod	Low	Mod	Mod	Mod	Mod	Mod	Mod	Nil	Nil
PGA 2% in 50 Years (%g)	16-20	16-17	16-20	17-20	13-16	13	13-16	13	13	13
Past Nearby Earthquake Activity	Moderate	Mod	Mod	Mod	Low	Low	Low	Low	Low	Low
Approximately PGA-Black	20-25	18-20	20-25	15-18	40-50	40-50	40-50	40-50	40-50	40-50

TABLE 4-30
COMPARISON OF THE PROPOSED TRANSMISSION LINE ROUTE WITH ALTERNATIVE ROUTES A THROUGH E, UNDERGROUND FIBER OPTIC CABLE CONDUIT PATH 2-SECTION 2 AND PATH 2-SECTION 3-ALTERNATIVES 1 AND 2 USING GEOLOGY, MINERAL RESOURCES, AND SOILS FACTORS

Transmission Lines	**Proposed Route**	**Alt A**	**Proposed Route**	**Alt B**	**Proposed Route**	**Alt C**	**Proposed Route**	**Alt D**	**Proposed Route**	**Alt E**
Hills/Mesquite Flats										
Mineral Resources										
Potential Minerals	Low	Low	Low	Low	Moderate	Mod	Moderate	Mod	Moderate	Mod
Existing Mines Nearby	None	None	None	None	None	None	None	None	None	None
Superior Transmission Line Route		***X***	***X***		***X***		***X***	***X***	***X***	***X***
FIBER OPTIC CONDUITS	**Path 2-Section 3-Alternative 1 South of Ivanpah Sub.**		**Path 2-Section 3-Alternative 2 North of Ivanpah Sub.**		1. The factors used in the comparison are discussed in the Environmental Setting section.					
Comparison Factors [1]										
Geology and Soils Units										
Ease of Excavation	Moderate		Moderate							
Erosion Potential	Moderate-High		Moderate-High							
Landslide Potential	Nil		Nil							
Unstable Geology/Soil Unit	Moderate		Moderate							
Faults, Fault Rupture, and Seismicity										
Fault Rupture	Nil		Nil							
PGA 2% in 50 Years	13% g		13% g							
Past Nearby Earthquake Activity	Low		Low							
Approximately PGA-Black Hills/Mesquite Flats	30-45% g		30-45% g							
Mineral Resources										
Potential Minerals	Moderate		Moderate							
Existing Mines Nearby	None		None							
Superior Fiber Optic Conduit Route	***X***		***X***							

4.6.6 References

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4.7 HAZARDS AND HAZARDOUS MATERIALS

This section contains a description of existing conditions and the potential hazards and hazardous materials impacts associated with the construction and operation of the Proposed Project and alternatives.

4.7.1 Regulatory Setting

Regulations, plans, and standards for management of hazards and hazardous materials have been promulgated by federal and state government. Federal and state governments allow local counties and cities to manage and/or implement many of the federal and state regulations relating to the handling, storage, and disposal of hazardous materials and waste. Administrative provisions have been enacted to allow for the planning, coordination, and reporting of hazardous materials and hazardous waste programs among federal, state, and local government. Potentially applicable federal, state, and local programs are presented below. A wider range of potentially applicable federal, state, and local hazardous material-related regulations could apply to the Proposed Project, depending on the results of the Phase I ESAs to be completed for the Proposed Project as part of APM HAZ-1 as discussed in Section 4.7.3.

The following provides summary definitions of hazardous materials and hazardous waste:

- **Hazard**: Any naturally occurring and man-made physical condition in the surrounding environment that would pose a public safety risk.

- **Hazardous Material:** Any material that due to its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. Hazardous materials include, but are not limited to, hazardous substances, hazardous waste, and any material which a handler or the administering regulatory agency has a reasonable basis for believing would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment (California Health and Safety Code, Section 25501). A number of properties may cause a substance to be considered hazardous, including toxicity, ignitibility, corrosiveness, or reactivity.

- **Hazardous Waste:** A waste or combination of waste which due to its quantity, concentration, or physical, chemical, or infection characteristics, may cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitation-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 (California Health and Safety Code, Section 25141). California waste identification and classification regulations are found in Title 22 of the CCRs.

Exposure to hazardous materials or wastes can occur: (1) during their normal handling, storage, and use (OSHA), (2) when released by spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (EPA), and (3) when any regulated substance, when being transported or moved, is a risk to public safety or the environment (USDOT).

4.7.1.1 Federal

Comprehensive Environmental Response, Compensation, and Liability Act (Superfund) of 1980. 42 U.S.C. §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. Through CERCLA, EPA has the power to seek out those parties responsible for any release and ensure their cooperation in the cleanup.

The 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. 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 U.S.C. Section 1251 et seq.

The CWA is the principal federal statute protecting navigable waters and adjoining shorelines from pollution. The law was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. Since its enactment, the CWA has formed the foundation for regulations detailing specific requirements for pollution prevention and response measures. The United States EPA implements provisions of the CWA through a variety of regulations, including the National Contingency Plan and the Oil Pollution and Prevention Regulations. Implementation of the CWA is the responsibility of each state.

Oil Pollution Prevention 40 CFR Part 112

The goal of the oil pollution prevention regulation in 40 CFR Part 112 is to prevent oil discharges from reaching navigable waters of the United States or adjoining shorelines. The rule was also written to ensure effective responses to oil discharges. The rule further specifies that proactive, and not passive, measures be used to respond to oil discharges. The oil pollution regulation contains two major types of requirements: prevention requirements (SPCC rule), and Facility Response Plan (FRP) requirements.

Facilities that could reasonably be expected to discharge oil into navigable waters in quantities that may be harmful are required to develop and implement SPCC Plans per the SPCC rule. EPA amended the SPCC Rule in 2006 to extend the SPCC compliance dates in §112.3(a), (b), and (c) for all facilities until October 31, 2007. SPCC Plans must be prepared, certified (by a professional engineer), and implemented by facilities which store, process, transfer, distribute, use, drill, produce, or refine oil or oil production.

Resource Conservation and Recovery Act 42 U.S.C. §6901 et seq.

The Resource Conservation and Recovery Act (RCRA) regulates hazardous waste from the time that waste is generated, through to its management, storage, transport, and treatment, until its final disposal. The EPA has authorized the Department of Toxic Substances Control (DTSC) in California and the NDEP to administer their respective RCRA programs.

U.S. Department of Transportation

The USDOT has the regulatory responsibility for the safe transportation of hazardous materials under the Hazardous Materials Transportation Act (HMTA), as amended and codified in 49 U.S.C. 5101 et seq.

Occupational Safety and Health Administration 29 CFR 1900-1910

Established under the OSHA Act of 1970, OSHA regulates workplace safety and health. The agency's mission is to prevent work-related injuries, illnesses, and deaths.

Hazard Management and Resource Restoration Program

The Hazard Management and Resource Restoration (HMRR) program is administered by the BLM. Its mission is to protect lives, resources, and property, and to improve the health of landscapes and watersheds by: (1) minimizing the environmental contamination on public lands, (2) reducing and eliminating risk associated with physical and environmental hazards, (3) restoring resources impacted by oil discharges and hazardous release, and (4) administering CERCLA assessments.

4.7.1.2 State

California

California Environmental Protection Agency

The California Environmental Protection Agency (Cal/EPA) is the California state agency responsible for developing, implementing, and enforcing the state's environmental protection laws that ensure clean air, clean water, clean soil, safe pesticides, and waste recycling and reduction. Cal/EPA oversees the DTSC and State Water Resources Control Board (SWRCB). Cal/EPA has implementation authority for the Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program) per CCR Title 27, Division 1, Subdivision 4, Chapter 1.

California Emergency Management Agency

The California Emergency Management Agency (Cal/EMA) was formed January 1, 2009, as the result of a merger between the Governor's Office of Emergency Services (OES) and the Office of Homeland Security (OHS). The Hazardous Materials Unit of the Cal/EMA is responsible for hazmat emergency planning and response, spill release and notification, and hazmat enforcement of the Unified Program.

Department of Toxic Substances Control

Under Government Code Section 65962.5(a), the DTSC is required to compile and update as appropriate, but at least annually, and submit to the Secretary for Environmental Protection a list of all of the following:

1) All hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code.

2) All land designated as hazardous waste property or border zone property pursuant to Article 11 (commencing with Section 25220) of Chapter 6.5 of Division 20 of the Health and Safety Code.

Division of California Occupational Safety and Health, Department of Industrial Relations

The Division of California Occupational Safety and Health protects workers and the public from safety hazards (CCR Title 8.)

California-Nevada Supplemental Interstate Compact for Emergency Mutual Assistance, July 2007

Under the Supplemental Interstate Compact, the states of California and Nevada agree to provide emergency mutual aid assistance, whether an emergency has or has not been a governor-declared state of emergency. This compact supplements the EMA Compact agreed to by both states which specifically addresses state-declared emergencies.

<u>Nevada</u>

Nevada Administrative Code Chapter 459 Hazardous Materials

NAC Chapter 459 regulates hazardous materials within the state of Nevada.

Nevada Revised Statute 414 Emergency Management

NRS 414 established the authority to create a state agency for emergency management (Nevada Division of Emergency Management), thus enabling the rendering of mutual aid among the political subdivisions of the state.

Nevada Division of Environmental Protection, Nevada Department of Conservation and Natural Resources

The NDEP is the state agency responsible for the response and remediation of hazardous materials incidents, as designated by the State Comprehensive Emergency Management Plan.

Nevada Division of Emergency Management, Nevada Department of Public Safety

The Nevada Division of Emergency Management (NDEM) operates under the authority of NRS 414. The NDEM is responsible for staffing the State Emergency Operations Center (SEOC) when a disaster or emergency threatens, as well as prior to and during large scale events.

4.7.1.3 Local

California

Lahontan Regional Water Quality Control Board

The Lahontan RWQCB located in Victorville, California is responsible for protecting ground and surface water quality by developing and enforcing water quality objectives and implementation of a basin plan for San Bernardino County. The RWQCB administers water quality requirements, issues waste discharge permits, takes enforcement action against violators, and monitors water quality.

Certified Unified Program Agency

The CUPA is the agency certified by the DTSC to conduct the Unified Program. The program consists of hazardous waste generator and on-site treatment programs, aboveground and underground storage tank programs, Hazardous Materials Management, Business Plans, and Inventory Statements, and the Risk Management and Prevention Program.

San Bernardino County Fire Department

The San Bernardino County Fire Department, Hazardous Materials Division, is the CUPA responsible for administering the hazardous materials program within San Bernardino County.

Nevada

Office of Emergency Management, Clark County, Nevada

Clark County Office of Emergency Management is the designated single point of coordination for Clark County public safety projects, including: emergency management planning, preparation activities such as training and exercises, response support coordination during emergencies, and coordination of recovery programs following emergencies.

Nevada Task Force 1

Nevada Task Force 1 (NV TF-1) is one of 28 Federal Emergency Management Agency (FEMA) Urban Search and Rescue Task Forces that are prepared to respond to state or federal disasters throughout the United States. The task force can be deployed by FEMA for the rescue of victims due to man-made or natural disasters. NV TF-1 consists of members from the Clark County Fire Department, Las Vegas Fire and Rescue, the Henderson and North Las Vegas fire departments, as well as civilians from several private companies.

Clark County Fire Department Hazardous Materials Division

The Hazardous Materials Division of the Clark County Fire Department maintains first-responder responsibility for hazardous materials incidents within unincorporated areas of Clark County.

Civil Defense Mutual Aid Compact

Clark County, Nevada, and San Bernardino County, California, are parties to the compact that allows for both county agencies to provide emergency services, supply material and equipment, and allow for the exchange of information when a declared disaster exists within either jurisdiction.

4.7.2 Significance Criteria and Approach to Impact Assessment

4.7.2.1 Significance Criteria

According to Appendix G of the CEQA Guidelines, the Proposed Project would result in a significant impact if it would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school.
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to [California] Government Code Section 65962.5, and as a result create a significant hazard to the public or environment.
- Be located within an airport land use plan; or where such a plan has not been adopted, within 2 miles of a public airport or public use airport, resulting in a safety hazard for people residing or working in the Project area.
- Be located within the vicinity of a private airstrip, resulting in a safety hazard for people residing or working in the Project area.
- Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan.
- Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

4.7.2.2 Applicant Proposed Measures

The following APMs have been proposed by SCE to be incorporated into the Proposed Project design, as applicable.

HAZ-1: Phase I Environmental Site Assessment. A Phase I ESA would be performed at each new or expanded substation location and along newly acquired transmission or subtransmission line ROWs. The Phase I ESA would include an electronic records search of federal, state, and local databases. The electronic records search would be contracted to a company which specializes in this type of work and who would produce a comprehensive report (Report) for the new or expanded ROW. The Report is used to identify sites located on federal, state, and local government agency databases which may have the potential to impact the Proposed Project. The Report would be reviewed and, based on such review any potential areas of concern along the ROW would be identified for further assessment. In addition, a Phase I ESA which is compliant with ASTM 1927-05 (ASTM 2005) would be performed on all property to be acquired. Based on the results of the Phase I ESA, additional assessment, characterization, and remediation of potential or known subsurface impacts may be conducted prior to construction activities. Such remediation could include the relocation of transmission line structures as necessary to avoid impacted areas, or the removal and disposal of impacted soils and/or groundwater according to applicable regulations.

HAZ-2: Hazardous Materials and Waste Handling Management. Hazardous materials used and stored on-site for the proposed construction activities, as well as hazardous wastes generated on-site as a result of the proposed construction activities, would be managed according to the specifications outlined below as follows:

- **Hazardous Materials and Hazardous Waste Handling Program:** A Project-specific hazardous materials management and hazardous waste management program would be developed prior to initiation of the Project. The program would outline proper hazardous materials use, storage and disposal requirements, as well as hazardous waste management procedures. The program would identify types of hazardous materials to be used during the Project and the types of wastes that would be generated. All Project personnel would be provided with Project-specific training. This program would be developed to ensure that all hazardous materials and wastes were handled in a safe and environmentally sound manner. Hazardous wastes would be handled and disposed of according to applicable rules and regulations. Employees handling wastes would receive hazardous materials training and shall be trained in: hazardous waste procedures; spill contingencies; waste minimization procedures; and TSDF training in accordance with OSHA Hazard Communication Standard and 22 CCR. SCE would use landfill facilities that are authorized to accept treated wood pole waste in accordance with HSC 25143.1.4(b).

- **Construction Stormwater Pollution Prevention Plan:** A Project-specific construction SWPPP would be prepared and implemented prior to the start of construction of the transmission line and substations. The SWPPP would use BMPs to address the storage and handling of hazardous materials and sediment runoff during construction activities (California Stormwater Quality Association 2004).

- **Transport of Hazardous Materials:** Hazardous materials that would be transported by truck include fuel (diesel fuel and gasoline), and oil and lubricants for equipment. Containers used to store hazardous materials would be properly labeled and kept in good condition. Written procedures for the transport of hazardous materials used would be established in accordance with USDOT, CalTrans, and NDOT regulations. A qualified transporter would be selected to comply with federal and state transportation regulations.

- **Fueling and Maintenance of Construction Equipment:** Written procedures for fueling and maintenance of construction equipment would be prepared prior to construction. Vehicles and equipment would be refueled on-site or by tanker trucks. Procedures would include the use of drop cloths made of plastic, drip pans, and trays to be placed under refilling areas to ensure that chemicals do not come into contact with the ground. Refueling stations would be located in designated areas where absorbent pads and trays would be available. The fuel tanks would also contain a lined area to ensure that accidental spillage does not occur. Drip pans or other collection devices would be placed under the equipment at night to capture drips or spills. Equipment would be inspected daily for potential leakage or failures. Hazardous materials such as paints, solvents, and penetrants would be kept in an approved locker or storage cabinet.

- **Fueling and Maintenance of Helicopters:** Written procedures for fueling and maintenance of helicopters would be prepared prior to construction. Helicopters would be refueled at helicopter staging areas or local airports. Procedures would include the use of drop cloths made of plastic, drip pans, and trays to be placed under refilling areas to ensure that chemicals do not come into contact with the ground. Refueling areas would be located in designated areas where absorbent pads and trays are available.

- **Emergency Release Response Procedures:** An Emergency Response Plan detailing responses to releases of hazardous materials would be developed prior to construction activities. It would prescribe hazardous materials handling procedures for reducing the potential for a spill during construction, and would include an emergency response program to ensure quick and safe cleanup of accidental spills. All hazardous materials spills or threatened release, including petroleum products such as gasoline, diesel, and hydraulic fluid, regardless of the quantity spilled, would be immediately reported if the spill has entered a navigable water, stream, lake, wetland, or storm drain if the spill impacted any sensitive area, including conservation areas and wildlife preserved, or if the spill causes injury to a person or threatens injury to public health. All construction personnel, including environmental monitors, would be aware of state and federal emergency response reporting guidelines.

HAZ-3: Soil Management Plan. A Soil Management Plan would be developed and implemented for construction of the Proposed Project. The objective of the Soil Management Plan is to provide guidance for the proper handling, on-site management, and disposal of impacted soil that might be encountered during construction activities. The plan would include practices that are consistent with the California Title 8, OSHA regulations, as well as appropriate remediation standards that are protective of the planned use. Appropriately trained professionals would be on-site during preparation, grading, and related earthwork activities to monitor soil conditions encountered. The Soil Management Plan would provide guidelines for the following:

- Identifying impacted soil
- Assessing impacted soil
- Soil excavation
- Impacted soil storage
- Verification sampling
- Impacted soil characterization and disposal

In the event that potentially contaminated soils were encountered within the footprint of construction, soils would be tested and stockpiled. In California, the CUPA would determine whether further assessment is warranted. In Nevada, the NDEP BCA Spill Hotline (888-331-6337) would be contacted if the quantity of impacted material is greater than 3 cubic yards.

HAZ-4: Fire Management Plan. The Fire Management Plan developed by SCE and presented in this PEA as Appendix K would be implemented (National Fire Association 1994).

HAZ-5: Spill Prevention, Countermeasure, and Control Plan and Hazardous Materials Business Plan.

- **Spill Prevention, Countermeasure, and Control Plan.** In accordance with Title 40 of the CFR, Part 112, SCE would prepare a SPCC Plan for proposed and/or expanded substations. The plans would include engineered and operational methods for preventing, containing, and controlling potential releases, and provisions for quick and safe cleanup.

- **Hazardous Materials Business Plans.** Prior to operation of new or expanded substations, SCE would prepare or update and submit, in accordance with Chapter 6.95 of the CHSD, and Title 22 CCR, a HMBP. The required documentation would be submitted to the designated CUPA in California. (An HMBP or similar documentation is not required by the state of Nevada.) The HMBPs would include hazardous materials and hazardous waste management procedures, and emergency response procedures including emergency spill cleanup supplies and equipment.

4.7.2.3 Approach to Impact Assessment

Data for this section were obtained from publicly available records and documentation. Field inspections and restricted database searches were not conducted. A more detailed review will be conducted as part of the Phase I ESA in the future, pursuant to CEQA. The following publicly accessible databases and websites relating to known hazardous materials sites were queried:

- Cal/EPA DTSC EnviroStor database of cleanup sites and hazardous waste permitted facilities.
- NDEP BCA Corrective Actions/Leaking Underground Storage Tanks (LUST) database.
- EPA National Priorities List (NPL) database.
- EPA Region 9: Cleanup in the Pacific Southwest interactive website.

4.7.3 Environmental Setting

4.7.3.1 Regional Setting

SCE proposes to construct a new 220kV-115kV substation and a new 220kV transmission line. The proposed Ivanpah Substation would be located in San Bernardino County, California, approximately 7 miles southwest of Primm, Nevada, in Clark County. The substation would include 220kV and 115kV switchracks. The new 220kV transmission line would replace 35 miles of the of existing El Dorado–Baker–Coolwater–Dunn Siding–Mountain Pass 115kV transmission line, situated between the existing El Dorado Substation in Clark County, Nevada, and the new Ivanpah Substation. Replacement of the 115kV line with 220kV double-circuit structures (the Eldorado-Ivanpah 220kV transmission line) would mostly be within the existing ROW.

The Proposed Project also includes: (1) replacement of an OHGW with OPGW on an approximately 25-mile section of the Eldorado – Lugo 500kV line; (2) installation of between 22 and 30 miles of ADSS on 33kV distribution line poles and underground fiber optic cable between a 500kV tower near the town of Nipton, California, and the Ivanpah Substation; (3) construction of an approximately 1-mile section of the 33kV Nipton distribution line; and (4) changes inside the Eldorado Substation to accommodate the new 220kV lines.

The entire Proposed Project would span approximately 28 miles in Nevada and approximately 7 miles in California.

4.7.3.2 Local Setting

The Proposed Project area is situated primarily in open desert that is characterized by minimal vegetation and vacant land with sparse development areas in both Clark and San Bernardino counties. The potential for encountering hazards and hazardous material sites in the area is very low due to the lack of residential, commercial, and industrial development. EPA, DTSC, and NDEP database searches revealed no known hazardous materials sites located within the Proposed Project's study area.

The San Bernardino County portion of the Proposed Project is not located within a designated Hazard Overlay area. According to the Nevada Hazard Mitigation Plan, the Proposed Project's transmission lines and substations within Clark County would not be located within a designated "Wildfire Hazard Community," with the exception of Primm, Nevada, which is assigned a "Low" wildfire hazard rating.

The closest proximity to a public use airport is the Proposed Project's new 220kV transmission line, which is at a distance of approximately 4.5 miles south of the Jean Airport in Jean, Nevada. The Jean Airport offers 24-hour, self-service 100LL and Jet A aircraft fuel. South of Jean Airport is the proposed location of the Clark County Department of Aviation (CCDOA) Southern Nevada Supplemental Airport (SNSA). SNSA, also referred to as the Ivanpah Valley Airport, would lie partially within the base floodplain of a portion of Roach Dry Lake located between I-15 and the UPRR roughly 30 miles south of Las Vegas, Clark County, Nevada. The new 220kV transmission line would be located within approximately 0.5 mile of the southern airport boundary. The airport is expected to be operational in year 2017 to relieve air traffic congestion at McCarran International Airport in Las Vegas, and is currently undergoing an EIS jointly lead by the BLM and the FAA.

The existing 115kV transmission line aerially spans I-15 in the vicinity of Milepost 29 (Figure 4.6-1, located in Map Volume), an emergency response and evacuation route in the area; therefore, the proposed route, Alternatives C and D of the 200kV transmission line would also span I-15. Alternatives A and B, specific to the Eldorado Substation, are located in remote areas that would not affect routes identified in emergency response or evacuation plans.

The existing 115kV transmission line is supported by six wood poles and 23 H-frames that are chemically treated. The proposed 220kV transmission line replacement poles and frames would be constructed of steel and supported by concrete footings. Transformers would utilize non-PCB mineral oils.

I-15, an emergency response and evacuation route, would be aerially spanned by telecommunications Path 1 in the vicinity of Milepost 29, and by telecommunications Path 2-Section 3-Alternative 2 in the vicinity of Milepost 6. Equipment within the telecommunication rooms collocated with the Ivanpah and Mountain Pass substations will not require fuels or lubricants.

Based on existing information, the proposed 220kV and alternative routes would be located in areas not documented to contain hazardous materials or hazardous wastes. SCE would perform a Phase I ESA prior to acquisition of new property to identify potential impacts to soil or groundwater in the areas to be graded or excavated as part of the Proposed Project.

A 500 kW engine-generator would be operational at the Eldorado Substation. The generator's integral fuel tank has a 793-gallon capacity for diesel fuel. This substation also currently maintains a vehicle fueling facility with a capacity of 1,500 gallons of gasoline and 500 gallons of diesel. It would continue to be maintained for the Proposed Project. No such equipment or fueling facilities are planned for the proposed Ivanpah Substation.

During the construction phase of the Proposed Project, a total of six fenced temporary construction yards (one in San Bernardino County and five within Clark County) would be established in previously disturbed areas. The construction yards would intermittently house employee vehicles, construction equipment and materials, and tanker trucks of gasoline, diesel, and aviation (100LL) fuels for the refueling of Project vehicles and equipment. The quantity of each tanker truck is anticipated to be roughly 500 gallons each. Routine maintenance of construction vehicles would be conducted within the construction yards. Air operations involving refueling will occur at Jean Airport with the potential for exception-based field operations in a helicopter staging area in acquired ROW. Storage at construction yards also includes joint compounds that are applied from 1-pound tubes to compression fittings to protect aluminum components from water-induced corrosion. Certain joint compounds, such as Alcoa's Electrical Joint Compound #2, may contain hydrogen fluoride, a component listed in California as a hazardous substance. An industrial landfill would be used for the disposal of any joint compound waste.

4.7.4 Impact Analysis and Mitigation Measures

This section addresses the potential construction and operation impacts as a result of the Proposed Project and mitigation measures.

Would the Proposed Project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Construction Impacts

During construction activities, hazardous materials such as vehicle fuels and other maintenance materials would be used and stored in construction staging areas. There is potential for incidents involving the accidental release of gasoline, diesel fuel, oil, hydraulic fluids and lubricants, paints, solvents, adhesives and joint compound, and cleaning chemicals. In addition, waste oils, waste hydraulic fluids, discarded batteries, and waste solvents and adhesives would be anticipated to be generated during construction activities. Spills and leaks of hazardous materials or hazardous wastes during construction could potentially result in impacts to soil or groundwater.

Helicopters would be used during construction for wire installation. The operation areas for helicopters would be limited to helicopter staging areas and previously disturbed positions along the ROW. Helicopter fueling would occur at helicopter staging areas or at local airports. Spills and leaks of hazardous materials during construction activities utilizing helicopters due to improper handling and storage of helicopter fuels could potentially result in impacts to soil or groundwater; however, use of the existing fueling facilities at Jean Airport would greatly reduce the probability of such occurrences. Implementation of APMs HAZ-2 and HAZ-5 relating to materials associated with the construction and helicopter staging areas would result in less-than-significant impacts.

Removal of the 115kV transmission line wood poles and frames (treated wood waste) would result in either (1) disposal in a permitted Class I hazardous waste land fill, (2) return to the manufacturer, or (3) re-use by SCE for an unrelated project(s). Thus, the removal and proper disposal of the wood poles and frames would not result in an impact.

Operation Impacts

The Proposed Project would require transport of diesel and gasoline to the Eldorado Substation for the fueling of the 500 kilowatts (kW) engine generator and to replenish supplies of gasoline and diesel for the existing fueling facility. Implementation of APMs HAZ-2 and HAZ-5 relating to material handling and spill prevention associated with the operation of the Eldorado Substation would result in less-than-significant impacts.

Would the Proposed Project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident involving release of hazardous materials?

Construction Impacts

As mentioned above, hazardous materials such as vehicle fuels and other maintenance materials would be used and stored in construction staging areas during construction activities. There would be potential for the accidental release of gasoline, diesel fuel, oil, hydraulic fluids and lubricants, paints, solvents, adhesives, and cleaning chemicals. In addition, waste oils, waste hydraulic fluids, discarded batteries, and waste solvents and adhesives would be anticipated to be generated during construction activities. Accidental spills and leaks of hazardous materials or hazardous wastes during construction could potentially result in impacts to soil or groundwater. However, the impact relating to accidental releases of hazardous materials would be less than significant as a result of implementation of APMs HAZ-2 and HAZ-5.

Helicopters would be used during construction for wire installation. The operation areas for helicopters would be limited to helicopter staging areas and positions along the ROW that have been previously disturbed. Helicopter fueling would occur at helicopter staging areas or at local airports. Accidental spills and leaks of hazardous materials during construction activities utilizing helicopters due to improper handling and storage of helicopter fuels could potentially result in impacts to soil or groundwater; however, use of the existing fueling facilities at Jean Airport would greatly reduce the probability of such occurrences. Further, the impact relating to accidental releases of hazardous materials would be less than significant as a result of implementation of APMs HAZ-2 and HAZ-5.

Operation Impacts

The Proposed Project would require transport of diesel and gasoline to the Eldorado Substation for the fueling of the 500 kW engine generator and to replenish supplies of gasoline and diesel for the existing fueling facility. There would be potential for the accidental release of diesel and gasoline fuels. Implementation of APMs HAZ-2 and HAZ-5 relating to material handling and spill prevention associated with the operation of the Eldorado Substation would result in less-than-significant impacts.

Would the Proposed Project emit hazardous materials or handle acutely hazardous materials within 0.25 mile of a school?

There are no existing or proposed schools located with 0.25 mile of the Proposed Project's transmission lines, substations, and telecommunications improvements or their alternates. Therefore, there would be no impact from hazardous emissions or handling of hazardous or acutely hazardous materials, substances, or waste as the result of the construction or operations of the Proposed Project.

Would the Proposed Project be located on a site which is included on a list of hazardous materials sites compiled pursuant to government code Section 65962.5, and as a result create a significant hazard to the public or environment?

There are no federal or state hazardous material sites located within the Proposed Project's study area. Therefore, the construction and operations of the Proposed Project's transmission lines, substations, and telecommunications improvements or their alternates would not create a hazard to the public or environment; thus, no impacts would occur.

However, per AMP HAZ-1, a Phase I ESA will be conducted in the future and any hazardous material sites located within the Proposed Project ROWs will be disclosed and addressed.

For a project located within an airport land use plan or where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the Proposed Project result in a safety hazard for people residing or working in the Project area?

<u>Construction Impacts</u>

There are no existing public or public use airports within the Proposed Project area. The closest airport is Jean Airport in Jean, Nevada, which is located approximately 4.5 miles northwest of the proposed 220kV transmission line. Therefore, the construction of the Proposed Project's transmission lines, substations, and telecommunications improvements and/or their alternates would not result in a safety hazard for people residing or working in the Project area; thus, no impacts would occur.

<u>Operation Impacts</u>

At its closest point, the proposed Ivanpah Valley Airport boundary would be constructed within 0.5 mile north of the existing 115kV transmission line and the future 220kV transmission line. The 220kV transmission line lattice steel towers would extend 180-feet high. The design and construction of the future airport by the CCDOA will be required to be completed in accordance with FAA Part 77 Obstructions to Navigable Airspace and FAA Advisory Circular 150/5300-13, Airport Design, which will address the SCE transmission lines as warranted. As such, the Proposed Project would not result in an impact to airport operations.

For a project within the vicinity of a private airstrip, would the Proposed Project result in a safety hazard for people residing or working in the Project area?

There are no private airstrips located within the vicinity of the Proposed Project. Therefore, the construction and operations of the Proposed Project's transmission lines, substations, and telecommunications improvements and/or their alternates would not create a hazard for people residing or working within the Project area; thus, no impacts would occur.

Would the Proposed Project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Construction Impacts

The Proposed Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. All construction activity would occur within the Proposed Project ROW. However, in the event an activity is planned that could affect traffic (i.e., equipment delivery necessitating lane closures, stringing lines across major roadways), SCE would consult with local agencies, including CalTrans and NDOT, to implement transportation and traffic APMs (see Section 4.14 of this PEA). All traffic-related impacts would be reduced to less-than-significant levels.

Operation Impacts

The operation and maintenance of the Proposed Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Thus, no impacts would occur.

Would the Proposed Project expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

Construction Impacts

The risk of fire danger from the Proposed Project would be related to smoking, refueling, and operating vehicles and other equipment off roadways. Welding during construction of towers or support structures could also potentially result in the combustion of native materials in close proximity to the welding site.

SCE has developed APM HAZ-4, a Fire Management Plan (included as Appendix K in this PEA). The Fire Management Plan addresses construction activities for the Project by establishing standards and practices that would minimize the risk of fire danger; and in the case of fire, provide for immediate suppression and notification. The Fire Management Plan addresses spark arrestors, smoking and fire rules, storage and parking areas, use of gasoline-powered tools, road closures, use of a fire guard, and fire suppression equipment and training requirements. In addition, all vehicle parking, storage areas, stationary engine site, and welding areas would be cleared of all vegetation and flammable materials. All areas used for dispensing or storage of gasoline, diesel fuel, or other oil products would be cleared of vegetation and other flammable materials. These areas would be posted with a sign identifying them as “No Smoking” areas. Furthermore, the Proposed Project is not located in areas warranting hazard designations from either the State of Nevada or San Bernardino County.

As a result, the impact would be less than significant.

Operation Impacts

Transmission lines may pose a fire hazard when a conducting object comes in close proximity to a line or when a live-phase conductor falls to the ground. During maintenance activities, there would be a risk of fire danger from operating vehicles and other equipment off roadways during maintenance. As applicable, SCE would maintain vegetation clearance during the life of the Project to reduce the fire hazard potential.

SCE has developed a Fire Management Plan (Appendix K). The Fire Management Plan addresses operation and maintenance and establishes standards and practices that will minimize the risk of fire danger, and in the case of fire, provide for immediate suppression and notification. With implementation of the measures presented in SCE's Fire Management Plan (APM HAZ-4), and in conjunction with being located in low hazard areas, impacts associated with wildfire hazards would be less than significant.

4.7.4.2 Mitigation Measures

The aforementioned APMs will be incorporated into the Proposed Project design; therefore, any potentially significant impacts would be avoided or reduced to less-than-significant levels, and no mitigation required.

4.7.4.3 Impact Significance after Mitigation Measures

The potential impacts from hazards and hazardous materials associated with construction and operation of the Proposed Project are considered to be less than significant.

4.7.5 Evaluation and Comparison of Proposed and Alternative Routes

In terms of hazards and hazardous materials, the 220kV proposed route and the alternative routes do not offer advantages when compared to one another. Irrespective of the route to be constructed, the potential for impacts would be equivalent as there would be no variances in construction and operation characteristics of the routes.

Implementation of the telecommunications microwave (Path 2-Section 3A) in comparison to Path 2-Section 3-Alternatives 1 and 2, may reduce the potential of hazards and hazardous impacts because it would eliminate the need for approximately 20 (Alternative 2) to 25 (Alternative 1) miles of additional telecommunications lines that would be constructed between the Nipton Road-UPRR intersection and the proposed Ivanpah Substation. By eliminating Alternatives 1 and 2, the need for using, maintaining, and refueling construction vehicles is also eliminated. This would result in the reduction in the routine transport, use, or disposal of hazardous materials, as well as a reduction in the potential for reasonably foreseeable upsets and accidents involving releases of hazardous materials.

4.7.6 References

California Department of Toxic Substances Control (DSTC). 2009. EnviroStor database query. [online] http://www.envirostor.dtsc.ca.gov/public/. Accessed January 28, 2009.

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EPA Region 9: Cleanup in the Pacific Southwest. 2009. Nevada cleanup sites query. [online]. http://www.epa.gov/region09/cleanup/nevada.html. Accessed January 23 and 28, 2009.

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Nevada Division of Environmental Protection, Bureau of Corrective Action. 2009. Corrective Actions/Leaking Underground Storage Tanks (LUST) database query. [online]. http://ndep.nv.gov/bca/data.htm. Accessed January 23, 2009.

4.8 HYDROLOGY AND WATER QUALITY

4.8.1 Regulatory Setting

4.8.1.1 Federal

The CWA (33 U.S.C. Section 1251 et seq.), formerly the Federal Water Pollution Control Act of 1972, was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain non-point source discharges to surface water. Those discharges are regulated by the National Pollutant Discharge Elimination System (NPDES) permit process (CWA Section 402). Projects that disturb 1 or more acres are required to obtain NPDES coverage under the General Permit for each state. The Construction General Permits require the development and implementation of a SWPPP.

Section 401 of the CWA requires that any activity, including river or stream crossings during transmission line construction that may result in a discharge into a state waterbody must be certified by the applicable state agency to ensure that the proposed activity does not violate state and/or federal water quality standards. Section 404 of the CWA authorizes the USACE to regulate the discharge of dredged or fill material to the waters of the U.S. and adjacent wetlands. The USACE issues individual site-specific or general (Nationwide) permits for such discharges.

4.8.1.2 State

California

In California, NPDES permitting authority is delegated to and administered by one of the SWRCB 9 RWQCB. For the Proposed Project area, the NPDES permitting authority is Region 6, Lahontan RWQCB (SWRCB Lahontan Region 2008). NPDES coverage is under the General Permit for Discharges of Storm Water Associated with Construction Activity. As noted above, the Construction General Permits require the development and implementation of a SWPPP. Section 401 certification is made by the Lahontan RWQCB.

The Lahontan RWQCB Basin Plan implements the federal CWA (P.L. 92-500, as amended) and the State Porter-Cologne Water Quality Control Act (California Water Code § 13000 et seq.). Related federal laws include the following: Safe Drinking Water Act; Toxic Substances Control Act; Resource Conservation and Recovery Act; Endangered Species Act; the CERCLA (or “Superfund”); and SARA. A discussion of the CDFG’s Section 1602 SAA and wetland resource regulations is included in Section 4.4 Biology.

California Porter Cologne Water Quality Control Act - The Porter Cologne Water Quality Control Act of 1967, Water Code Section 13000 et seq, requires the SWRCB and the 9 RWQCBs to adopt water quality criteria to protect state waters. These criteria include the identification of beneficial uses, narrative and numerical water quality standards, and implementation procedures. The water quality criteria for California are governed by the Lahontan RWQCB.

Nevada

In Nevada, NPDES permitting authority is administered by the NDEP Bureau of Water Pollution Control (BWPC). Section 401 certification is made by the NDEP. NPDES coverage is under NDEP's General Permit NVR100000 for storm water discharge associated with construction activity.

A Notice of Intent for inclusion under the State of Nevada's General Storm Water Permit and a SWPPP is required for all soil-disturbing activities (including grading, trenching, demolition) where one or more acres will be disturbed, and have a discharge of storm water to a receiving water (e.g., wetlands, creeks, unnamed creeks, rivers, marine waters, ditches, estuaries) and/or storm drains that discharge to a receiving water. If the plan is to retain all stormwater on-site and detention facilities are to be constructed, permit coverage is required (NDEP 2008).

4.8.1.3 Local

The Proposed Project is exempt from local hydrology and water quality regulations in California. However, because SCE is complying with CPUC regulations governing transmission lines, CPUC GO No..131-D, Section XIV.B requires the utility to consult with local agencies regarding hydrology and water quality matters, SCE has considered local regulations as part of the current environmental review process.

San Bernardino County, California

Most counties and cities in California have floodplain and drainage regulations that regulate floodplain development. These regulations generally prohibit floodplain development that will result in flooding of the development, and prohibit floodplain development that will result in adverse flooding impacts on other property. In the San Bernardino County General Plan (2007), the conservation element is a part of this long-term planning document that contains policies for the flood control, land conservation, water quality, and water resources (San Bernardino County 2007).

Clark County, Nevada

Many counties and cities in Nevada regulate floodplain development. The regulations generally prohibit floodplain development that will result in flooding of the development or that will result in adverse flooding impacts on other property. Transmission line construction projects are not specifically addressed. The Clark County Comprehensive Plan is a long-term general policy plan for the physical development of unincorporated Clark County. In the Clark County Comprehensive Plan (2006), conservation elements are a part of this long-term planning document that contain policies for the flood control, land conservation, water quality, and water resources.

4.8.2 Significance Criteria and Approach to Impact Assessment

Listed below are the significance criteria on which impact determinations are based. APMs relevant to hydrology and water resources impacts then follow. These are measures integrated as part of the Proposed Project to prevent or minimize potential impacts, or comply with existing regulations. Last in this subsection is an explanation of how impacts are assessed. Section 4.8.4 lists and discusses all impacts and corresponding mitigation measures in addition to the APMs identified for the proposed transmission line route, transmission line route Alternatives A through E, Ivanpah Substation, and underground fiber optic conduit locations Path 2-Section 2 and Path 2-Section 3-Alternatives 1 and 2.

4.8.2.1 Significance Criteria

Hydrology and water resources impacts will be considered significant if the Proposed Project fulfills any of the impact criteria listed below.

Would the Proposed Project:

- Violate any water quality standards or waste discharge requirements?
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on-site or off-site?

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-site or off-site?

- Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?

- Otherwise substantially degrade water quality?

- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

- Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?

- Inundation by seiche, tsunami, or mudflow?

4.8.2.2 Applicant Proposed Measures

In its Application to the CPUC, SCE includes design measures and standard operating procedures that are integral components of the Proposed Project. Defined as APMs, these design measures and operating procedures include activities required for compliance with existing regulations, such as preparing SWPPPs. Table 4-31 (SCE 2008a) presents the APMs that are relevant to this section. The impact analysis provided in Section 4.8.4 assumes that all APMs, as defined in Table 4-31, are implemented during project execution. If it is determined that SCE's APMs do not fully minimize potential impacts identified, mitigation measures are recommended in Section 4.8.5.

TABLE 4-31
APPLICANT PROPOSED MEASURES FOR HYDROLOGY AND WATER QUALITY

APM No.	Description
APM W-1	Construction equipment will be kept out of flowing stream channels except when absolutely necessary to construct crossings.
APM W-2	Erosion control and hazardous material plans will be incorporated into the construction bidding specifications to ensure compliance.
APM W-3	Appropriate design of tower footing foundations, such as raised foundations and/or enclosing flood control dikes, will be used to prevent scour and/or inundation by a 100-year flood. Where floodplain encroachment is required by the CPUC and/or the BLM, and potential impacts require non-standard designs, hydrology/channel flow analysis would be performed.

TABLE 4-31 APPLICANT PROPOSED MEASURES FOR HYDROLOGY AND WATER QUALITY	
APM No.	**Description**
APM W-4	Towers will be located to avoid active drainage channels, especially downstream of steep hillslope areas, to minimize the potential for damage by flash flooding and mud and debris flows.
APM W-5	Diversion dikes will be required to divert runoff around a tower structure or a substation site if (a) the location in an active channel (or channels) cannot be avoided; and (b) where there is a very significant flood scour/deposition threat, unless such diversion is specifically exempted by the CPUC and/or the BLM Authorized Officer.
APM W-6	Runoff from roadways will be collected and diverted from steep, disturbed, or otherwise unstable slopes.
APM W-7	Ditches and drainage devices will be designed to handle the concentrated runoff, will be located to avoid disturbed areas, and will have energy dissipations at discharge points. These may include rip-rap, concrete aprons, stepped spillways, etc. Where diversion dikes are required to protect towers or other Project structures from flooding or erosion, these dikes would be designed to avoid increasing the risk of erosion or flooding onto adjacent property.
APM W-8	Cut and fill slopes will be minimized by a combination of benching and following natural topography where possible.
APM W-9	Prepare and implement an approved SWPPP. As a part of the SWPPP, soil disturbance at tower construction sites and access roads shall be the minimum necessary for construction and designed to prevent long-term erosion through the following activities: restoration of disturbed soil, re-vegetation, and/or construction of permanent erosion control structures. Implement BMPs in the project SWPPP during construction to minimize the risk of an accidental release.
APM W-10	The Emergency Release Response Procedures developed pursuant to APM Haz-2 would be maintained on-site (or in vehicles) during construction of the Project.
APM W-11	Conduct a WEAP to communicate environmental concerns and appropriate work practices, including spill prevention, emergency response measures, and proper BMP implementation, to all field personnel prior to the start of construction. This training program will emphasize site-specific physical conditions to improve hazard prevention. It will include a review of all site-specific plans, including but not limited to the project's SWPPP and Hazardous Substances Control and Emergency Response Plan. SCE will document compliance and maintain a list of names of all construction personnel who have completed the training program.
APM W-12	All construction and demolition waste, including trash and litter, garbage, and other solid waste, shall be removed and transported to an appropriately permitted disposal facility. Petroleum products and other potentially hazardous materials shall be removed and transported to a hazardous waste facility permitted or otherwise authorized to treat, store, or dispose of such materials.
APM W-13	Prior to excavation, SCE or its contractors will locate overhead and underground utility lines, such as natural gas, electricity, sewage, telephone, fuel, and water lines, or other underground structures that may reasonably be expected to be encountered during excavation work.
APM W-14	Prepare or update SPCC Plans for substations to minimize, avoid, and/or clean up unforeseen spill of hazardous materials during facility operations.

4.8.2.3 Approach to Impact Assessment

The Proposed Project transmission line, the Alternatives A though E, and the Telecommunication System components (including Path 2-Section 2, Path 2-Section 3-Alternatives 1 and 2, and the microwave tower) are the subject of the environmental analysis in Section 4.8. Each of the Project components requires actions and physical facilities that can impact the hydrology and water quality of the Project area in the short- and long-term. The impacts of these actions and facilities will be different depending upon the environment found at the location in question. Based on the Project description for each component and the hydrology and water quality conditions within the Proposed Project area, potential impacts are determined and classified by significance. By incorporating SCE's APMs as a defined part of the Project, potential hydrology-related project impacts are minimal. Where a potentially significant impact is identified, mitigation measures are proposed to reduce the impact to an acceptable level. Remaining potentially unmitigated impacts are identified.

4.8.3 Environmental Setting

4.8.3.1 Regional Setting

This section presents a discussion of the climate, Surface Drainage and Flooding, floodplains, groundwater, and water quality in the Project area, followed in Section 4.8.4 by a more specific discussion of each of these issues by segment along the Proposed Route, the Alternative Routes A through E, and the Telecommunication System components (including Path 2-Section 2, Path 2-Section 3-Alternatives 1 and 2, and the microwave tower), collectively the Proposed Project area.

Data collection for this analysis consisted of: identifying and collecting readily available hydrology and water quality information from local, state, and federal agency sources; obtaining information from SCE databases (SCE 2008b); conducting a 2-day field reconnaissance along the Proposed Project area routes/locations; and reviewing readily available aerial photographs and topographic maps. Identification of significant surface water features was done using aerial photographs, topographic maps, and field observations.

Climate and General Setting

The climate of southeastern Nevada and eastern California Mojave Desert is characterized by hot, dry summers and mild to cold winters. Most rain is in the winter, but August typically has some monsoonal storms. Spring is typically the windiest season and fall is typically the driest and least windy. There is no readily available long-term climate data known from stations within the Project area. Climate data from four stations is considered: Barstow (approximately 110 miles to the west-southwest), Needles (approximately 70 miles to the southeast), Las Vegas (approximately 30 miles to the north), and Mountain Pass (approximately 28 miles to the southwest of McCullough Mountain crossing). Normal annual precipitation totals at the first three stations (4.14, 4.39, and 4.49 inches, respectively) are low, with typically the highest 3 months in January through March and the lowest April through June. Monthly average temperatures (64.0, 72.8, and 68.1 degrees Fahrenheit, respectively) are moderate, with annual maximum and minimum temperatures (not extremes) on the order of 109 degrees Fahrenheit and 32 degrees Fahrenheit (Desert Research Institute, Western Regional Climate Center 2008).

Surface Water

Watershed Characteristics

The proposed route and Alternatives A through E occur in multiple watersheds flowing to the Eldorado Valley, Jean Lake Valley, and Ivanpah Valley, all with internal surface drainage. These are formally divided into hydrographic basins that encompass entire major watershed areas as shown in Table 4-32 for both Nevada and California. From the northern to southern portions of the Project area, flow originates primarily from: the east and west slopes of the

McCullough Mountains; the east and west slopes of the Lucy Gray Mountains; the east slopes of the Clark Mountains; and the northwest slopes of the New York Mountains (Figure 4.8-1, located in Map Volume). Surface drainage and flooding are primarily associated with desert washes varying in width from several feet to over 1,000 feet, which have no appreciable surface flow during most of the year. Most washes flow only in response to rainfall, particularly to the higher intensity monsoon rains that occur in late summer; some smaller washes along the mountain front may have occasional spring flow with very low flow rates. Evidence of sheet flow flooding on alluvial fan surfaces was observed during the field reconnaissance.

For purposes of this analysis, desert washes are classified on the basis of potential flood hazard after Nevada Bureau of Mines and Geology (NBMG) studies (House 2006) available for the Proposed Project transmission line route from the California-Nevada border to the western edge of the McCullough Mountains near McCullough Pass. Flood hazard potential is classified as Very High, High, Moderate, and Low based on the mapping of alluvial geologic units with these flooding characteristics[2]. Classifications are primarily based on relative frequency, vigor, surface stability, and landform type, and therefore should relate to both inundation potential and potential flow velocities that could adversely impact structures. Where this information is not available in California and the McCullough Mountains to Eldorado Valley, the classifications were estimated based on inspection of aerial photographs. Each classification was applied to individual 1:10,000 scale map sheets, and the proposed transmission line route milepost numbers, Alternatives, and substations as shown in Table 4-32. Without detailed field verification these classifications should be considered on a relative (comparison) basis.

TABLE 4-32
SUMMARY OF WATERSHED CHARACTERISTICS FOR THE ELDORADO-IVANPAH 220KV TRANSMISSION LINE PROPOSED ROUTE AND ALTERNATIVES A THROUGH E, UNDERGROUND FIBER OPTIC CONDUITS, MICROWAVE TOWER, AND ELDORADO AND IVANPAH SUBSTATIONS

Basin Number	Area Number	Size (square miles)	Size (acres)	Hydrographic Area/ Sub-Area Name	County	Nearby Cities
NEVADA (Central Region-Hydrographic Region 10)						
10	164A	253	161,920	Ivanpah Valley/Northern Part	Clark	Roach, Searchlight
10	164B	73	46,720	Ivanpah Valley/Southern Part	Clark	Jean, Roach, Goodsprings
10	165	96	61,440	Jean Lake Valley	Clark	Jean, Goodsprings
10	167	530	339,200	Eldorado Valley	Clark	Boulder City, Searchlight
CALIFORNIA (South Lahontan Basin)						
6	30	311	199,000	Ivanpah Valley Groundwater Basin	San Bernardino	Nipton
Sources: Nevada Division of Water Resources 2008a; California Department of Water Resources 2004						

[2] Abbreviated Definitions: VERY HIGH - Areas of the most frequent and concentrated runoff including: well-defined active channels; broad, gravelly, and sparsely vegetated zones of intricate distributary flow networks on active alluvial fans; alluvial fan feeder channels; local trunk drainages; and terminal playas. HIGH - Areas of frequent, concentrated to widespread, relatively unconfined runoff. This class includes: active and intermittently active alluvial fan areas; low channel-bounding terraces; and parts of playa perimeters. MODERATE - Areas of intricately mixed, highly active alluvial surfaces; intermittently active or recently abandoned alluvial surfaces; and dispersed remnants of stable alluvial surfaces too small to map. LOW - Areas of stable alluvial surfaces that have been largely excluded from active alluvial fan processes for more than 5,000 years.

Flood hazard zones are delineated by the FEMA for the purpose of predicting the extent of the 100-year and 500-year flood hazards for insurance and floodplain management purposes. Within the Project area, only a few of the washes crossed by the proposed transmission line route are delineated (Figure 4.8-2, located in Map Volume); however, it is likely that many other washes not yet delineated by FEMA would be subject to flooding. Virtually all of the natural watercourses along the proposed transmission line route and alternatives have flood potential, whether delineated or not. Based on observations made during the field reconnaissance, the waterbody relative flood classes in Table 4-33 appear to provide a conservative estimate of the potential flood, scour (erosion), and debris movement zones. In addition to the washes, the playa lakes are partially flooded during the heaviest rainfall portions of the year and are designated as 100-year flood zones. These are specifically Roach and Ivanpah lakes; portions of the proposed transmission line route and Alternative D are within Ivanpah Lake.

TABLE 4-33
SUMMARY OF RELATIVE POTENTIAL FOR FLOOD, SCOUR, AND DEBRIS MOVEMENT FOR MILEPOST-TO-MILEPOST SEGMENTS ALONG THE PROPOSED ROUTE AND ALTERNATIVE ROUTES A THROUGH E, UNDERGROUND FIBER OPTIC CONDUITS, MICROWAVE TOWER, AND ELDORADO AND IVANPAH SUBSTATIONS

Milepost Numbers		Flood Class Description [Approximate % Low (L), Moderate (M), High (H), Very High (VH)]				Milepost Numbers		Flood Class Description [Approximate % Low (L), Moderate (M), High (H), Very High (VH)]			
Nevada		**L**	**M**	**H**	**VH**	**Nevada**		**L**	**M**	**H**	**VH**
Primary Route						19.87	21.64	14	0	18	68
0	2.33	26	30	4	40	21.64	23.11	6	0	7	87
2.33	4.32	31	0	29	40	23.11	24.59	10	0	15	75
4.32	6.32	0	62	12	26	24.59	26.45	54	0	10	36
6.32	8.18	0	12	9	79	26.45	29.0	72	0	5	23
8.18	10.05	27	38	35	0	*Alternative A*		0	57	0	43
10.05	11.92	92	0	0	8	*Alternative B*		0	53	11	36
11.92	13.91	18	3	17	62	*Alternative C*		19	23	21	37
13.91	15.86	55	0	17	28	*Alternative D*		29	0	0	71
15.86	17.94	9	0	44	47	*Alternative E*		89	0	0	11
17.94	19.87	22	0	39	39	*Eldorado Substation**		NA	NA	NA	NA
California		**L**	**M**	**H**	**VH**	**California**		**L**	**M**	**H**	**VH**
Primary Route						*Ivanpah Substation*		0	0	50	50
29.0	30.26	0	23	30	47	*Underground Conduit Alternative 1*		0	0	40	60
30.26	32.24	0	0	59	41	*Underground Conduit Alternative 2*		0	0	50	50
32.24	34.19	0	0	64	36	*Path2-Section2*		37	38	12	13
34.19	34.56	0	0	12	88	*Microwave Tower*		37	38	12	13

Source: Methodology from House 2006 at NBMG for most Nevada locations. For California and Eldorado Valley-McCullough Mountains, Nevada, values estimated from SCE and Google Earth aerial images (accessed November 2008); and field reconnaissance November 2008. All of Alternatives C and D are included within the Nevada totals. Computed milepost numbers and flood class percentages are not rounded, but should not be considered to have the precision or accuracy of greater than ±10 percent.

*The Eldorado substation is in operation and flood protection is in place.

Groundwater

Groundwater aquifers within the Project area are beneath three desert valleys adjacent to four mountain ranges (Figure 4.8-1, located in Map Volume). From northeast to southwest, the valleys are: (1) Eldorado Valley, (2) unnamed valley between the McCullough and Lucy Gray mountains (herein termed McCullough-Lucy Gray Valley, and (3) Ivanpah Valley; these are within the hydrographic basins shown in Table 4-32. All three of these valleys are underlain by alluvial-basin fill groundwater aquifers contained in unconsolidated deposits of suspected Pliocene through Holocene age. These aquifers receive groundwater recharge through infiltration of runoff from the mountain and alluvial fan slopes, and from direct rainfall. The aquifer system includes coarser-grained aquifer units containing the water and finer-grained confining units retarding vertical and lateral groundwater flow. These groundwater basins are not in overdraft conditions and groundwater is available for the project. Project groundwater requirements have not been fully defined by SCE, but are very minor in relation to available groundwater supplies.

In California the Project area encompasses a portion of the Ivanpah Valley Groundwater Basin (Basin 6-30 [CDWR] 2004) which administratively ends at the Nevada border, but continues northward in the subsurface connecting with the Ivanpah Valley Hydrographic Area (groundwater basin) - Northern Part). To the east, beneath much of the McCullough-Lucy Gray Valley, is the Jean Lake Valley Basin (Basin 165), and farther east (east of the McCullough Mountains) the Eldorado Valley Basin (Basin 167). These hydrographic areas are discussed more fully in Appendix F.

Water Quality

There are no perennial streams or water bodies crossed by the project components. Since Ivanpah Lake, Roach Lake, Jean Lake, and Eldorado Lake are closed basins (internal drainage from the surrounding slopes) surface water runoff can collect on the playa surfaces, and the playa can be recharged if shallow groundwater is present. The proposed transmission line route crosses Ivanpah Lake in California, passes east of Roach Lake, south of Jean Lake, and south of Eldorado Lake in Nevada. As the water collects then evaporates on the playas, salts form and the surface water quality is generally poor. Water quality of surface runoff in streams leading from the mountains to the playas is generally good (NDEP 2008a and 2008c).

Ground water quality in the hydrologic basins in the Mojave Desert in California and Nevada is generally acceptable for most uses of groundwater; however, since many of the basin-fill aquifers have closed surface drainage and limited inter-basin flow, aquifers may contain poor quality saline waters, elements from natural geothermal activity, and contaminants from mining or energy operations.

4.8.3.2 Local Environmental Setting: Proposed Transmission Line Route and Alternatives, Ivanpah Substation, and Telecommunication Components

Proposed Transmission Line Route

The Proposed Project transmission line route has been subdivided into three segments based on the geographic conditions along the route. These are:

- Eldorado Substation to the McCullough Mountains (Mileposts 0.0 to 8.7 and Towers 1 through 61)
- McCullough Mountains (Mileposts 8.7 to 12.0 and Towers 62 to 84)
- McCullough Mountains to the Ivanpah Substation (Mileposts 12.0 to 34.5 and Towers 85 through 237)

Alternative Transmission Line Routes A, B, C, D, and E are described, as well as the proposed and alternative fiber optic conduit routes. A more detailed description for each of the three segments and alternative routes is found in Appendix F for (a) surface drainage, (b) flooding, (c) groundwater, and (d) water quality condition.

Eldorado to McCullough Mountains – Proposed Route

This approximately 8.7-mile northernmost portion of the proposed transmission line route is defined from Tower 1 at the entrance to the Eldorado Substation on the north to Tower 61 on the south (Figure 4.8-1, located in Map Volume). The segment crosses from the axial portion of Eldorado Valley trending southwest, then turns northeast toward the eastern slope of the McCullough Mountains, before turning southwest again along the middle portion of the alluvial fans to a large unnamed drainage emanating from the McCullough Mountains. This segment ends on the southwest where the proposed transmission line route enters the McCullough Mountains bedrock terrain along the south edge of the large unnamed wash.

Surface drainage along this segment is to the east and northeast off of the McCullough Mountains, and consists of typical of the desert washes with intervening younger and older alluvial fan surfaces. The greatest local relief is in the intermediate and older alluvial fans (e.g., Towers 42 through 48). Based on the NBMG flood classification system (Table 4-32), this segment is estimated to be roughly 50-60 percent very high/high hazard and 40 to 50 percent medium/low hazard. Of the 61 towers along this segment it is estimated that 60 to 65 percent are in very high/high hazard areas, with the remaining 35 to 40 percent in low/medium hazard areas.

It is estimated that groundwater is 300 to 350 feet deep (NDEP 2008a) in the lower (axial) portion of the valley (Towers 1-18). No specific groundwater data were found for the higher alluvial fans areas or the large unnamed wash on the southwest. Groundwater in Eldorado Valley is generally considered good quality, with the exception of elevated pH (8.98 standard units [SU]) and iron (1.58 mg/L [NDEP 2008a]).

McCullough Mountains – Proposed Route

The McCullough Mountains segment extends nearly east-west through the McCullough Mountains connecting Eldorado Valley on the east with an unnamed valley on the west that drains north to Jean Lake (Figure 4.8-1, located in Map Volume). The drainage divide between the two valleys is at Tower 79 (Milepost 11.41) nearer the west end of the segment. This is an approximately 3.3-mile-long segment in the central portion of the proposed transmission line route defined from east of Tower 62 westward to Tower 84.

Surface Drainage and Flooding

The narrow relatively steep-walled canyon in this segment is unique along the proposed transmission line route. To the west from the drainage divide, surface water flows along a relatively narrow, moderate to high gradient canyon through bedrock that opens into the unnamed valley near Tower 84. East of the divide, the same type narrow canyon through bedrock extends east southeast to near Tower 75 where the drainage empties into a more typical desert wash, and the route continues within bedrock south of the wash where it remains on a zigzag path to Tower 62; here the route enters the older alluvial fans bordering the unnamed large wash emptying into Eldorado Valley. Based on the NBMG flood classification system (Table 4-32) this segment is estimated to be roughly 85 to 95 percent medium/low hazard. Of the 25 towers along this segment, it is estimated that 5 to 10 percent are in very high/high hazard areas, with remaining 90 to 95 percent in low/medium hazard areas.

Groundwater and Water Quality

Groundwater may be present in fractures in the bedrock formations along this segment of the proposed transmission line route; other wells within bedrock areas east and west of the McCullough Mountains (NDWR 2008 for designated basins 167, 165, and 164A) indicate water less than 100 feet deep in some area. Groundwater quality within the fractured McCullough Mountains segment is likely to be good where water is within bedrock fractures and more granular deposits derived from the crystalline basement, volcanic, and carbonate bedrock formations.

McCullough Mountains to Ivanpah Substation – Proposed Route

This approximately 22.4-mile southwestern-most portion of the proposed transmission line route is defined from north of Tower 85 to Tower 237 at the entrance to the Ivanpah Substation (Figure 4.8-1, located in Map Volume). From the McCullough Mountains, the segment trends west-southwest for about 8.5 miles across young- and intermediate-age alluvial fans to the north end of the Lucy Gray Mountains. Here the route turns southwest into the Ivanpah Valley for approximately 14 miles passing between the Lucy Gray Mountains on the east and Roach Lake (playa) on the west, continuing past Primm to cross Ivanpah Lake and younger alluvial fans bordering the Clark Mountain Range on the east before entering the Ivanpah Substation.

Surface Drainage and Flooding

This is the longest segment of the proposed transmission line route. It extends between Mileposts 12.2 and 34.5 and from Towers 86 through 237 at the entrance to the Ivanpah Substation, and has the most varied hydrology and water quality characteristics. Surface drainage along this segment is to the west and northwest (toward Jean Lake) from the McCullough Mountains; to the north, northwest, west, and southwest (toward Jean, Roach, and Ivanpah lakes) from the Lucy Gray Mountains; and to the east off of the Clark Mountain Range toward Ivanpah Lake. The major portion of the segment crosses typical desert washes with intervening younger and older alluvial fan surfaces, and the remainder crosses (or passes very near to) Roach and Ivanpah lakes, which are dry lakes/playas. Based on the NBMG flood classification system (Table 4-32) this segment is estimated to be roughly 75 to 80 percent very high/high hazard, with the remaining 20 to 25 percent medium/low hazard. Of the 151 towers along this segment it is estimated that 60-65 percent are in very high/high hazard areas and 35-40 percent in low/medium hazard areas.

Groundwater and Water Quality

It is estimated that groundwater is 100 to 350 feet deep in the lower portions of Ivanpah Valley (playa lakes and lower elevation alluvial fans [CDWR 2004]). No specific groundwater data were found for the higher alluvial fans areas or the large unnamed valley draining to Jean Lake. It is expected that water depths in the higher alluvial fans areas would be at least 100 feet based on a review of water wells within the same designated groundwater basin 164A (NDWR 2008). Groundwater in Ivanpah Valley and Eldorado Valley is generally considered marginal to inferior and is high in calcium, sodium, and fluoride (CDWR 2004; NDEP 2008a and 2008c).

Alternative Route A (South and West of Eldorado Substation)

Alternative Route A extends southwest away from the Eldorado Substation subparallel to, and south of, the proposed transmission line Route (between Towers 13 and 50) following an existing transmission line corridor through the Eldorado Valley (Figure 4.8-1, located in Map Volume).

Surface Drainage and Flooding

Surface drainage along the Alternative A segment originates at the large unnamed drainage exiting the McCullough Mountains with flow generally northeast parallel to the route. Drainages are typical of an axial valley area with desert washes and intervening younger alluvial fan surfaces. Based on the application of the NBMG flood classification system (Table 4-32) this segment is estimated to be roughly 40 to 45 percent very high/high hazard, with the remaining 55 to 60 percent medium/low hazard. No preliminary tower locations were provided for Alternative A.

Groundwater and Water Quality

It is estimated that groundwater is 300 to 350 feet deep (NDEP 2008a) in the lower (axial) portion of the valley (Towers 1-18). No specific groundwater data were found for the higher alluvial fans areas or the large unnamed wash on the southwest. Groundwater quality is generally considered good in Eldorado Valley, but would be expected to be somewhat worse in the axial portion of the basin approaching Eldorado Lake where water is exposed to the saline playa/lake bed deposits.

Alternative B (North and West of Eldorado Substation)

Alternative Route B extends northeast away from the proposed transmission line route at Tower 18 for approximately 2.8 miles, then back to the south for about 2.2 miles to the Eldorado Substation (Figure 4.8-1, located in Map Volume).

Surface Drainage and Flooding

The Alternative B route extends northeast from the proposed transmission line route across intermediate and older alluvial fans with surface drainage trending perpendicular to the route flowing from the McCullough Mountains to the southeast. These drainages are typical of the desert washes separated by intermediate and older alluvial fan surfaces. In addition to these smaller washes, the USGS (1989) Sloan SE 7.5-minute quadrangle shows approximately 10 identified intermittent (blueline) stream crossings of the entire alternative route. Based on the NBMG flood classification system (Table 4-32), this segment is estimated to be roughly 45 to 50 percent very high/high hazard, with the remaining 50 to 55 percent medium/low hazard. No preliminary tower locations were provided for Alternative B.

Groundwater and Water Quality

It is estimated that groundwater is 300 to 350 feet deep (NDEP 2008a) in the lower portion of the valley (Towers 1-18). No specific groundwater data were found for the higher alluvial fans areas, but it is expected that water depths would be at least 100 feet in these areas based on a review of water wells within the same designated groundwater basin 167 (NDWR, accessed November 2008). Groundwater in Eldorado Valley is generally considered good. It would be expected that the water quality would be worse in the lower portion of the basin nearer Eldorado Lake where water is exposed to the saline playa/lake bed deposits and better in the alluvial fan areas northeast of Tower 18.

Alternative Route C (West and Southwest of Primm, Nevada)

Alternative Route C begins on the north at approximately Milepost 26.9 (Tower 185) of the proposed transmission line route near the south side of Roach Lake and extends to the west across I-15, then turns south and southwest crossing the low hills bordering the Clark Mountain Range around the north side of Ivanpah Lake. From there, Alternative C turns south-southwest along the west side of Ivanpah Lake and rejoins the proposed transmission line route at Tower 212 (Figure 4.8-1, located in Map Volume).

Surface Drainage and Flooding

Surface drainage along the northern portion of Alternative Route C consists of typical desert washes with intervening younger alluvial fan surfaces (approximately 0.4 mile), and developed/disturbed topography approaching and crossing I-15 (approximately 0.8 mile). From west of I-15, the route enters low bedrock hills for about 0.8 mile before returning to desert washes in younger alluvial fan deposits while roughly paralleling the edge of Ivanpah Lake some 1,000 to 1,500 feet away along an existing road back to the proposed transmission line route. The USGS (1985) Ivanpah 7.5-minute quadrangle shows approximately 21 identified intermittent (blueline) stream crossings along the route (one in the bedrock hills), in addition to numerous other small and intermediate sized washes. Based on the NBMG flood classification system (Table 4-32), this segment is estimated to be roughly 55 to 60 percent very high/high hazard, with the remaining 40 to 45 percent medium/low hazard. No preliminary tower locations were assumed for Alternative C.

Groundwater and Water Quality

It is estimated that groundwater is 100 to 370 feet deep (CDWR 2004; NDWR, accessed November 2008) near Roach and Ivanpah lakes in the lower portion of the valley; at least 100 feet deep in the alluvial fan areas based on a review of water wells within the same designated groundwater basin 164A (NDWR 2008b). Groundwater may be present in the fractured bedrock and layering of the low bedrock hills based on the review of the geology and local water wells. Groundwater in Ivanpah Valley is generally considered marginal to inferior and is high in calcium, sodium, and fluoride (CDWR 2004).

Alternative Routes D and E (South and East of Primm, Nevada)

Alternative Routes D and E are discussed together since Alternative Route E is very short and co-located with Alternative Route D just east of Primm, Nevada. Alternative Route D begins on the north at approximately Milepost 26.79 (between Towers 184 and 185) of the proposed transmission line route, and continues south southwest for about 3.4 miles with a dogleg west to rejoin the proposed transmission line route between Towers 202 and 203 in the central area of Ivanpah Lake. Alternative Route E lies about 0.9 mile east of I-15 and is only 0.5 mile long; it begins on the north very near proposed transmission line route Tower 187 and trends south to intersect Alternative Route D (Figure 4.8-1, located in Map Volume).

Surface Drainage and Flooding

Alternative Routes D and E bypass Primm with Alternative Route D following close to existing unimproved roadways and both alternatives crossing mainly undisturbed natural ground. The portion of the route within Nevada (all of Alternative Route E and about 1.9 miles of Alternative Route D) traverses typical desert washes with intervening younger and intermediate alluvial fan surfaces with only several hundred feet crossing developed/disturbed topography. Drainage flow in this section is from the southeast from the Lucy Gray Mountains nearly perpendicular to the routes and toward the center of Ivanpah Valley and Primm, which sits atop the drainage divide (approximately 2,610 feet elevation) between Ivanpah Lake on the south and Roach Lake on the north. Along this 1.9-mile segment within the USGS (1985) Ivanpah 7.5-minute quadrangle, two identified intermittent (blueline) streams cross the route, in addition to numerous smaller washes. Based on the NBMG flood classification system (Table 4-32), this segment is estimated to be roughly 55 to 60 percent very high/high hazard, with the remaining 40 to 45 percent medium/low hazard. No preliminary tower locations were assumed for Alternative C.

Groundwater and Water Quality

It is estimated that groundwater is 100 to 370 feet deep east of Primm and adjacent to Ivanpah Lake along Alternative Routes D and E (CDWR 2004; NDWR 2008b). Groundwater in Ivanpah Valley is generally considered marginal to inferior and is high in calcium, sodium, and fluoride (CDWR 2004).

Ivanpah Substation

The proposed Ivanpah Substation is located west of Yates Well and I-15 on younger alluvial fans, and across young desert washes originating in the Clark Mountain Range on the west.

Surface Drainage and Flooding

Surface drainage at the Ivanpah Substation is flowing to the east and east-northeast from the Clark Mountain Ranges, and consists of typical desert washes with intervening younger alluvial fan surfaces. Based on the NBMG flood classification system (Table 4-32) the substation site is estimated to be 100 percent very high/high hazard.

Groundwater and Water Quality

It is estimated that groundwater is 100 to 370 feet deep (CDWR 2004), although no specific groundwater data were found for this area. Groundwater in Ivanpah Valley is generally considered marginal to inferior, with high calcium, sodium, and fluoride contents (CDWR 2004).

4.8.3.4 Telecommunication System-Underground Fiber Optic Cable Conduit Routes (West and East of Nipton, and North and South of Ivanpah Substation) and Microwave Tower

Underground fiber optic cable will be deployed in conduits in concert with aboveground lines as a part of the telecommunication system designed to afford special protection to the system under specific outage contingencies and to provide operational and monitoring capability. Underground conduit lines and a microwave tower are considered in this section.

The Path 2-Section 3 is from the town of Nipton to the Ivanpah Substation. It has a preferred route (Section 3A-microwave towers) and two alternates (partially underground conduits). Path 2-Section 3-Alternates 1 and 2 share the same route west from the town of Nipton to I-15, with the first mile aboveground and the next 9 miles underground. From the I-15 and Nipton Road junction point, Alternatives 1 and 2 take divergent routes aboveground along existing Nipton 33kV distribution lines to the Ivanpah Substation, except the last mile of each would be underground conduit entering the Ivanpah Substation. Alternative 1 enters from the south and Alternative 2 enters from the north. The 180-foot-high microwave communication tower would be located approximately 0.4-mile northeast of the town of Nipton and would be about 100 feet by 100 feet. An aboveground power distribution line and the aboveground Section 2 fiber optic cable would be extended overland from the town of Nipton to this microwave tower site.

The Path 2-Section 2 underground conduits will connect to Path 2-Section 1 Eldorado-Lugo aboveground lines from the town of Nipton running about 4.8 miles east next to the north side of Nipton Road (Highway 164). A more detailed description for both of the underground conduit locations of the (a) surface water and flooding, (b) groundwater, and (c) water quality is found in Appendix F.

4.8.4 <u>Environmental Impacts and Mitigation Measures</u>

This section presents discussion of impacts and mitigation measures for the Proposed Project (220kV) Transmission Line Route, the Ivanpah Substation, and the proposed Telecommunication System underground fiber optic conduit routes and microwave tower for the Eldorado-Ivanpah Project. The discussion begins with a summary of potential impacts (Section 4.8.4.1). Sections 4.8.4.2 through 4.8.4.4 provide a discussion of the level of potential impacts and applicability of mitigation measures, organized by construction and operations, for the proposed transmission line route, the Ivanpah Substation, and the proposed alternative underground fiber optic conduit routes.

4.8.4.1 Impact Summary

Hydrology and water resources impacts would be considered significant if the Proposed Project fulfills the CEQA impact statements listed below. Incorporating the APMs described in Table 4-31 would ensure compliance with existing water quality regulations, as well as integration of design features and standard operating procedures that prevent most potentially significant impacts. Potential hydrology impacts are summarized below. They are described in detail for the transmission line and alternatives, for Ivanpah Substation, and for the underground conduit locations and microwaver tower site, along with applicable mitigation measures, in Appendix F.

1. Violate any water quality standards or waste discharge requirements?

<u>Construction and Operational Impacts</u>

SCE would incorporate several APMs to ensure compliance with existing water quality standards and waste discharge requirements. As a result, no impacts are anticipated.

2. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

Construction Impacts

During construction, the project may use local groundwater resources for dust control (the Dust Control Plan is described in Section 4.3 Air Quality) and other construction related activities. At the present time SCE has not estimated the quantities of water required for the project. However, the amounts would be small relative to the capacity of local groundwater basins and temporary in nature; thus, this water usage would not substantially deplete groundwater supplies. Construction activities would not interfere with groundwater recharge. Therefore, this potential impact would be less than significant.

Operational Impacts

The Proposed Project would use minimal groundwater (e.g., for routine line washing, toilet flushes, drinking water at the substation), and so would not deplete groundwater supplies. SCE has not estimated the quantities of water required for project operations. However, the amounts would be small relative to the capacity of local groundwater basins; thus, this water usage would not substantially deplete groundwater supplies. The amount of future impermeable area created at the substation site would be small and would not substantially affect regional groundwater recharge. As a result, no impacts are anticipated.

3. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on-site or off-site?

Construction Impacts

Construction activities are temporary in nature and should not substantially alter the existing drainage pattern of the substation and microwave tower sites or the general or project area, or the course of a stream or river, in a manner that could result in substantial erosion or siltation on-site or off-site. Therefore, no impacts are anticipated.

Operational Impacts

Operational activities associated with inspection and maintenance of transmission structures should not substantially alter the existing drainage pattern of specific sites or the Project area, or the course of a stream or river, in a manner that would result in substantial erosion or siltation on-site or off-site. Therefore, no impacts are anticipated.

The Bright Source LLC Surface Water Management Plan will encompass the area of the substation and SCE will integrate its surface water management into the Bright Source LLC-approved plan. The substation would alter existing drainage patterns of the site, including a stream course, in a manner that could result in off-site erosion or siltation. However, incorporating energy dissipation structures into the project design would prevent substantial erosion or siltation on-site or off-site. Therefore, no impacts are anticipated.

4. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-site or off-site?

Construction Impacts

Construction activities are temporary in nature and should not substantially alter the existing drainage pattern of the site or area, the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-site or off-site. Therefore, no impacts are anticipated.

Operational Impacts

Operational activities associated with inspection and maintenance of transmission structures or the microwave tower should not substantially alter the existing drainage pattern of the site or area, the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-site or off-site. Therefore, no impacts are anticipated.

The Ivanpah Substation would substantially alter the existing drainage pattern of the site, including the course of local streams, and potentially increase the rate or amount of surface runoff in a manner that could result in flooding on-site or off-site. Therefore, without mitigation potentially significant impacts may occur. With mitigation (see Section 4.8.2.2), this potential impact is considered less than significant.

5. Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?

Construction Impacts

There are no existing storm water drainage systems in the Project area. Therefore, construction activities would not create or contribute to runoff water that would exceed the capacity of existing drainage systems. Incorporating SCE’s APMs as an integral part of the Project would ensure compliance with existing regulations, and thus, construction activities would not provide substantial additional sources of polluted runoff. Therefore, no impacts are anticipated.

Operational Impacts

Operational activities associated with the transmission or microwaver tower structures would not create or contribute to runoff water that would exceed the capacity of planned storm water drainage systems or provide substantial additional sources of polluted runoff. Therefore, no impacts are anticipated.

Operation of the Ivanpah Substation would redirect stormwater during flash floods, and could create or contribute to runoff water that might exceed the capacity of planned storm water drainage systems. If this occurred, a potentially significant impact could result. With mitigation (see Section 4.8.2.2), this potential impact is considered less than significant.

Operation of the Ivanpah Substation would not provide substantial additional sources of polluted runoff. SCE's APMs ensure compliance with existing regulations, and therefore, no impacts are anticipated.

6. Otherwise substantially degrade water quality?

Construction and Operational Impacts

Through incorporation of APMs, SCE would comply with all applicable water quality regulations. Therefore, neither construction activities nor project operations would otherwise substantially degrade water quality, and no impacts are anticipated.

7. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

Housing is not a component of the Proposed Project, and therefore, no impacts would occur.

8. Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

Construction Impacts

During construction, equipment would operate in a FEMA designated 100-year flood hazard area (Ivanpah Dry Lake). It is unlikely that construction activities would impede or redirect flood flows within the dry lake during a major storm event. Therefore, no impacts are anticipated.

Operational Impacts

Some transmission structures would be placed with a FEMA designated 100-year flood hazard area (Ivanpah Dry Lake). These structures would not impede or redirect flood flows, and therefore, no impacts are anticipated.

9. Expose people or structures to a significant risk of loss, injury, or death involving flooding including flooding as a result of the failure of a levee or dam?

<u>Construction Impacts</u>

During construction, workers could be subjected to potential risks associated with flash flooding in the desert during infrequent major storms. They would not be subjected to flooding as a result of levee or dam failure. Due to the very low probability of occurrence, this potential impact is considered less than significant.

<u>Operational Impacts</u>

Transmission line structures and the substation could be exposed to flooding hazards. Transmission line structures and foundations are designed to withstand localized inundation. It is unlikely that transmission line structures would be damaged, and therefore, this impact would be less than significant.

The substation could be exposed to flooding during a major storm event if the proposed berm is damaged by erosion or insufficient in size to withstand a localized stormwater runoff during a major storm. Without mitigation, flooding of the substation could be a potentially significant impact. With mitigation, this potential impact is considered less than significant.

10. Inundation by seiche, tsunami, or mudflow?

<u>Construction and Operational Impacts</u>

There are no large lakes with standing water in the project area. Ivanpah Lake would rarely contain substantial water (depths capable of sustaining a seiche). The probability of a major seismic event occurring while the lake has water depths capable of generating a seiche is an extremely unlikely event. Therefore, this potential impact is less than significant for all Project components.

The Project area is located along the California-Nevada border, several hundred miles from the Pacific Ocean. As a result, no tsunami hazard is present and there is no impact associated with a tsunami.

Due to the geologic conditions (rock type and sediments with minimal clay content) within the Project area, mudflows are unlikely. Therefore, this potential impact is less than significant.

4.8.4.2 Impact Significance after Mitigation Measures

The potential impacts due to hydrology and water quality associated with construction and operation of the Proposed Project are considered to be less than significant. The aforementioned APMs have been incorporated into Project construction activities. Considering the APMs, potential significant hydrology and water quality impacts associated with construction and operation of the Proposed Project have been avoided or reduced to less-than-significant levels. No further mitigation is required.

4.8.5 Evaluation and Comparison of Proposed Route and Alternatives

4.8.5.1 No Project/No Action Alternative

The No Project Alternative is defined in Section 2.4.3. The No Project Alternative includes the assumption that existing transmission lines, substations, and power plants would continue to operate. The effects that these facilities cause on the existing environment would not change, so no new impacts would occur from continuing operation of the existing transmission lines, substations, and power plants. Also, under the No Project Alternative, the proposed Eldorado-Ivanpah project would not be constructed, so the impacts associated with construction and operation of the project would not occur. These potential impacts avoided would include: water quality degradation through erosion and sedimentation, excavation, and hazardous materials spills; increased runoff and erosion; diversion of surface water; and encroachment of Project structures into desert washes and floodplains.

The first component of the No Project Alternative is the continuation of ongoing demand-side actions, including energy conservation and distributed generation. These actions would result in limited or no impacts to hydrology and water quality.

The second component of the No Project Alternative is the continuation of supply-side actions, resulting in potentially increased generation within California and Nevada and/or increased transmission within and into California and Nevada to serve anticipated growth in electricity consumption. The impacts of other new power plants and other new transmission lines to hydrology and water quality should be approximately the same, depending on the locations of the projects, as those that would occur under the Proposed Project.

4.8.5.2 Comparison of the Proposed Project Transmission Line Route to Alternative Routes and of Underground Fiber Optic Conduit Alternatives

Table 4-34 provides a comparison of the Proposed Project transmission line route with the Alternative Routes A through E and of the Underground Fiber Optic Cable Conduit Path 2-Section 3-Alternatives 1 and 2, Path 2-Section 2, and the microwave tower site using hydrology and water quality factors. These factors are discussed for each location in the Environmental Setting section. Further discussion in Appendix F provides additional information regarding the determination of the superior alternatives. Alternative E is compared to the northern 4,300 feet of Alternative D, which is the section of Alternative D that would be replaced by Alternative E. In the other cases, the tower numbers for the proposed transmission line route that would be replaced by Alternatives A through D are shown.

TABLE 4-34
COMPARISON OF THE PROPOSED TRANSMISSION LINE ROUTE WITH THE ALTERNATIVE ROUTES A THROUGH E AND OF THE UNDERGROUND FIBER OPTIC CABLE CONDUIT PATH 2-SECTION 2-ALTERNATIVES 1 AND 2 USING HYDROLOGY AND WATER QUALITY FACTORS

Transmission Lines	Proposed Route	Alt. A	Proposed Route	Alt B	Proposed Route	Alt C	Proposed Route	Alt D	Proposed Route	Alt E
Tower Numbers →	13 to 50	--	1 to 20	--	185 to 218	--	184 to 203	--	4,300 feet of D	--
Comparison Factors [1]										
Surface Drainage and Flooding										
Est. Flood Risk (%)										
Low	15	0	25	0	25	19	35	29	90	89
Medium	25	57	30	53	10	28	10	0	0	0
High	15	0	5	11	30	21	20	0	0	0
Very High	45	43	40	36	35	37	35	71	10	11
Number of Intermittent Stream Crossings	7 [2]	9	9	10		21	1	2	2	2
Range of Local Relief (Feet)	0.5-4	0.5-2	0.5-2	0.5-4	0.5-1	0.5-2 [3]	0.5-2	0.5-2	0.5-2	0.5-2
Groundwater Depth (Feet)	100-350	100-350	100-350	100-350	100-370	100-370	100-370	100-370	100-370	100-370
Water Quality	Good	Good	Good	Good	Poor	Poor	Poor	Poor	Poor	Poor
Superior Transmission Line Route		***X***	***X***		***X***		***X***		***X***	***X***

Fiber Optic Conduits	Path 2-Section 3-Alternative 1 South of Ivanpah Sub.	Path 2-Section 3-Alternative 2 North of Ivanpah Sub.
Comparison Factors [1]		
Surface Drainage and Flooding		
Est. Flood Risk (%)		
Low	0	0
Medium	0	0
High	40	50
Very High	60	50
Number of Intermittent Stream Crossings	5	6
Range of Local Relief (Feet)	2-4	2-4
Groundwater Depth (Feet)	>100	>100
Water Quality	Likely to be Good	Likely to be Good

1. The factors used in the comparison are discussed in the Environmental Setting section.
2. Proposed Transmission Line Route Towers 50 to 30 are largely within the flow path of desert washes draining from the west.
3. In the low bedrock hills there is local relief of 110± feet or less for about 15% of Alternative C.

TABLE 4-34
COMPARISON OF THE PROPOSED TRANSMISSION LINE ROUTE WITH THE ALTERNATIVE ROUTES A THROUGH E AND OF THE UNDERGROUND FIBER OPTIC CABLE CONDUIT PATH 2-SECTION 2-ALTERNATIVES 1 AND 2 USING HYDROLOGY AND WATER QUALITY FACTORS

Transmission Lines	Proposed Route	Alt. A	Proposed Route	Alt B	Proposed Route	Alt C	Proposed Route	Alt D	Proposed Route	Alt E
Superior Fiber Optic Conduit Route	*X*									

4.8.6 References

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U.S. Geological Survey (USGS). 1985. Roach and Ivanpah Lake 7.5-Minute Topographic Quadrangles, accessed with TOPO! 2007

_____. 1989. Hidden Valley, McCullough Pass, and Sloan SE 7.5-Minute Topographic Quadrangles, accessed with TOPO! 2007.

4.9 LAND USE AND PLANNING

This section includes a discussion of the existing and planned land uses within the vicinity of the Proposed Project, consistency with applicable land use policies and regulations, and the potential impacts to land use. Although the Proposed Project is exempt from local land use and zoning requirements in California, SCE has considered local and state land use and zoning regulations and permitting as part of the current environmental review and design process.

4.9.1 Regulatory Setting

4.9.1.1 Federal

Wilderness Act of 1964

In order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition, it is hereby declared to be the policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness. For this purpose there is hereby established a National Wilderness Preservation System to be composed of federally owned areas designated by Congress as “wilderness areas,” and these shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness; and no Federal lands shall be designated as "wilderness areas" except as provided for in this Act or by a subsequent Act.

Department of Interior, Bureau of Land Management

The BLM has exclusive jurisdiction of ROWs on public lands in the project area. SCE submitted an application on April 9, 2008 to the BLM to amend the existing ROW authorization 1419729 “F” ECD. Because construction and operation of the Proposed Project would require an amendment(s) to the existing ROWs grants on BLM land, the BLM must review the application for the ROW and provide a review consistent with the FLPMA and the NEPA. The BLM would make a determination regarding consistency with the land use and management plans of the BLM’s California Desert District – Needles Field Office and the Southern Nevada District – Las Vegas Field Office. The following plans were reviewed:

- The California Desert Conservation Area Plan and Final Environmental Impact Statement (U.S. BLM 1980, 1999).
- The Proposed Northern and Eastern Mojave Desert Management Plan (BLM 2002 Amendment to the California Desert Conservation Area Plan and Final Environmental Impact Statement)
- Proposed Las Vegas RMP and Final Environmental Impact Statement (U.S. BLM 1998)
- Record of Decision for the Approved Las Vegas RMP and Final Environmental Impact Statement (U.S. BLM 1998)

SCE has requested that the BLM amend the existing ROW grants for portions of the proposed 220kV Transmission Line and Telecommunications Facilities that would be located on BLM land outside of existing ROWs. 34.7 miles of a new ROW would be required for the proposed Transmission Line. Alternative Route A would require 5.0 miles and Alternative Route B would require 5.6 miles. Alternative Route C would require a new ROW around Ivanpah Lake for approximately 5.2 miles. Alternative D would require 3.2 miles and Alternative E would require 0.7 miles, respectively, of new ROWs. The Telecommunications Facilities would require new ROWs for new transmission line alternatives. In compliance with NEPA and FLPMA, the BLM could approve the ROW grant amendment based on either a Categorical Exclusion or a Finding of No Significant Impact issued after preparation of an appropriate environmental document, such as an Environmental Assessment or Environmental Impact Statement.

Mojave National Preserve

The Mojave National Preserve (Preserve) was established by the California Desert Protection Act (Act) in 1994. The following provisions of Section 511 of the Act, Utility ROWs, are applicable to the Proposed Project.

> (a)(1) Nothing in this title shall have the effect of terminating any validly issued ROW or customary operation, maintenance, repair, and replacement activities in such ROW, issued, granted, or permitted to Southern California Edison Company, its successors or assigns, which is located on lands included in the Mojave National Preserve, but outside lands designated as wilderness under Section 601(a)(3). Such activities shall be conducted in a manner which will minimize the impact on preserve resources.
>
> (2) Nothing in this title shall have the effect of prohibiting the upgrading of an existing electrical transmission line for the purpose of increasing the capacity of such transmission line in the Southern California Edison Company validly issued Eldorado-Lugo transmission

line ROW and Mojave-Lugo transmission line ROW, or in a ROW if issued, granted, or permitted by the Secretary adjacent to the existing Mojave-Lugo transmission line ROW (hereafter in this section referred to as “adjacent ROW”), including construction of a replacement transmission line: provided that—

(A) in the Eldorado-Lugo transmission line ROWs (hereafter in this section referred to as the "Eldorado ROWs") at no time shall there be more than three electrical transmission lines

(C) if there are no more than two electrical transmission lines in the Eldorado ROWs, two electrical transmission lines in the lands encompassed by the Mojave ROW and adjacent ROW may be allowed

(D) in the Eldorado ROWs and Mojave ROW no additional land shall be issued, granted, or permitted for such upgrade unless an addition would reduce the impacts to preserve resources

Federal Aviation Administration

FAA regulations address potential aircraft obstruction for structures taller than 200 feet or within 20,000 feet of an airport. Specifically, Federal Regulation Title 14, Part 77, establishes standards and notification requirements for objects that have the potential to affect navigable airspace. These standards are intended to (1) evaluate the effect of the construction or alteration of structures on airport operating procedures; (2) determine if there is a potential hazard to air navigation; and (3) identify measures to enhance safety. Specifically, the FAA requires notification through the filing of FAA Form 7460, Notice of Proposed Construction or Alteration, if any of the following criteria are met with regards to a proposed action (Title 14, Part 77.13):

- any construction or alteration of more than 200 feet in height
- any construction or alteration of greater height than an imaginary surface extending outward and upward at one of the following slopes:
  - 100 to 1 for a horizontal distance of 20,000 feet from the nearest point of the nearest runway of each airport, with at least one runway more than 3,200 feet in actual length, excluding heliports
  - 50 to 1 for a horizontal distance of 10,000 feet from the nearest point of the nearest runway of each airport specified with its longest runway no more than 3,200 feet in actual length, excluding heliports
  - 25 to 1 for a horizontal distance of 5,000 feet from the nearest point of the nearest landing and takeoff area of each heliport
- any highway, railroad, or other traverse way whose prescribed adjusted height would exceed the standards presented above
- when requested by the FAA
- any construction or alteration located on a public use airport or heliport regardless of height or location

Habitat Conservation Plan/Natural Communities Conservation Plan

Conservation and protection standards and policy outlined in the HCP/NCCP are prepared through the collaborative effort of cities, counties, state, and federal agencies having jurisdiction over lands within a region. SCE has considered the HCP/NCCP as part of the current land use/environmental review process. The following Conservation Plans pertain to the Proposed Project area:

- The California Desert Conservation Area Plan and Final Environmental Impact Statement (U.S. BLM 1980, 1999). This Habitat Conservation Plan and federal land use plan (1) presents a comprehensive strategy to conserve and protect sensitive plants and animals and the natural communities of which they are a part, and (2) provides a streamlined program for complying with the requirements of the California and Federal Endangered Species Acts (CESA and FESA, respectively). According to the CDCA Plan, utility needs which do not conform to the adopted corridor system will be processed by means of a Plan Amendment in conjunction with necessary permit hearings required by other agencies.

- The Proposed Northern and Eastern Mojave Desert Management Plan (BLM 2002 Amendment to the California Desert Conservation Area Plan and Final Environmental Impact Statement). This land use plan amendment, approved in 2002, presents a comprehensive strategy to conserve and protect sensitive plants and animals and the natural communities of which they are a part, and provides a streamlined program for CESA and FESA compliance.

- The Final Clark County Multiple Species Habitat Conservation Plan and Environmental Impact Statement (Clark County 2000). This Habitat Conservation Plan and federal land use plan (1) presents a comprehensive strategy to conserve and protect sensitive plants and animals and the natural communities of which they are a part, and (2) provides a streamlined program for complying with the local and federal requirements.

4.9.1.2 State

California Public Utilities Commission General Order 131-D (California)

CPUC's review of transmission line applications takes place under two concurrent and parallel processes:

(1) environmental review pursuant to the CEQA

(2) review of project needs and costs pursuant to Public Utilities Code Sections 1001 et seq. and General Order 131-D

CPUC General Order 131-D: "Rules relating to the planning and construction of electric generation, transmission/power/distribution line facilities and substations located in California" - states that no electric public utility shall begin construction in the state of California of any new electric generating plant, or of the modification, alteration, or addition to an existing electric generating plant, or of electric transmission/power/distribution line facilities, or of new, upgraded or modified substations without first complying with the provisions of this General Order. For purposes of this General Order, a transmission line is a line designed to operate at or above 200kV. A power line is a line designed to operate between 50 and 200kV. A distribution line is a line designed to operate under 50kV. More information on General Order 131-D requirements can be found in Attachment A, General Order 131-D Checklist.

Public Utilities Commission of Nevada

The construction of a utility facility, defined as a transmission line that is 200kV or more, requires a permit by the Public Utilities Commission of Nevada under the UEPA according to the NRS 704.820 through 704.900. However, the replacement of an existing facility with a like facility, as determined by the Commission, does not constitute construction of a utility facility (NRS 704.865).

4.9.1.3 Local

Land Use and Zoning

The Proposed Project is exempt from local land use and zoning regulations in California. However, because SCE is complying with CPUC regulations governing transmission lines, CPUC General Order No. 131-D, Section XIV. B requires the utility to consult with local agencies regarding land use matters. SCE has considered local and state land-use plans as part of the current environmental review process. The following local plans were reviewed:

- County of San Bernardino 2007 General Plan: outlines standards and policy for unincorporated territory within San Bernardino County, California (County of San Bernardino 2007)
- Clark County Comprehensive Plan: outlines standards and policy for unincorporated territory within Clark County, Nevada (County of Clark 2008)
- Boulder City Master Plan: includes goals, policies, and programs used in making land use decisions for the future of the City of Boulder City, Nevada (City of Boulder City 2003)

Airport Land Use Plans: South (Clark) County, Nevada Interstate 15 Corridor Plan

Any project proposed to be located in the South County must be compatible with the South County Land Use Plan. The Clark County Planning Department most recently updated this plan in December 2005, with the South County Interstate 15 Corridor Plan (I-15 Plan), in response to CCDOA Proposed Action. This plan documents the land use goals and policies implemented by Clark County in order to provide practical solutions to facilitate the development of the Ivanpah Airport and to mitigate impacts that result from the construction and operation of the airport. The I-15 Plan identifies specific policies, including:

- controlling any aesthetic and/or visual impacts caused by any type of proposed or expanded development

- proper screening and buffering of any proposed development within the I-15 Corridor in accordance with Title 30 Clark County Unified Development Code, Section 30.64, Site Landscape and Screening Standards; waivers to these standards should not be granted to any project within the I-15 Corridor
- discouragement of any development within the Ivanpah Airport Noise Compatibility Area that is in conflict with the uses planned for the airport
- exclusion of residential uses from the Ivanpah Airport Noise Compatibility Area

The development of the Ivanpah Airport is to be located in the Ivanpah Cooperative Management Area (Figure 4.9-2, located in Map Volume). The Cooperative Management Area is defined in the Clark County Conservation of Public Land and Natural Resources Act of 2002 (Public Law 107-282, Section 501) as an administrative withdrawal.

4.9.2 Significance Criteria and Approach to Impact Assessment

4.9.2.1 Significance Criteria

Impacts to land use and planning are considered potentially significant if the project would:

- physically divide an established community
- conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect
- conflict with any applicable habitat conservation plan or natural community conservation plan

4.9.2.2 Applicant Proposed Measures

SCE proposes the following APM with respect to aeronautical considerations for the proposed Eldorado-Ivanpah 220kV Transmission Line and Telecommunication System:

LU-1. Aeronautical Considerations. SCE would submit notice to the FAA electronically, in accordance with FAA procedures and as far in advance of construction as possible.

No further APMs are proposed for land use and planning.

4.9.2.3 Approach to Impact Assessment

The assessment of potential impacts to existing and planned land uses was conducted to address the CEQA significance criteria. The assessment was based on the potential impact of the Proposed Project on existing and planned land uses. The Project's consistency with applicable land use plans was also considered in the assessment. The impact assessment was conducted to identify the type and extent of impacts to land uses affected by the Proposed Project. Impacts were evaluated within a study area defined to be a radius of approximately 0.5 mile of the Proposed Project facilities.

4.9.3 Environmental Setting

The environmental setting section includes a description of the existing and planned land uses in the study area for the Proposed Project. Information was obtained directly from maps and the interpretation of aerial photographs, and from secondary sources including agency plans and other documents.

4.9.3.1 Regional Setting

As shown in Figures 4.9-1 and 4.9-2 (located in Map Volume), the proposed Eldorado-Ivanpah Transmission Project is located in San Bernardino County, California and Clark County, Nevada. The majority of the Proposed Project area is under federal jurisdiction, managed by the BLM. The general area, within the Mojave Desert, is composed of open lands with an assemblage of mountain ranges interspersed with valleys that contain dry lakes. Within San Bernardino County, California, the proposed Telecommunications Facilities pass along the unincorporated areas of Mountain Pass, Nipton, and Wheaton Springs. In Clark County, Nevada, the unincorporated area of Primm is crossed by the proposed transmission line project. Boulder City, Nevada is the only incorporated community within the study area. In the Nevada portion of the study area, other unincorporated communities include Goodsprings, Jean, Ripley (Sandy Valley), and Searchlight.

For the purpose of the land use analysis, impacts were evaluated within an approximate 0.5-mile radius surrounding the proposed and alternative 220kV Transmission Line routes, Substations and Telecommunications Facilities. Primary existing land uses within the Project vicinity include open space, conservation/preserve, commercial, public and private recreation, utility/energy, industrial, mining, transportation, and limited residential. Designated uses in the surrounding area include the Mojave National Preserve (Preserve), wilderness areas, ACECs, utility corridors, and the Ivanpah Cooperative Management Area. The only known existing residential use in the study area is in Primm, Nevada (see 4.9.3.2 Local Setting). There are no schools, churches, or hospitals located within 0.5 mile of the Project. Currently, there is an airport and a proposed airport that is further discussed in this section.

Mojave National Preserve

The Preserve was established to protect resources and provide recreation opportunities, although some grazing and mining leases remain active. Limited hunting is allowed under California state regulations. As the third largest NPS unit outside of Alaska, the Preserve encompasses 1.5 million acres, including the Mojave Wilderness.

The Mojave National Preserve is in San Bernardino County. It is generally located south of the Nipton 33kV transmission line, although it extends to other regions that are not within the 0.5-mile radius. As shown on Figures 4.9-1 and 4.9-2 (located in Map Volume), the Nipton 33kV power line ROW forms the northern boundary of the Preserve for about 7.0 miles west of Nipton, and crosses through the Preserve for about 4.0 miles east of Wheaton Springs. The Eldorado-Lugo 500kV transmission line crosses the California-Nevada border into the Preserve, forming the northwest boundary of the Mojave Wilderness for about 3.5 miles.

The “Mojave National Preserve General Management Plan” includes prescribed uses for the Preserve (2002 NPS). As described in the plan, the Existing Land Use and the Desired Future Conditions for the areas adjacent to the Proposed Project ROW include wilderness (in the designated Mojave Wilderness Area), and the remaining area is identified as natural environment and tortoise habitat.

Mojave Wilderness Area

Designated in 1994, the Mojave Wilderness now has a total of 695,200 acres. It is located southeast of the unincorporated area of Nipton in San Bernardino County. The entire wilderness is within The Mojave National Preserve California and is managed by the NPS.

Wee Thump Joshua Tree Wilderness Area

The Wee Thump Joshua Tree Wilderness was designated in 2002 and has a total of 6,050 acres. This Wilderness Area is approximately 11.0 miles south of the Boulder City Annexation and abuts the east side of the Eldorado-Lugo 500kV transmission line. All of the wilderness is in Nevada and is managed by the BLM-Las Vegas Field Office.

Crescent Townsite Area of Critical Environmental Concern

The Crescent Townsite ACEC, managed by the Las Vegas BLM, is 437 acres in size and located in Clark County, Nevada. Located 1.5 miles east of the state line and south of State Route (SR) 164/Nipton Road, this is an area of particular value due to its historic railroad construction and mining.

Piute/Eldorado Area of Critical Environmental Concern

The Piute/Eldorado ACEC, managed by the Las Vegas BLM, contains 329,440 acres and is located in Clark County, Nevada. This ACEC is south of the Boulder City Annexation and extends west to the state line. These lands contain critical tortoise habitat.

Clark Mountain Area of Critical Environmental Concern

The Clark Mountain ACEC, managed by the Needles BLM, contains 4,234 acres and is located in San Bernardino County, California. Located north and west of the Mountain Pass Substation, this is an area of prehistoric and historic values, outstanding scenery, and wildlife habitat.

Ivanpah Desert Wildlife Management Area - Area of Critical Environmental Concern

The Ivanpah Desert Wildlife Management Area-Area of Critical Environmental Concern, managed by the Needles BLM, contains 36,795 acres and is located in San Bernardino County, California. It is north of Nipton Road and east of the I-15, and includes sensitive lands due to critical tortoise habitat.

Designated Utility Corridors

As shown in Figure 4.9-2 (located in Map Volume), in Nevada, the Eldorado-Lugo Line is located within a designated utility corridor in the Boulder City Annexation. The remaining portions of the proposed transmission line would not be within a BLM Utility Corridor, between the Boulder City boundary and the state line (BLM 1998). Within Nevada, the proposed Transmission Line and alternatives lie primarily within BLM and Boulder City designated utility corridor.

The BLM-California Desert District has designated utility corridors in the Eldorado-Ivanpah Transmission Project Area of California. Utility Corridor *BB* is 1-mile wide and contains the I-15. Utility Corridor *BB-D* is also 1-mile-wide and connects to corridor *BB.* Corridor *BB-D* contains the proposed transmission line route, the line from the proposed Ivanpah Substation to Mountain Pass Substation, and continues to I-15, south of the Mountain Pass Substation. Additionally, the segment of the Nipton 33kV between the proposed transmission line route and the I-15 is within Corridor *BB-D*. East of the I-15 (Utility Corridor BB) within California, none of the proposed routes are within any designated or utility corridors.

Ivanpah Cooperative Management Area

In order to accommodate South Clark County's growth, a new ordinance was adopted in 2003 to implement master plans. The South County I-15 Corridor Plan was a component of the 2005 Land Use Plan Update. This Update includes the Cooperative Management Area (CMA) Design Overlay District for a future Ivanpah Valley Airport.

Unincorporated Area of Primm

The unincorporated area of Primm has three resorts: Buffalo Bill's Resort and Casino, capacity 1,200 rooms; Whiskey Pete's, capacity 700 rooms; and Primm Valley Casino Resort, capacity 679 rooms. An outlet mall (Fashion Outlet of Las Vegas) is connected to the Primm Resort. A multi-family residential complex is located on the east side of Primm and is used primarily for casino/resort employee housing. A mobile home park is located east of the multi-family complex. The Bighorn Electric Generating Station is a 700-MW, natural gas combined-cycle power plant, located about 1 mile east of the mobile home park, owned by Reliant Energy Bighorn, LLC.

Mining Claims

The BLM's Land and Mineral System, LR2000, is the BLM's tracking system for mining claims (BLM LR2000 2008). The township, range, and section were reviewed for all sections that contain a portion of the proposed or alternative 220kV Transmission Line route or the

Telecommunication System. Within each section listed below, there is one or more mining claim which would be crossed by the proposed and alternative Project routes.

220kV Transmission Line:

Proposed Route

- Township 25 South, Range 60 East, Section 33
- Township 25 South, Range 60 East, Section 34
- Township 25 South, Range 61 East, Section 20
- Township 25 South, Range 61 East, Section 21
- Township 25 South, Range 61 East, Section 22
- Township 26 South, Range 59 East, Section 13
- Township 26 South, Range 60 East, Section 4
- Township 26 South, Range 60 East, Section 5

Alternative C

- Township 27 South, Range 59 East, Section 7

Telecommunication System:

Nipton 33kV

- Township 16 North, Range 13 East, Section 2
- Township 16 North, Range 13 East, Section 11
- Township 16 North, Range 14 East, Section 23
- Township 16 North, Range 14 East, Section 31
- Township 16 North, Range 14 East, Section 32
- Township 16 North, Range 15 East, Section 21

4.9.3.2 Local Setting

Refer to Figures 4.9-1 and 4.9-2 (located in Map Volume) regarding local setting.

<u>Transmission Line (Eldorado-Ivanpah 220kV Line)</u>

Proposed Transmission Line Route

The proposed Eldorado-Ivanpah 220kV Transmission Line would include the replacement of approximately 35.0 miles of existing single-circuit 115kV transmission line with new, higher capacity double-circuit 220kV transmission lines, as well as the replacement of support structures primarily within existing SCE ROWs and laydown areas locations between the existing Eldorado Substation (Nevada) and the proposed Ivanpah Substation (California). Five existing transmission lines (Eldorado-McCullough 500kV, Mead-Victorville 287kV, McCullough-Victorville 1 500kV, McCullough-Victorville 2 500kV, and Intermountain-Adelanto 500kV Direct Current) are located within SCE's existing ROW.

Starting at the Eldorado Substation, the proposed transmission line route generally heads southwest through the Boulder City Annexation for 6.0 miles. The existing land use is open desert with McCullough Range Mountains parallel to the route. As indicated in the Boulder City General Plan (2003), land use designations include Utility, Energy, and Preserve. The proposed transmission line would primarily be located in the Boulder City designated utility corridor. The route continues generally southwest, passing through BLM land until reaching the north side of Primm. The segment from Boulder City to Primm borders and enters the Cooperative Management Area (CMA), borders the eastern edge of Roach Lake, and then crosses the UPRR outside the eastern boundary of Primm. The proposed route, at the nearest distance, would be approximately 4.5 miles south of the Jean Airport, and approximately 0.5 mile south of the southeast corner of the proposed Ivanpah Valley Airport property boundary. The locations of the airport facilities and runways within the proposed Ivanpah airport property boundary have not been determined. East of Primm, the Bighorn Electric Generating Station is roughly 2,500 feet south of the proposed route (at its nearest point). The 20-mile segment, within BLM Utility Corridor, would cross vacant desert lands and require approximately 3.0 miles of new transmission line ROW. Lands adjacent to the BLM designated utility corridor, not including the Ivanpah CMA, are designated as Open Lands according to the Clark (South) County Comprehensive Plan. Open lands allow for low-density residential and other compatible uses.

The route crosses the unincorporated area of Primm for about 1.0 mile, on the southern boundary of the urban/developed area. Currently, Primm has three resort casinos, an outlet mall, and a residential area (see 4.9.4.1 Regional Setting). There are four proposed laydown areas near Primm. The smallest is west of Primm at the state line and the largest is southeast crossed by the proposed transmission line. The remaining two are near the Bighorn Electric Generating Station. The proposed route crosses vacant land, bordering Primm, for about 2,450 feet. The route is adjacent to a mobile home park (300 feet), multi-family residential complex (900 feet), and surface parking lot (1,200 feet). To the south of the surface parking lot, roughly 850 feet south of the proposed line, there are utility land uses. At its closest point, the line is approximately 100 feet away from utility land use. The route crosses a local road (which creates a southern boundary for Primm) and continues west, crossing the Primm Resort surface parking lot for 1,100 feet. The line then crosses an additional road, exiting the Primm area. The proposed route crosses adjacent to lands designated as Special District – Urban Village District, and crosses through Special District – Limited Resort and Apartment District, according to the Clark County Comprehensive Plan.

Southwest of Primm, the proposed route crosses a wide expanse of open desert (administered by the BLM-Needles Field Office) within the BLM-designated Utility Corridor BB-D for approximately 6.0 miles. Approximately 78.27 percent of the proposed route would be within designated utility corridor. The desert landscape in the area contains a small mountain peak, Ivanpah Lake, the I-15, and the Primm Valley Golf Club. The transmission line crosses the I-15 and northern portion of Ivanpah Lake. The small mountain peak is approximately 0.5 mile north, and the Primm Valley Golf Club is approximately 0.5 mile south of the transmission line route. The proposed route enters the proposed Ivanpah Substation from the north. The existing land use adjacent to the Ivanpah Substation portion of the study area can be characterized primarily as open desert and sparse development, with prevalent utilities and centers for commercial use. More specifically, there are pockets of San Bernardino County designated as General Commercial and Highway Commercial. Much of the land in the surrounding area is designated Resource Conservation by the San Bernardino County General Plan.

Transmission Line Alternative A (Segment parallel to DWP line)

The construction of Alternative A would require approximately 5.0 miles of a new transmission line ROW. Alternative A starts at the existing Eldorado Substation and crosses the Boulder City Annexation. The proposed Alternative A would be approximately 100 percent within the designated utility corridor, while the surrounding area is designated as Energy, Utility and Preserve by the Boulder City Master Plan.

Transmission Line Alternative B (North of Eldorado)

The construction of Alternative B would require 5.3 miles of new transmission line ROW. The proposed route crosses north and then southwest. The alternative would be approximately 58.03 percent within Boulder City designated utility corridor. The existing and planned land uses in the area of Alternative B would be the same as those for Alternative A, which include Preserve, Utility, and Energy.

Transmission Line Alternative C (Dry Lakes Reroute)

The construction of Alternative C would require 5.2 miles of new transmission line ROW. Alternative C is approximately 89 percent within BLM-designated utility corridor. The existing land uses surrounding Alternative C are open desert, managed by the BLM. The line crosses the I-15 and is 900 feet (at its nearest point) northwest of the Primm Valley Casino Resort’s parking lot. This area is designated as General Highway and Local Business District in the Clark County Comprehensive Plan.

Transmission Line Alternative D (South Dry Lakes Re-route)

Alternative D would be approximately 43 percent within BLM-designated utility corridors, and would require 3.2 miles of new ROW. Alternative D crosses a local Primm street and proposed laydown area where it abuts a utility area for 0.3 mile. Alternative D would be approximately 1,300 feet west of the Bighorn Electric Generating Station. Alternative D crosses the I-15 approximately 0.5 mile before meeting the proposed route. The alternative, primarily crossing BLM lands, passes through lands designated as Rural Open Land District by the Clark County Comprehensive Plan and adjacent to lands designated as Manufacturing and Industrial District.

Transmission Line Alternative E

The construction of Alternative E would require 0.7 miles of new ROW. Alternative E, running north-south, is 0.5 mile long and connects the proposed route to Alternative D. The proposed Alternative E would be outside the designated utility corridor. Alternative E is roughly 550 feet west of a utility area outside of Primm, approximately 2,100 feet west of the Generating Station, and approximately 0.5 mile east of Primm. The Clark County Comprehensive Plan designations are the same for Alternative E as they are for Alternative D, which include Rural Open Land District, Manufacturing, and Industrial District.

Substations

Ivanpah Substation

The proposed Ivanpah Substation would be constructed on a 38.5-acre vacant parcel adjacent to the existing transmission line. The site is located approximately 6.0 miles southwest of the state line in unincorporated San Bernardino County. It is approximately 2.0 miles west of the Primm Valley Golf Club, and would be completely within a BLM-designated utility corridor. There are no other structures or land uses surrounding the site.

Eldorado Substation

The Proposed Project would include the installation of structures within an expansion area approximately 165 feet to the west of the existing Eldorado Substation. The area is within the Boulder City Annexation area. There are no other existing land uses surrounding the substation and expansion area other than utility facilities. The Substation area would be entirely within a Boulder City-designated utility corridor and is planned for utilities/energy in the Boulder City Master Plan.

Telecommunication System

The proposed Telecommunications Facilities from the existing Eldorado Substation to the proposed Ivanpah Substation consist of separate sections, as follows:

Path 2-Section 1 Eldorado-Lugo 500kV Transmission Line Route

The transmission line extends for 25.0 miles, from the Eldorado Substation to the Eldorado-Lugo 500kV Transmission Line Tower (M152-T2). From the Eldorado Substation, the route travels south 6.0 miles across Boulder City Annexation. The area contains utilities and open desert. According to the Boulder City Master Plan, this segment of transmission line crosses land designated as Utility and is adjacent to lands designated as Preserve, Utility, and Energy. The route leaves Boulder City Annexation and crosses BLM land for approximately 19.0 miles. The BLM land contains several land designations; for instance, the route extends through the Eldorado-Piute ACEC for approximately 20.0 miles until it reaches SR 164/Nipton Road. Approximately 4.0 miles northeast from this intersection, the route abuts the east side of the Wee Thump Joshua Tree Wilderness Area for approximately 4.0 miles. Near the intersection of SR 164/Nipton Road and the Eldorado-Lugo 500kV transmission line, the northeast corner of the Crescent Townsite ACEC abuts the transmission line. This Crescent Townsite ACEC contains, and is adjacent to, mining locations. The proposed Path 2-Section 1 would be approximately 25.29 percent within the designated utility corridor.

Path 2-Section 2 Segment from the Eldorado-Lugo 500kV Transmission Line to the Unincorporated Area of Nipton (New Line)

New Line, underground, extends west from the Eldorado-Lugo 500kV transmission line tower (Tower M-152), near the intersection of SR 164/Nipton Road and the Eldorado-Lugo 500kV transmission line, to the unincorporated area of Nipton. The tower is located approximately 5.0 miles east of the unincorporated area of Nipton. The unincorporated area of Nipton has a hotel with historical characteristics that would be approximately 100 feet south of Path 2-Section 2. There is a previously disturbed laydown area at Nipton. On the Nevada side, the route has the Eldorado-Piute ACEC abutting the north, and the Crescent Townsite ACEC is immediately southeast. The route, on the California side, abuts the Ivanpah DWMA ACEC to the north and the Mojave National Preserve to the South. This new line would be installed underground within a new ROW and outside designated utility corridor.

Path 2-Section 3: Alternatives 1 and 2 Segment from Unincorporated Area of Nipton to I-15 Junction Point (Nipton 33kV and New Line)

The unincorporated area of Nipton to I-15 junction point Telecommunications Facilities would span a distance of approximately 10.0 miles. Approximately 1.0 mile would be constructed above ground on the existing Nipton 33kV Line and 9.0 miles would be constructed underground. The proposed underground Path would be approximately 11.30 percent within the designated utility corridor and the aboveground Path would be outside utility corridor. This route parallels Nipton Road in an east-west direction. The line abuts the northern boundary of the Mojave National Preserve for 6.0 miles. There is 1.0 mile of private land that is crossed and 3.0 miles of line abutting the Mojave National Preserve. Abutting the line to the north is land designated as the Ivanpah DWMA ACEC. The line crosses Ivanpah Lake and vacant, private lands are adjacent.

Path 2-Section 3-Alternative 1 Segment from I-15 Junction Point to Ivanpah Substation (Nipton 33kV and New Line)

From I-15 junction point to Mountain Pass Substation, the Telecommunications Facilities would cross approximately 9.0 miles of land, which include BLM land (6.5 miles) and the unincorporated areas of Wheaton Springs and Mountain Pass (2.5 miles). The Mountain Pass Substation to Ivanpah Substation Telecommunication Facilities would cross approximately 6.0 miles of BLM land. Near Mountain Pass Substation, the line abuts California State Land and is approximately 0.5 mile east of the Clark Mountain ACEC. Approximately 500 feet of underground conduit would be installed from the Ivanpah substation to the last Nipton 33kV distribution line pole. The Alternative 1 route is located within existing BLM designated utility corridors and primarily within existing ROWs.

Path 2-Section 3-Alternative 2 Segment from I-15 Junction Point to Ivanpah Substation (Nipton 33kV and New Line)

The I-15 junction point to Ivanpah Substation Telecommunication Facilities would span a distance of approximately 10.0 miles. This route (Nipton 33kV line) runs north, paralleling the

I-15 for almost 7.0 miles and crossing a laydown area. The route would cross the southern boundary of the Primm Valley Golf Club for 1.0 mile. The last mile along the existing 115kV transmission line corridor would be installed on the distribution line poles. The Alternative 2 route is located within existing designated utility corridors and primarily within existing ROWs.

4.9.4 Environmental Impacts and Mitigation Measures

Impact Analysis

Transmission Line

Would the Project physically divide an established community?

The proposed transmission line route generally follows an existing transmission line route within existing ROWs. A majority of the line is within BLM and Boulder City designated utility corridors and within current ROWs. The unincorporated area of Primm is the only established community that is within a 0.5-mile radius of the proposed transmission line route. The proposed transmission line route crosses south of Primm. The route is approximately 100 feet away from the nearest community and does not create division. During construction and operation of the Proposed Project, the proposed transmission line and alternatives would have no impacts on established communities.

Would the Project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

The proposed transmission line route primarily crosses open space within designated utility corridors and current ROWs, which does not conflict with plans, policies, or regulations. The line crosses a surface parking lot for approximately 1,100 feet, and the replacement towers would not change the use of the parking lot. Approximately 3.3 to 5.3 miles of a new ROW would be required, and would parallel existing utility corridors and ROWs, crossing open lands that allow such uses. The Proposed Project would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project; therefore, the Proposed Project would have no impact during construction and operation.

Would the Project conflict with any applicable habitat conservation plan or natural community conservation plan?

Because the majority of the proposed transmission line route is within designated utility corridors, current ROWs, and/or Boulder City Annexation (in which the plans do not apply), the Project would not conflict with applicable habitat conservation plans or natural community conservation plans. The small portions of the route that would be excluded from these areas would be short in distance to, parallel to, and near existing utility corridors and ROWs. During construction and operation of the Proposed Project, there would be no impact on land use pertaining to conservation plans.

Substations

Would the Project physically divide an established community?

The proposed Ivanpah Substation and the expansion of the Eldorado Substation would be constructed on vacant land located within designated utility corridors. There are no residential uses within 0.5 mile of either substation location and there would be no construction and operation impacts.

Would the Project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

The Project would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project adopted for the purpose of avoiding or mitigating an environmental effect. The Substations are located in designated utility corridors, and are generally located within existing ROWs. Boulder City zones the Eldorado Substation and designates it as 'Energy Resource,' which is compatible to the Project. The proposed Ivanpah Substation would be constructed and operated on BLM land, which is designated as a utility corridor. The modification of the existing substation and construction of the proposed substation would not conflict with applicable plans, policies, or regulations and therefore Project construction and operation would have no impacts.

Would the Project conflict with any applicable habitat conservation plan or natural community conservation plan?

The Eldorado Substation expansion would not conflict with any applicable habitat conservation plan or natural community conservation plan because it is located within the designated unmanaged area of Clark County. The proposed Ivanpah Substation would not conflict with any plan because construction and operation would be implemented in compliance with the Northern and Eastern Mojave Desert Management Plan and California Desert Conservation Area Plan. Pertaining to applicable habitat or community conservation plans, the Proposed Project construction and operation would have no impact on land use and planning.

Telecommunications

Would the Project physically divide an established community?

There are no established communities within a 0.5-mile radius of the Eldorado-Lugo 500kV transmission line or the new line. Although there are established communities along the Nipton 33kV transmission line, the proposed telecom would not physically divide any community. The majority of the line, which passes through communities, is within designated utility corridors and existing ROWs. Construction and operation of the Proposed Project and alternatives would not physically divide an established community and would therefore result in no impact.

Would the Project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

The proposed Telecommunication System modifications are primarily within the existing ROWs and cross open lands. This holds true for the Eldorado-Lugo 500kV transmission line and the Nipton 33kV transmission line. Much of the Nipton 33kV transmission line is within a designated utility corridor. The New Line of the Telecommunication System would require new ROWs and the construction of a New Line along the Mojave National Preserve. The acquired ROW for Path 2-Section 2 would be installed underground. The New Line would be approximately 5 miles in distance and it would parallel SR 164/Nipton Road. New line would be required for approximately 9.0 miles along Nipton Road. New line would also be required for Path 2-Section 3-Alternatives 1 and 2 and would not conflict with any applicable land use plan, policy, or regulation because it is in a BLM designated utility corridor (BB-D). The construction and operation of the Proposed Project and alternatives would have no impacts.

Would the Project conflict with any applicable habitat conservation plan or natural community conservation plan?

The Eldorado-Lugo 500kV transmission line and the Nipton 33kV transmission line already exist and would only require modifications. The New Line would require installation of underground duct. The New Line, entering Nipton, is less than 5.0 miles in length and would parallel the existing SR 164/Nipton Road. The New Line, connecting to Ivanpah Substation, would not conflict with any applicable habitat conservation plan or natural community conservation plan. It is within a BLM designated utility corridor. During construction and operation of the Proposed Project, the telecommunication facilities would not have impacts on land use and planning in regards to conservation plans.

Mitigation Measures

Because construction and operation impacts to land use plans, policies, and regulations would be less than significant, no mitigation measures would be needed.

4.9.5 Evaluation and Comparison of Proposed Routes and Alternatives

Table 4-35 provides ROW distances.

TABLE 4-35 LENGTH OF PROPOSED AND ALTERNATIVE TRANSMISSION LINE ROUTES (in miles)						
	Proposed Route	**Alternative Route A**	**Alternative Route B**	**Alternative Route C**	**Alternative Route D**	**Alternative Route E**
Existing Transmission Line ROW	34.7	29.0	32.9	30.3	31.8	34.3
New Transmission Line ROW	34.7	5.0	5.6	5.2	3.2	0.7
Total	34.7	34.0	38.5	35.5	35.0	35.0
*Existing ROW needs to be widened for the entire route.						

The Eldorado-Ivanpah 220kV proposed transmission line route would require 34.7 miles of new transmission line ROW, which would have the least impact on land use resources.

4.9.6 References

BLM. _____. 2008 LR2000.

_____. 2002. Proposed Northern and Eastern Mojave Desert Management Plan, Amendment to the California Desert Conservation Area Plan and Final Environmental Impact Statement

_____. 1998. Proposed Las Vegas Resource Management Plan and Environmental Impact Statement.

_____. 1980, 1999. California Desert Conservation Area Plan and Final Environmental Impact Statement.

City of Boulder City. 2003. Master Plan.

U.S. National Park Service. 2002. Mojave National Preserve General Management Plan.

4.10 NOISE

4.10.1 Background

4.10.1.1 Fundamentals of Noise

Noise is defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. There are several ways to measure noise, depending on the source of the noise, the receiver, and the reason for the noise measurement. Acoustical technical noise terms are summarized in Section 12, Glossary and Acronyms.

The most common metric is the overall A-weighted sound level measurement that has been adopted by regulatory bodies worldwide. The A-weighting network measures sound in a similar fashion to how a person perceives or hears sound, thus achieving very good correlation in terms of how to evaluate acceptable and unacceptable sound levels.

A-weighted sound levels are typically measured or presented as the equivalent sound pressure level (L_{eq}), which is defined as the average noise level, on an equal energy basis for a stated period of time, and is commonly used to measure steady state sound or noise that is usually dominant. Statistical methods are used to capture the dynamics of a changing acoustical environment. Statistical measurements are typically denoted by L_{xx}, where $_{xx}$ represents the percentile of time the sound level is exceeded. For example, the L_{90} is a measurement that represents the noise level that is exceeded during 90 percent of the measurement period. Similarly, the L_{10} represents the noise level exceeded for 10 percent of the measurement period. The relative A-weighted noise levels of common sounds measured in the environment and industry for various qualitative sound levels are provided in Table 4-36.

Another metric used in determining the impact of environmental noise is the differences in response that people have to daytime and nighttime noise levels. During the evening and at night, exterior background noises are generally lower than daytime levels. However, most household noise also decreases at night and exterior noise becomes more noticeable. Furthermore, most people sleep at night and are sensitive to intrusive noises. To account for human sensitivity to evening and nighttime noise levels, the Daytime-Nighttime Noise Level (DNL, also abbreviated as L_{dn}) and Community Noise Equivalent Level (CNEL) were developed. The DNL is a noise metric that accounts for the greater annoyance of noise during the nighttime hours (10:00 p.m. to 7:00 a.m.). The CNEL is a noise index that accounts for the greater annoyance of noise during both the evening (7:00 p.m. to 10:00 p.m.) and nighttime hours.

TABLE 4-36
TYPICAL SOUND LEVELS MEASURED IN THE ENVIRONMENT AND INDUSTRY

Noise Source At a Given Distance	A-Weighted Sound Level in Decibels	Qualitative Description
Carrier deck jet operation	140	
	130	Pain threshold
Jet takeoff (200 feet)	120	
Auto horn (3 feet)	110	Maximum vocal effort
Jet takeoff (1,000 feet) Shout (0.5 foot)	100	
N.Y. subway station Heavy truck (50 feet)	90	Very annoying Hearing damage (8-hr, continuous exposure)
Pneumatic drill (50 feet)	80	Annoying
Freight train (50 feet) Freeway traffic (50 feet)	70 to 80	
	70	Intrusive (Telephone use difficult)
Air conditioning unit (20 feet)	60	
Light auto traffic (50 feet)	50	Quiet
Living room Bedroom	40	
Library Soft whisper (5 feet)	30	Very quiet
Broadcasting/Recording studio	20	
	10	Just audible

Adapted from Table E, “Assessing and Mitigating Noise Impacts,” NY DEC, February 2001.

DNL values are calculated by averaging hourly L_{eq} sound levels for a 24-hour period, and applying a weighting factor to the nighttime L_{eq} values. CNEL values are calculated similarly, except that a weighting factor is also added to evening L_{eq} values. The weighting factors, which reflect the increased sensitivity to noise during evening and nighttime hours, are added to each hourly L_{eq} sound level before the 24-hour DNL or CNEL is calculated. For the purposes of assessing noise, the 24-hour day is divided into three time periods, with the following weightings:

- Daytime hours: 7:00 a.m. to 7:00 p.m. (12 hours) – Weighting factor of 0 dBA
- Evening hours (for CNEL only): 7:00 p.m. to 10:00 p.m. (3 hours) – Weighting factor of 5 dBA
- Nighttime hours (for both CNEL and DNL): 10:00 p.m. to 7:00 a.m. (9 hours) – Weighting factor of 10 dBA

The adjusted time period noise levels are then averaged (on an energy basis) to compute the overall DNL or CNEL value. For a continuous noise source, the DNL value is easily computed by adding 6.4 dBA to the overall 24-hour noise level (L_{eq}). For example, if the expected continuous noise level from a noise source is 60.0 dBA, the resulting DNL from the source would be 66.4 dBA. Similarly, the CNEL for a continuous noise source is computed by adding 6.7 dBA to the overall 24-hour L_{eq}.

The effects of noise on people can be listed in three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction
- Interference with activities such as speech, sleep, learning
- Physiological effects such as startling and hearing loss

In most cases, environmental noise may produce effects in the first two categories only. No completely satisfactory way exists to measure the subjective effects of noise, or to measure the corresponding reactions of annoyance and dissatisfaction. This lack of a common standard is primarily due to the wide variation in individual thresholds of annoyance and habituation to noise. Thus, an important way of determining a person's subjective reaction to a new noise is by comparing it to the existing or "ambient" environment to which that person has adapted. In general, the more the level or the tonal (frequency) variations of a noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual.

The general human response to changes in noise levels that are similar in frequency content (for example, comparing increases in continuous (L_{eq}) traffic noise levels) are summarized as follows:

- a 3-dB change in sound level is considered a barely noticeable difference
- a 5-dB change in sound level will typically be noticeable
- a 10-dB change is considered to be a doubling in loudness

4.10.1.2 Project Noise Sources

Equipment used in the construction of the Proposed Project would generate noise. Typical noise levels generated by construction equipment have been previously calculated and published in various reference documents. One of the most recent and complete compilations of construction equipment noise is the Roadway Construction Noise Model prepared by the Federal Highway

Administration (FHWA). The expected equipment noise levels listed in the *Roadway Construction Noise Model User's Guide* (FHWA 2006) were used for this evaluation.

There are three potential sources of operational noise associated with the project: corona noise from the transmission lines, noise from the substation equipment, and vehicle noise from maintenance vehicles (infrequent).

The electrical effects of high-voltage transmission lines fall into two broad categories: corona effects and electric field effects. Corona is the ionization of the air that occurs at the surface of the energized conductor and suspension hardware due to very high electric field strength at the surface of the metal during certain conditions. Corona may result in radio and television reception interference, audible noise, light, and production of ozone. The amount of corona produced by a transmission line is a function of the voltage of the line, the diameter of the conductor (or bundle of conductors), the elevation of the line above sea level, the condition of the conductor and hardware, and the local weather conditions. Corona is less noticeable on lines operated at lower voltages.

The electric field gradient that causes corona is the rate at which the strength of the electric field changes with distance and is directly related to the line voltage. The electric field gradient is greatest at the surface of the conductor. Large-diameter conductors have lower electric field gradients at the conductor surface and, hence, lower corona than smaller conductors, everything else being equal. Irregularities (such as nicks and scrapes on the conductor surface) or sharp edges on suspension hardware concentrate the electric field at these locations, increasing the electric field gradient and corona at these spots. Similarly, contamination on the conductor surface, such as dust or insects, can cause irregularities that are a source for corona. Corona also increases at higher elevations where the density of the atmosphere is less than at sea level.

Raindrops, snow, fog, hoarfrost, and condensation accumulated on the conductor surface are sources of surface irregularities that can increase corona. During fair weather the number of these sources of surface irregularities is fewer and the corona effect is lower. However, during wet weather, the number of these sources of surface irregularities increases (for instance, due to rain drops standing on the conductor and energized hardware) and corona effects are greater.

Corona generates audible noise during operation of transmission lines. The noise is generally characterized as a crackling, hissing, or humming noise. During wet or foul weather conditions, the conductor will produce the greatest amount of corona noise. The noise is most noticeable during wet conductor conditions such as rain or fog. However, during heavy rain the ambient noise generated by the falling raindrops will typically be greater than the noise generated by corona. Audible noise from transmission lines is often masked by the background noise at locations beyond the edge of the ROW, particularly where the line is near a source of background noise such as a freeway (EPRI 2005).

Transformer noise is a potential source of noise associated with substations. Transformers emit a characteristic hum resulting from magnetostrictive forces that cause the core to vibrate. In addition, transformer cooling fans produce noise when they operate. This Project would consist of up to 1,120 MVA 220/115kV transformers. Standard transformers having capacity of up to 1,120 MVA are estimated to result in 64 dBA at distance of 400 feet (EEI 1984).

4.10.1.3 Noise Sensitive Receptors/Uses

Noise-sensitive land uses generally are defined as locations where people reside or where the presence of unwanted sound could adversely affect the designated use of the land. Typically, noise-sensitive land uses include residences, hospitals, places of worship, libraries, and schools, as well as nature and wildlife preserves and parks. One sensitive receptor in the Proposed Project area, the Desert Oasis Apartment Complex, is located 0.01 mile from the existing and proposed transmission line and 6.7 miles from the Proposed Ivanpah Substation. Another sensitive receptor, Primm Valley Golf Club, is located 0.64 mile from the existing and proposed transmission line and 2.4 miles from the Proposed Ivanpah Substation. These two sensitive receptors were used as monitoring sites and are shown in relationship to the transmission line and alternatives on Figure 4.10-1 (located in Map Volume).

4.10.2 Regulatory Setting

4.10.2.1 Federal

While there are no federal regulations that limit overall environmental noise levels, there are federal guidance documents that address environmental noise and regulations for specific sources (for example, aircraft or federally funded highways).

The only energy facility-specific requirements are those of the FERC, which regulates interstate electrical transmission lines, natural gas, and petroleum pipelines. The FERC limits specifically address compressor facilities associated with pipelines under its jurisdiction, and limits the noise to 55 dBA DNL in noise sensitive areas (FERC 2002).

There are also federal highway and aircraft guidelines/regulations established by FHWA (United States Code of Federal Regulations [CFR] Title 23 Part 772) and FAA (CFR Title 18 Part 150). A summary of federal guidelines/regulations is presented in Table 4-37.

TABLE 4-37
SUMMARY OF FEDERAL GUIDELINES/REGULATIONS FOR EXTERIOR NOISE (DBA)

Agency	L_{eq}	DNL
Federal Energy Regulatory Commission	[49]	55
Federal Highway Administration	67	[67]
Federal Aviation Administration	[59]	65
U.S. Department of Transportation—Federal Rail Authority (FRA) and Federal Transit Authority (FTA) (FRA 1998 and FTA 1995)[a,b]	Sliding scale, refer to Figure 4.10-2	Sliding scale, refer to Figure 4.10-2
U.S. Environmental Protection Agency (EPA 1974)[c]	[49]	55
U.S. Department of Housing and Urban Development[d]	[59]	65

Note: Brackets (e.g., [59]) indicate calculated equivalent standard. Because FHWA regulates peak noise level, the DNL is assumed equivalent to the peak noise hour.
Sources:
[a]FRA 1998
[b]FTA 1995
[c]EPA 1974
[d]CFR Title 24 Part 51B

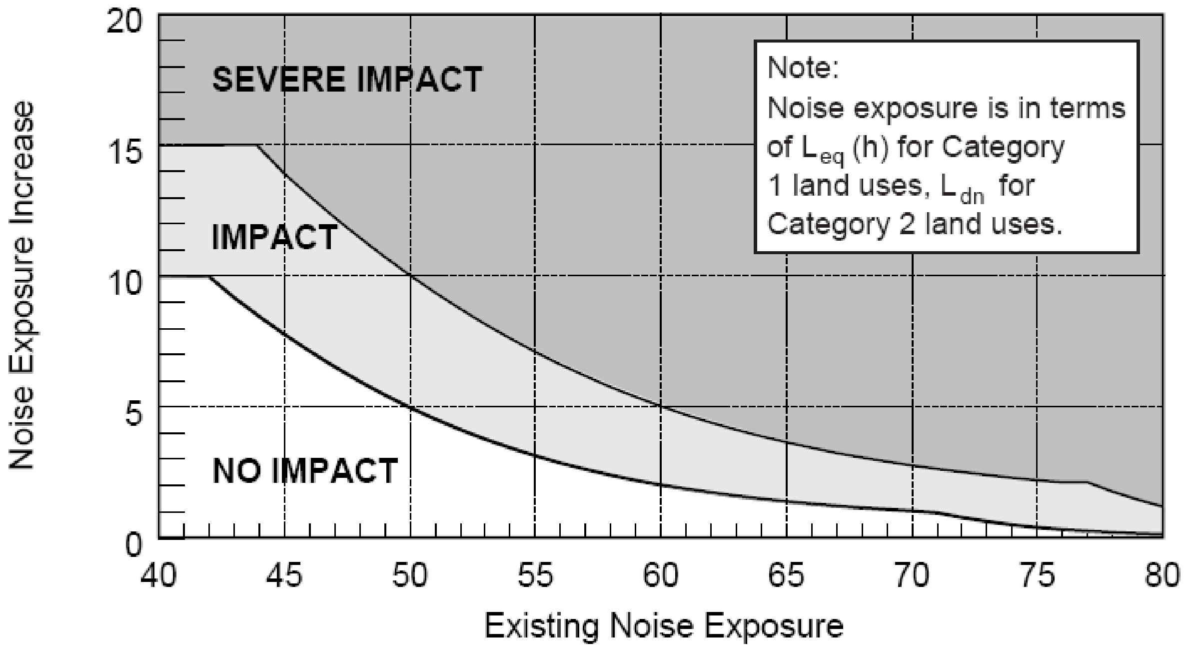

Figure 4.10-2 FRA and FTA Allowable Increase in Cumulative Noise Level
(Note: Residential uses are included in Category 2)

4.10.2.2 State

<u>California Public Utilities Commission</u>

The Proposed Project will also require approval from the CPUC. The CPUC will evaluate the Proposed Project's noise impacts in light of the requirements of the CEQA. The CPUC will evaluate these impacts for both the California and Nevada sides of the project.

CEQA Guidelines define a "significant effect" on the environment to mean a "...substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance" (California Code of Regulations [CCR], Title 14, § 15382).

CEQA does not specify a threshold for "substantial increase" for noise.

The CPUC GO No. 131-D, Section XIV B clarifies that "local jurisdictions acting pursuant to local authority are preempted from regulating electric power line projects, distribution lines, substations, or electric facilities constructed by public utilities subject to the Commission's jurisdiction. However, in locating such projects, the public utilities shall consult with local agencies regarding land use matters." Due to this GO, the public utilities are directed to consider local regulations and consult with local agencies; however, counties and cities do not have regulatory jurisdiction over the Proposed Project

Public Utilities Commission of Nevada

The Proposed Project will also require approval from the PUCN. The construction of a utility facility, defined as a transmission line that is 200kV or more, requires a permit by the PUCN under the UEPA according to the NRS 704.820 through 704.900. However, the replacement of an existing facility with a like facility, as determined by the Commission, does not constitute construction of a utility facility (NRS 704.865) (NSL 2009).

4.10.2.3 Local Plans, Laws, Ordinances, Regulations, and Standards

Although the Proposed Project is exempt in California from local land use and zoning regulations and permitting under GO No. 131-D, SCE intends to develop facility designs that are compatible with local plans and zoning to the extent practicable. Therefore, a review was conducted of local plans, laws, ordinances, regulations, and standards related to noise adopted by each of the jurisdictions through which the proposed transmission project would pass. Results of the review are presented in Tables 4-38 and 4-39.

TABLE 4-38
LAWS, ORDINANCES, REGULATIONS, AND STANDARDS DURING CONSTRUCTION BY JURISDICTION

Jurisdiction	Source	Standard Construction Hours	Permissible Noise Levels		
			Land Use	Hours	Exterior Noise Level Limits (dBA)
San Bernardino County	Sec 87.0905 (e) Exempt noises. (1) (C) Temporary construction, repair, or demolition activities between 7:00 a.m. and 7:00 p.m., except Sundays and federal holidays.	Mon-Sat 7am-7pm	Any	Mon-Sat 7am-7pm	Exempt
Clark County	Sec 30.68.020 (h): Requirements of this section (see operational table) do not apply to construction and/or demolition activities when conducted during daytime hours.	Daytime	Any	Daytime	Do not apply
Primm	No construction noise guidelines specified.	NS	NS	NS	NS
Boulder City	No construction noise guidelines specified.	NS	NS	NS	NS

NS – Not specified

TABLE 4-39
LAWS, ORDINANCES, REGULATIONS, AND STANDARDS DURING OPERATION BY JURISDICTION

Jurisdiction	Source	Permissible Noise Levels: Land Use	Hours	Exterior Noise Level Limits (dBA)
San Bernardino County	Sec 87.0905 (b) (1) Areas within San Bernardino County shall be designated as "noise-impacted" if exposed to existing or projected future exterior noise levels from stationary sources exceeding the standards listed. (2) No person shall operate or cause to be operated any source of sound at any location or allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, which causes the noise level, when measured on any other property, either incorporated or unincorporated, to exceed: (A) the noise standard for that receiving land use for a cumulative period of more than 30 minutes in any hour (B) the noise standard plus 5 dBA for a cumulative period of more than 15 minutes in any hour (C) the noise standard plus 10 dBA for a cumulative period of more than 5 minutes in any hour (D) The noise standard plus 15 dBA for a cumulative period of more than 1 minute in any hour (E) The noise standard plus 20 dBA for any period of time	Residential	7am-10pm	55 L_{eq}
			10pm-7am	45 L_{eq}
		Professional Services	Anytime	55 L_{eq}
		Other Commercial	Anytime	60 L_{eq}
		Industrial	Anytime	70 L_{eq}
Clark County	Sec 30.68.020 (b): The maximum permissible sound pressure level of any continuous, regular, or frequency source of sound produced by any activity shall be established by time period and type of zoning district per Table 30.68-1.	Residential, Business, and Industrial	Depends on octave band frequency	Depends on octave band frequency
	Sec 30.68.020 (e): Impulsive type noises shall be subject to the standards described in Table 30.68-2, provided they are capable of being accurately measured with the equipment described above.	Residential	Daytime	56
			Nighttime	46
		Business and Industrial	Daytime	65
			Nighttime	61
Primm	No operation noise guidelines specified.	NS	NS	NS
Boulder City	No operation noise guidelines specified.	NS	NS	NS

NS – Not Specified

4.10.3 Significance Criteria and Approach to Impact Assessment

4.10.3.1 Significance Criteria

The significance of potential impacts was assessed in accordance with Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.), which indicate that a proposed project would have a significant noise impact if it results in:

- exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies
- exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels
- a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project
- a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project
- location of a project within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, exposing people residing or working in the project area to excessive noise levels
- location of a project within the vicinity of a private airstrip, exposing people residing or working in the project area to excessive noise levels

4.10.3.2 Applicant Proposed Measures

As part of constructing the project, the following noise abatement measures would be implemented:

NOI-1 **Compliance with Local Noise Ordinances.** The proposed construction would comply with local noise ordinances. There may be a need to work outside the aforementioned local ordinances in order to take advantage of low electrical draw periods during the nighttime hours. SCE would comply with variance procedures requested by local authorities if required.

NOI-2 **Construction Equipment Working Order.** Construction equipment would be in good working order.

NOI-3 **Construction Equipment Maintenance.** Construction equipment would be maintained per manufacturer's recommendations.

NOI-4 **Construction Equipment Muffled**. Construction equipment would be adequately muffled.

NOI-5 **Construction Equipment Idling Minimized.** Idling of construction equipment and vehicles would be minimized during the construction.

NOI-6 **Hearing Projection for Workers.** Workers would be provided appropriate hearing protection, if necessary, as described in the Health and Safety Plan.

4.10.3.3 Approach to Impact Assessment

Methodology

A site visit and detailed noise measurements were conducted to document existing sources of noise and background noise levels in the vicinity of the Proposed Project. The noise level measurements included both long-term (24 hour) and short-term measurements. Proposed Project elements and noise monitoring locations are shown on Figure 4.10-1 (located in Map Volume). For assessment of potential noise impacts from the Proposed Project, construction and operations noise levels for each option were evaluated.

Significance Thresholds

The CEQA Guidelines define a “significant effect” on the environment to mean a “substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including...ambient noise” (CCR, Title 14, § 15382).

For purposes of evaluating potential noise impacts, the following thresholds of significance were used during the evaluation of noise during construction and operation of the Proposed Project. Noise associated with construction would be potentially significant if: (1) the construction activity is permanent; (2) use of heavy equipment would occur after daytime hours; (3) it exceeds applicable local standards; and (4) no feasible noise abatement measures can be implemented for noise-producing equipment.

For “permanent increases” associated with corona noise or substation noise, the threshold for a potentially significant increase is 5 dBA, resulting in a level that exceeds 40 dBA. Permanent increases of any magnitude that do not result in levels above 40 dBA are considered less than significant. In addition, increases that result in permanent noise levels greater than 50 dBA are considered potentially significant.

The above thresholds were established based on the following federal and California guidance. EPA guidelines recommend an L_{dn} of 55 dBA (49 dBA L_{eq}) as sufficient to protect the public from the effects of broadband environmental noise in quiet outdoor settings and residential neighborhoods (EPA 1974). The FAA and the Federal Interagency Committee on Urban Noise have issued land use compatibility guidelines indicating that a yearly L_{dn} of less than 65 dBA (59 dBA L_{eq}) is compatible with residential land uses and that, if a community determines it is necessary, levels up to 75 dBA (69 dBA L_{eq}) may be compatible with residential uses and transient lodgings (but not mobile homes), if such structures incorporate noise-reduction features (14 CFR 150, Appendix A). FERC requires natural gas pipelines to demonstrate that stations with compressors will not exceed an L_{dn} of 55 dBA (49 dBA L_{eq}) in noise-sensitive areas such as schools, hospitals, and residences (18 CFR 380.12(k)(4)(v)(A)). A noise level of 40 dBA would be considered quiet in many locations and would be consistent with the recommendations of the California Model Community Noise Control Ordinance for rural environments. A 5 dBA change in sound level is typically necessary to result in a noticeable community response, as a 3 dBA increase is generally considered the threshold of perceptible change outside of a laboratory when comparing similar sources of noise.

4.10.4 Environmental Setting

The existing noise environment, including noise sensitive receptors and ambient noise, for the Proposed Project is described below.

Given the arid nature of the project area, corona-generated audible noise would occur infrequently; in addition most of the areas adjacent to the proposed corridor are undeveloped and sparsely populated. Corona noise would be scarcely discernible within 0.25 mile or less from the center of the nearest transmission tower (Department of Energy 2008).

The study area for the noise environment is conservatively defined as 0.5 mile on each side of the centerline of the proposed alignment, or 0.5 mile from the perimeter of each substation. As presented in Section 4.10.5.1.1, modeling results indicate that construction noise levels from the project would drop off to 58 dBA beyond 1,600 feet. This level of noise is less than the noise level of normal conversation at 3 feet (65 dBA).

4.10.4.1 Regional Setting

The Proposed Project would be located in a primarily rural area, although a portion of the proposed transmission line route would pass through or adjacent to Primm, Nevada. A detailed description of the Land Uses and Land Use designations for the Proposed Project are discussed in the Land Use section of this PEA document.

4.10.4.2 Local Setting

Ambient Noise Surveys

Ambient noise surveys were conducted November 20 and 21, 2008, at three representative monitoring locations (sites 1, 2, and 3) to assess the existing ambient noise levels of the representative locations. The surveys consisted of continuous unattended long-term monitoring stations. Two of the sites were monitored for 24 hours each; one of the sites was monitored for 18 hours.

Weather conditions during the survey as measured in Henderson, Nevada consisted of clear skies, wind speeds between 4 and 10 miles per hour, temperatures between 45 and 72 degrees Fahrenheit, and relative humidity between 15 and 37 percent. Henderson is located approximately 40 miles northeast of monitoring sites 1 and 2, and 20 miles northwest of site 3.

Larson Davis 820 Type 1 (precision) sound level meters were used. The meters were factory calibrated within the previous 12 months and were field calibrated prior to and after each measurement series with a Larson Davis CAL200 field calibrator. Microphones were attached to tripods at a height of approximately 5 feet. Shrouds and windscreens were used to protect the microphones from moisture and wind. A shroud and windscreen were not available for the Eldorado substation site; however, weather conditions were such that the absence of protective equipment should not have impacted the results (i.e., calm winds and no rain).

A description of each site, the date each survey was conducted, and a summary of the collected data are presented in Table 4-40. Complete survey results and graphs are presented in Appendix H, as are photographs of each monitoring location site.

TABLE 4-40
NOVEMBER 20 AND 21, 2008, NOISE SURVEY RESULTS SUMMARY (DBA)

Noise Monitoring Location	Description	Primary Noise Source	Monitoring Period	L_{dn}	L_{eq} (24 hr)	Max Hourly L_{eq}	Min Hourly L_{eq}
1 Primm Valley Golf Club	Rural	I-15, golf course activities	24 hours	62	55	58	45
2 Desert Oasis Apartment Complex	Residential	I-15, truck stop	24 hours	58	51	55	48
3 Eldorado Substation	Rural	Substation	18 hours	56	49[a]	51	47

[a] Monitoring at the Eldorado Substation was limited to 18 hours, therefore the L_{dn} and the 24-hr L_{eq} were calculated using noise levels from representative periods for the missing hours. Given the relatively steady noise level (indicated by close agreement between the Max and Min L_{eq}), this assumption is reasonable.

Transmission Line

Proposed Transmission Line

The proposed transmission line starts at the existing Eldorado Substation and ends at the future Ivanpah Substation location. The only residences within the study area are located in Primm, Nevada, at the Desert Oasis Apartment Complex. The apartment and mobile home park complex is located within 0.01 mile of the proposed transmission line. There are no hospitals, libraries, schools, places of worship, or other facilities in the study area. Except where the transmission line passes through Primm, the setting is rural and undeveloped in nature. The presence of potentially sensitive biological resources in the project vicinity is addressed in the biological resources section of this PEA.

The noise levels measured during the noise survey at the Eldorado Substation are representative of the noise levels at the northern end of the transmission line. The minimum hourly L_{eq} and L_{90} noise levels measured at the substation during the noise survey were 47 dBA and 46 dBA, respectively. The noise levels measured during the noise survey at the Desert Oasis Apartment Complex are representative of the noise levels through the center portion of the transmission line. The minimum hourly L_{eq} and L_{90} noise levels measured at the Desert Oasis Apartment Complex were 48 dBA and 46 dBA, respectively. The noise levels measured during the noise survey at the Primm Valley Golf Club are representative of the noise levels at the southern end of the transmission line. The minimum hourly L_{eq} and L_{90} noise levels measured at the Primm Valley Golf Club during the noise survey were 45 dBA and 41 dBA, respectively.

Transmission Line Alternative A

The Transmission Line Alternative A provides an alternative route for the proposed transmission line between the Eldorado Substation and the Boulder City boundary before connecting with the existing transmission line route, continuing to the Proposed Ivanpah Substation. The existing setting for Transmission Line Alternative A is the same as described for the proposed transmission line.

The measured noise levels throughout the project vicinity as reported for the proposed transmission line also apply to transmission line Alternative A.

Transmission Line Alternative B

The Transmission Line Alternative B extends the proposed transmission line north from the Eldorado Substation before turning southwest to join the existing transmission line and continuing to the Proposed Ivanpah Substation. The existing setting for Transmission Line Alternative B is the same as described for the proposed transmission line.

The measured noise levels throughout the project vicinity as reported for the Proposed Project also apply to Transmission Line Alternative B.

Transmission Line Alternative C

Transmission Line Alternative C is an alternative for the proposed transmissions line that circles northwest around Primm. The existing setting for Transmission Line Alternative C is the same as described for the proposed transmission line except for the distance from the Desert Oasis Apartment Complex, which is located approximately 0.67 mile from Transmission Line Alternative C.

The measured noise levels throughout the project vicinity as reported for the proposed transmission line also apply to Transmission Line Alternative C.

Transmission Line Alternative D

Transmission Line Alternative D is an alternative for the proposed transmission line that circles southwest around Primm. The existing setting for Transmission Line Alternative D is the same as described for the proposed transmission line except for the distance from the Desert Oasis Apartment Complex, which is located approximately 0.57 mile from Transmission Line Alternative D.

The measured noise levels throughout the project vicinity as reported for the proposed transmission line also apply to Transmission Line Alternative D.

Transmission Line Alternative E

Transmission Line Alternative E provides a sub-alternative to Alternative D by tying into the Proposed Transmission Line on the north end farther south than the Alternative D tie-in. The existing setting for Transmission Line Alternative E is the same as described for the proposed transmission line except for the distance from the Desert Oasis Apartment Complex, which is located approximately 0.57 mile from Transmission Line Alternative E.

The measured noise levels throughout the project vicinity as reported for the proposed transmission line also apply to Transmission Line Alternative E.

Substations

Eldorado Substation

The Eldorado Substation is an existing substation. There are no residences within 5 miles of the substation; the nearest receptors would be recreational users on Dry Lake north of the substation, 3.5 miles distant at its closest point. There are no hospitals, libraries, schools, places of worship, or other facilities in the study area. The setting is rural and undeveloped in nature. The presence of potentially sensitive biological resources in the project vicinity is addressed in the biological resources section of this PEA.

The minimum hourly L_{eq} and L_{90} noise levels measured at the Eldorado Substation during the noise survey were 47 dBA and 46 dBA, respectively.

Ivanpah Substation

The Ivanpah Substation will be a new substation at the south end of the proposed transmission line. The closest residences to the Ivanpah Substation are those at the Desert Oasis Apartment Complex, roughly 6.7 miles to the northeast. The nearest receptors are at the Primm Valley Golf Club, a distance of 2.4 miles. There are no hospitals, libraries, schools, places of worship, or other facilities in the study area. The setting is rural and undeveloped in nature. The presence of potentially sensitive biological resources in the project vicinity is addressed in the biological resources section of this PEA.

The noise levels measured during the noise survey at the Primm Valley Golf Club are representative of the noise levels in the study area nearest the Proposed Ivanpah Substation. The minimum hourly L_{eq} and L_{90} noise levels measured at the substation during the noise survey were 45 dBA and 41 dBA, respectively.

Telecommunication System

The proposed Telecommunication System follows two potential routes with sub-alternatives between the existing Eldorado Substation and the Mountain Pass Substation. Path 1 for the Telecommunication System follows the route of the proposed transmission line and alternatives. As such, the existing condition is the same as described for the proposed transmission line and associated alternatives. Path 2 for the Telecommunication System is located throughout areas that are rural and undeveloped in nature, similar to the Proposed Project. Noise levels measured for the Proposed Project are considered to be similar to those for Path 2 of the Telecommunication System.

4.10.5 Environmental Impacts and Mitigation Measures

4.10.5.1 Project Impacts

Construction Impacts

The *Roadway Construction Noise Model User's Guide* (FHWA 2006) provides the most recent comprehensive assessment of noise levels from construction equipment. The average (L_{eq}) noise level at several distances are summarized in Table 4-41.

TABLE 4-41
CONSTRUCTION EQUIPMENT NOISE LEVELS FROM THE ROADWAY CONSTRUCTION NOISE MODEL USER'S GUIDE

Equipment Description	Acoustical Usage Factor (%)	Specified L_{max} @ 50 ft (dBA)	Calculated L_{eq} @ 100 ft (dBA)	Calculated L_{eq} @ 1000 ft (dBA)	Calculated L_{eq} @ 2000 ft (dBA)	Calculated L_{eq} @ 4000 ft (dBA)
All Other Equipment > 5 HP	50	85	76	56	50	44
Auger Drill Rig	20	85	72	52	46	40
Backhoe	40	80	70	50	44	38
Bar Bender	20	80	67	47	41	35
Blasting	-- N/A --	94	88	68	62	56
Boring Jack Power Unit	50	80	71	51	45	39
Chain Saw	20	85	72	52	46	40
Clam Shovel (dropping)	20	93	80	60	54	48
Compactor (ground)	20	80	67	47	41	35
Compressor (air)	40	80	70	50	44	38
Concrete Batch Plant	15	83	69	49	43	37
Concrete Mixer Truck	40	85	75	55	49	43
Concrete Pump Truck	20	82	69	49	43	37
Concrete Saw	20	90	77	57	51	45
Crane	16	85	71	51	45	39
Dozer	40	85	75	55	49	43
Drill Rig Truck	20	84	71	51	45	39
Drum Mixer	50	80	71	51	45	39
Dump Truck	40	84	74	54	48	42
Excavator	40	85	75	55	49	43
Flat Bed Truck	40	84	74	54	48	42
Front End Loader	40	80	70	50	44	38
Generator	50	82	73	53	47	41
Generator (<25 kVA, VMS signs)	50	70	61	41	35	29
Gradall	40	85	75	55	49	43
Grader	40	85	75	55	49	43
Grapple (on backhoe)	40	85	75	55	49	43
Horizontal Boring Hydr. Jack	25	80	68	48	42	36
Hydra Break Ram	10	90	74	54	48	42
Impact Pile Driver	20	95	82	62	56	50
Jackhammer	20	85	72	52	46	40
Man Lift	20	85	72	52	46	40
Mounted Impact Hammer	20	90	77	57	51	45

TABLE 4-41 CONSTRUCTION EQUIPMENT NOISE LEVELS FROM THE ROADWAY CONSTRUCTION NOISE MODEL USER'S GUIDE						
Equipment Description	**Acoustical Usage Factor (%)**	**Specified L_{max} @ 50 ft (dBA)**	**Calculated L_{eq} @ 100 ft (dBA)**	**Calculated L_{eq} @ 1000 ft (dBA)**	**Calculated L_{eq} @ 2000 ft (dBA)**	**Calculated L_{eq} @ 4000 ft (dBA)**
(hoe ram)						
Pavement Scarafier	20	85	72	52	46	40
Paver	50	85	76	56	50	44
Pickup Truck	40	55	45	25	19	13
Pneumatic Tools	50	85	76	56	50	44
Pumps	50	77	68	48	42	36
Refrigerator Unit	100	82	76	56	50	44
Rivet Buster/Chipping Gun	20	85	72	52	46	40
Rock Drill	20	85	72	52	46	40
Roller	20	85	72	52	46	40
Sand Blasting (Single Nozzle)	20	85	72	52	46	40
Scraper	40	85	75	55	49	43
Shears (on backhoe)	40	85	75	55	49	43
Slurry Plant	100	78	72	52	46	40
Slurry Trenching Machine	50	82	73	53	47	41
Soil Mix Drill Rig	50	80	71	51	45	39
Tractor	40	84	74	54	48	42
Vacuum Excavator (Vac-truck)	40	85	75	55	49	43
Vacuum Street Sweeper	10	80	64	44	38	32
Ventilation Fan	100	85	79	59	53	47
Vibrating Hopper	50	85	76	56	50	44
Vibratory Concrete Mixer	20	80	67	47	41	35
Vibratory Pile Driver	20	95	82	62	56	50
Warning Horn	5	85	66	46	40	34
Welder / Torch	40	73	63	43	37	31

Source*:* FHWA 2006.
Equation to calculated Lmax at 1,000, 2,000, and 4,000 feet is as follows:
$L_{eq}(h) = L_{max} + 10logU.F. - 20log(D/Do)$
where:

- L_{max} = Maximum noise emission level of equipment based on work cycle at distance Do, dB
- U. F. = Usage factor which accounts for the percent time that equipment is in use over the time period of interest (1 hour)
- D = Distance from the equipment to the receptor, feet
- Do = Reference distance at which the Lmax was measured for the equipment of interest, feet

Review of Table 4-27 indicates that the loudest equipment generally emits noise in the range of 80 to 90 dBA at 50 feet, with usage factors of 40 percent to 50 percent. Noise at any specific receptor is dominated by the closest and loudest equipment. The type and number of construction equipment near any specific receptor location would vary over time. In order to make reasonably conservative estimates of construction noise, a scenario was modeled consisting of the following:

- one piece of equipment generating a reference noise level of 85 dBA (at 50 feet distance with a 40 percent usage factor) located on the transmission line route or the substation property line

- two pieces of equipment generating reference 85 dBA noise levels located 50 feet farther away on the transmission line route or the substation property line

- two additional pieces of equipment generating reference 85 dBA noise levels located 100 feet farther away on the transmission line route or the substation property line

Construction equipment noise levels at various distances, based on this scenario, are presented in Table 4-42.

TABLE 4-42
CONSTRUCTION EQUIPMENT NOISE LEVELS VERSUS DISTANCE

Distance from Route or Substation Property Line (feet)	L_{eq} Noise Level (dBA)
50	83
100	79
200	74
400	69
800	63
1,600	58
3,200	52
6,400	46

In addition to the construction equipment discussed above, noise would be generated from the operation of a concrete batch plant and helicopters used for tower construction.

The existing concrete batch plant located off the I-15 freeway at the Yates Well Road interchange near the Primm Valley Golf Course would be used during construction. The facility is located approximately 0.5 mile from the Primm Valley Golf Club and 5 miles from the Desert Oasis Apartment Complex in Primm. The existing concrete batch plant was operating during the noise monitoring that was conducted at the golf club on November 20 and 21, 2008. Noise from the facility was not noticeable over the traffic noise from I-15.

If helicopters are used for transmission line tower construction, noise from the helicopters operated on a regular basis would be audible at staging areas, tower construction sites, and along flight paths. The helicopters would pick up the towers from the staging areas and place them at each location. With helicopters, tower placement would be performed in a relatively short time, with an average flying time of 4 to 6 minutes between two sites. For example, 24 towers for 220kV transmission lines could be constructed over a 6-mile span in a 2- to 3-day period (Department of Energy 2008).

In general, heavy-duty helicopters would be used during construction in remote locations. These locations would be less likely to be near populated areas than locations accessible by truck. Available data indicates that the sound exposure level (SEL) from the overflight of one heavy-duty helicopter flying at an elevation of 1,000 feet would likely be in the range of 85 dBA to 93 dBA. This corresponds to an hourly L_{eq} of 49 dBA to 57 dBA (SCAG 2007).

Light duty helicopters may also be used during construction. Light duty helicopters would be smaller and generate an SEL of 80 dBA to 85 dBA for an overflight at 1,000 feet elevation. This corresponds to an hourly L_{eq} of 44 dBA to 49 dBA for the light-duty helicopters.

Since helicopters would be used primarily in relatively remote undeveloped areas, the potential for disturbance to large numbers of residences is small. Because helicopter operations would be infrequent and of short duration, impacts would be limited to staging areas, construction sites, and along flight paths, and would be temporary in nature.

Operation Impacts

The proposed transmission line was evaluated for corona noise at four representative locations. Location 1, Desert Oasis Apartment Complex, is located within 0.01 mile of the proposed transmission line. Location 2, Primm Valley Golf Club, is located outside of the 0.5-mile buffer. Location 3, Ivanpah Lake, is located adjacent to recreational users of the area. Location 4, McCullough Pass, was selected because it is the highest elevation in the Project area and has the greatest transmission line activity along the proposed transmission line.

For the modeling input parameters, a 220kV double-circuit tower structure, 28-foot minimum ground clearance, and location specific elevations were used to demonstrate the most conservative corona noise results for the proposed transmission line. The modeling results for each location are shown below in Table 4-43. Accompanying graphs are provided in Appendix H.

Table 4-43 demonstrates that the modeled corona noise levels are all less than 30 dBA under worst-case foul weather conditions. In addition, substation noise was determined to be inaudible at the noise sensitive locations, given that the distance to the closest sensitive receptor, the Primm Valley Golf Club, is 2.4 miles.

TABLE 4-43
CORONA NOISE MODELING RESULTS SUMMARY (DBA)

Corona Noise Modeling Location	Weather Conditions	Directly under the tower	50 feet from center of tower	100 feet from center of tower	200 feet from center of tower
1 Desert Oasis Apartment Complex	Fair	2	0	0	0
	Foul	27	24	21	18
2 Primm Valley Golf Club	Fair	2	0	0	0
	Foul	27	24	21	18
3 Ivanpah Lake	Fair	2	0	0	0
	Foul	27	24	21	18
4 McCullough Pass	Fair	4	2	0	0
	Foul	29	27	24	21

Note: Results are calculated based on the Electric Power Research Institute (EPRI) EMF Workstation ENVIRO (version 3.52) modeling program. ENVIRO program results report as 0.0 dBA when corona noise calculations equal less than 0.1 dBA.

Maintenance Impacts

Maintenance activities associated with substations, transmission lines, and the Telecommunication System would typically result in noise levels below those associated with construction-related activities, and are anticipated to involve fewer pieces of heavy equipment, occur less frequently, and to be of shorter duration than construction activities. Maintenance activities are primarily inspection-related (for example, annual inspection of the transmission line from vehicles). Other maintenance activities, including washing of insulators to ensure proper function, would be conducted on an as-needed basis, but are anticipated to occur less than once per year.

Noise associated with maintenance activities is anticipated to be less than construction noise levels. Because the noise level estimates presented for construction are greater than the range of noise levels likely to be associated with maintenance activities, the construction noise assessments provided in this section adequately address the noise levels and potential impacts that would be associated with maintenance activities. As with construction noise, SCE would use noise reduction measures to be compatible with local plans and zoning to the extent practicable.

4.10.5.2 Transmission Lines

Proposed Transmission Line

Construction

Table 4-42 shows the estimated construction noise levels at varying distances. Residences near to the proposed transmission line are those located at the Desert Oasis Apartment Complex in Primm, Nevada. The apartments are located between 50 and 100 feet from the transmission line, which would result in noise levels during construction between 83 and 79 dBA, respectively. The apartment complex is separated from potential construction activities by an 8-foot solid concrete block wall. Typically, such a wall provides a minimum 5 to 10 dBA noise level reduction, provided it blocks the line of sight between the noise source and receiver. This would result in estimated construction noise levels between 69 and 78 dBA. Construction activities would be limited to daytime hours, and Clark County regulations provide an exemption to noise from daytime construction activities.

Noise impacts are expected to be temporary and local in nature. Activities that will occur in the vicinity of the apartment complex include removal of four existing towers and construction of four replacement towers. Tower removal may take up to 1 week, including the time it takes to remove four towers and remove the conductor. Up to three towers may be removed per day and a half day is required to remove the conductor. In the vicinity of the apartment complex, tower construction may take up to 2.5 weeks, including foundation work (approximately 4 days), steel haul (approximately 2 days), assembly (approximately 4 days), structure erection (approximately 2 days), and stringing the conductor (roughly 0.35 mile per day). The construction work may not be continuous; the timeframe is the cumulative duration of construction time.

Operation

Table 4-43 demonstrates that the modeled corona noise levels, including those levels modeled at the Desert Oasis Apartment Complex, are all less than 30 dBA under worst-case foul weather conditions.

Transmission Line Alternative A

Construction

Construction impacts for Transmission Line Alternative A would be the same as those described for the proposed transmission line.

Operation

Operation impacts for Transmission Line Alternative A would be the same as those described for the proposed transmission line.

Transmission Line Alternative B

Construction

Construction impacts for Transmission Line Alternative B would be the same as those described for the proposed transmission line.

Operation

Operation impacts for Transmission Line Alternative B would be the same as those described for the proposed transmission line.

Transmission Line Alternative C

Construction

Construction impacts for Transmission Line Alternative C would be the same as those described for the proposed transmission line, except that the existing transmission line which passes along the perimeter of the Desert Oasis Apartment Complex would be removed and not replaced in that location. Instead, that portion of the transmission line would be relocated to circle northwest around Primm. Therefore, construction in the vicinity of the apartment complex would be limited to removal of existing towers, and the potential duration of construction activities would be shortened to approximately 1 week.

Operation

Operation impacts for Transmission Line Alternative C would be the same as those described for the proposed transmission line, except that the existing transmission line that passes along the perimeter of the Desert Oasis Apartment Complex would be removed and not replaced in that location. Instead, that portion of the transmission line would be relocated to circle northwest around Primm. Transmission Line Alternative C would be located 0.67 mile from the apartment complex, and noise associated with alternative transmission line operation would not be present in the vicinity of the apartment complex.

Transmission Line Alternative D

Construction

Construction impacts for Transmission Line Alternative D would be the same as those described for the proposed transmission line, except that the existing transmission line which passes along the perimeter of the Desert Oasis Apartment Complex would be removed and not replaced in that location. Instead, that portion of the transmission line would be relocated to circle southwest around Primm. Therefore, construction in the vicinity of the apartment complex would be limited to removal of existing towers, and the potential duration of construction activities would be shortened to approximately 1 week.

Operation

Operation impacts for Transmission Line Alternative D would be the same as those described for the proposed transmission line, except that the existing transmission line that passes along the perimeter of the Desert Oasis Apartment Complex would be removed and not replaced in that location. Instead, that portion of the transmission line would be relocated to circle southwest around Primm. The transmission line would be located 0.57 mile from the apartment complex, and no noise associated with transmission line operation would be present in the vicinity of the apartment complex.

Transmission Line Alternative E

Construction

Construction impacts for Transmission Line Alternative E would be the same as those described for Alternative D, except that a small portion of the transmission line would be closer to the Desert Oasis Apartment Complex for Alternative E than for Alternative D.

Operation

Operation impacts for Transmission Line Alternative E would be the same as those described for the proposed transmission line, except that a small portion of the transmission line would be closer to the Desert Oasis Apartment Complex for Alternative E than for Alternative D. The transmission line would be located 0.57 mile from the apartment complex at its nearest point, and no noise associated with transmission line operation would be present in the vicinity of the apartment complex.

4.10.5.3 Substations

Eldorado Substation

Construction

Table 4-43 shows the estimated construction noise levels at varying distances. There are no residences near the Eldorado Substation that would be affected by construction noise. The nearest noise receptors, recreational users, would be located more than 3.5 miles from the Eldorado Substation, at which distance construction noise would likely be inaudible.

Operation

There are no residences near the Eldorado Substation that would be affected by operation noise. The nearest noise receptors would be recreational users, located more than 3.5 miles from the Eldorado Substation. The potential range in noise levels at 400 feet from the transformers varies from less than 39 dBA to 64 dBA and would not be audible at the closest sensitive receptors.

Ivanpah Substation

Construction

Table 4-42 shows estimated construction noise levels at varying distances. There are no residences near the Ivanpah Substation that would be affected by construction noise. The nearest noise receptors would be located at the Primm Valley Golf Club, a distance of more than 2.4 miles from the Ivanpah Substation, resulting in a potential noise level during construction of less than 46 dBA. The Ivanpah Substation would be located in San Bernardino County, where temporary construction noise is exempt from exterior noise level limits.

Operation

There are no residences near the Ivanpah Substation that would be affected by operation noise. The nearest residences would be located approximately 6.7 miles from the Ivanpah Substation. The nearest noise receptors would be located at the Primm Valley Golf Club, a distance of more than 2.4 miles from the Ivanpah Substation. The potential range in noise levels at 400 feet from the transformers varies from less than 39 dBA to 64 dBA and would not be audible at the closest sensitive receptors.

4.10.5.4 Telecommunication System

Construction

The noise impacts analysis provided for the proposed transmission line applies to construction of Path 1 of the Telecommunication System. Sensitive receptors for Path 2 of the

Telecommunication System include the Primm Valley Golf Club and a few residences along Highway 164 in the vicinity of Nipton, California. Potential construction impacts to the Primm Valley Golf Club would be the same as described for the proposed transmission line. Potential construction impacts for the residences along Highway 164 would be the same as described for the proposed transmission line in the vicinity of the Desert Oasis Apartment Complex.

Operation

Operation of the Telecommunication System is not anticipated to result in audible noise at any location.

Impact Evaluation

Would the Project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Construction Impacts

The proposed construction would comply with local noise ordinances. However, there may be a need to work outside the aforementioned local ordinances in order to take advantage of low electrical draw periods during the nighttime hours. SCE would comply with variance procedures requested by local authorities if required (NOI-1). Construction equipment would be in good working order (NOI-2). Construction equipment would be maintained per manufacturer's recommendations (NOI-3). Construction equipment would be adequately muffled (NOI-4). Idling of construction equipment and vehicles would be minimized during the construction (NOI-5). Construction activities would be limited to daytime hours consistent with local requirements. San Bernardino and Clark counties both exempt noise as a result of temporary construction from exterior noise level limits. Therefore, construction of the Proposed Project (including proposed transmission line, alternatives, substations, and Telecommunication System) would result in a less than significant impact under this criterion.

Operation Impacts

During the worst-case foul weather conditions, substation noise and corona noise associated with operation of the Proposed Project is anticipated to be just audible. This level is less than the standards in place by the noise ordinances of the two applicable counties. Therefore, the impacts from operation noise from the Proposed Project (including proposed transmission line, alternatives, substations, and Telecommunication System) would result in a less than significant impact under this criterion.

Maintenance activities would typically occur over short timeframes up to two times per month and generate minimal noise. As with construction noise, SCE would use noise reduction measures to be compatible with local plans and zoning to the extent practicable. Therefore, the impacts from maintenance noise due to implementation of the Proposed Project would result in a less than significant impact under this criterion.

Would the Project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Construction Impacts

Construction activities (e.g., ground disturbing activities, including grading and foundation excavation, and movement of heavy construction equipment) may generate groundborne vibration and noise. Pile-driving activities are typically the construction activity with the greatest potential to create groundborne vibration and noise, and pile driving is not anticipated as part of the Proposed Project. Workers would be provided appropriate hearing protection, if necessary, as described in the Health and Safety Plan (NOI-6).

Additionally, both groundborne vibration and noise would occur during daytime hours and be short-term and temporary. Therefore, construction of the Proposed Project would result in a less than significant impact under this criterion.

Operation Impacts

No ground-borne vibration or noise would be generated by the activities associated with operation, including maintenance, of the Proposed Project. Therefore, operation of the Proposed Project would result in no impact under this criterion.

Would the Project result in a substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project?

Construction Impacts

Noise from construction of the Proposed Project would be short-term and temporary and would result in no permanent increase in ambient noise levels; therefore, construction of the Proposed Project would result in no impact under this criterion.

Operation Impacts

During worst-case foul weather conditions, substation noise and the corona noise associated with operation of the proposed transmission line and alternatives is anticipated to be considerably less than existing noise levels. The minimum hourly L_{eq} measured at the nearest sensitive receptor, the Desert Oasis Apartment Complex, was 47 dBA (see Table 4-41). Modeling results indicate that during foul weather conditions (maximum noise conditions), corona noise levels will be 24 dBA. The sum of the two, the existing and future noise levels (47 dBA + 24 dBA) would be 47 dBA given the logarithmic nature of decibel addition. Therefore, no perceptible increase would occur and operation of the Proposed Project would result in a less than significant impact under this criterion.

Would the Project result in a substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project?

Construction Impacts

Any increases in ambient noise levels in the project vicinity will be short-term, intermittent, and temporary. Adverse construction noise impacts are not anticipated (e.g., nighttime construction or pile driving near residences), and SCE will ensure construction contractors comply with CalTrans Standard Specifications Section 7-1.01i and applicable local noise standards. In response to legitimate complaints, the contractor will implement appropriate additional noise minimization measures to reduce noise levels, including relocation of stationary construction equipment, turning off idling equipment, notifying adjacent residents in advance of construction work, and installing acoustic barriers around stationary construction noise sources, if feasible (NOI-1, NOI-4, NOI-5).

The Federal Transit Administration (FTA) provides guidelines for reasonable criteria for assessment of construction noise (FTA 2006). Construction noise that exceeds a 1-hour L_{eq} of 90 dBA or 8-hour L_{eq} of 80 dBA during the day would provoke adverse community reaction, according to the FTA. As discussed in Section 4.10.5.2.1, construction noise is not anticipated to exceed 78 dBA at the closest sensitive receptor, the Desert Oasis Construction Complex. Therefore, construction of the Proposed Project would result in a less than significant impact under this criterion.

Operation Impacts

During worst-case foul weather conditions, substation noise and the corona noise associated with operation of the proposed transmission line and alternatives is anticipated to be considerably less than existing noise levels. Therefore, operation of the Proposed Project would result in a less than significant impact under this criterion.

For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?

Construction Impacts

Construction of the proposed transmission line and transmission line alternatives would occur within 2 miles of the Jean Sport Aviation Center. Workers would be provided appropriate hearing protection, if necessary, as described in the Health and Safety Plan (NOI-6). Therefore, construction of the Proposed Project would result in a less than significant impact under this criterion.

Operation Impacts

The proposed transmission line and transmission line alternatives would be located within 2 miles of the Jean Sport Aviation Center and within the boundary of the Ivanpah Airport scheduled to open in 2017. Workers would be provided appropriate hearing protection, if necessary, as described in the Health and Safety Plan (NOI-6). Therefore, operation of the Proposed Project would result in a less than significant impact under this criterion.

For a project within the vicinity of a private airstrip, would the Project expose people residing or working in the Project area to excessive noise levels?

<u>Construction Impacts</u>

No private airstrips are located within 2 miles of the Proposed Project (Clark County 2008). Therefore, construction of the Proposed Project would result in no impact under this criterion.

<u>Operation Impacts</u>

No private airstrips are located within 2 miles of the Proposed Project (Clark County 2008). Therefore, operation of the Proposed Project would result in no impact under this criterion.

4.10.5.5 Mitigation Measures

Implementation of the Proposed Project would result in less than significant impacts during construction, operation, and maintenance; therefore, no mitigation is required.

4.10.6 <u>Evaluation and Comparison of Proposed and Alternative Routes</u>

There are less than significant impacts from noise for the proposed transmission line and the transmission line alternatives. However, there are slight variations between the proposed transmission line and three of the transmission line alternatives, as described below.

Transmission Line Alternative A. With regard to potential construction and operation noise impacts to sensitive receptors, Transmission Line Alternative A is similar to the Proposed Project. Therefore, implementation of Transmission Line Alternative A would result in a less than significant impact.

Transmission Line Alternative B. With regard to potential construction and operation noise impacts to sensitive receptors, Transmission Line Alternative B is similar to the Proposed Project. Therefore, implementation of Transmission Line Alternative B would result in a less than significant impact.

Transmission Line Alternative C. With regard to potential construction and operation noise impacts to sensitive receptors, Transmission Line Alternative C would relocate a portion of the proposed transmission line away from the nearest sensitive receptor (Desert Oasis Apartment Complex). As a result, it may be determined that Transmission Line Alternative C would have a reduced impact as compared to the Proposed Project. However, both the proposed transmission line and transmission line Alternative C would result in a less than significant impact.

Transmission Line Alternative D. With regard to potential construction and operation noise impacts to sensitive receptors, Transmission Line Alternative D would relocate a portion of the proposed transmission line away from the nearest sensitive receptor (Desert Oasis Apartment Complex). As a result, it may be determined that Transmission Line Alternative D would have a reduced impact as compared to the Proposed Project. However, both the proposed transmission line and transmission line Alternative D would result in a less than significant impact.

Transmission Line Alternative E. With regard to potential construction and operation noise impacts to sensitive receptors, Transmission Line Alternative E would relocate a portion of the proposed transmission line away from the nearest sensitive receptor (Desert Oasis Apartment Complex). As a result, it may be determined that Transmission Line Alternative E1 would have a reduced impact as compared to the Proposed Project. However, both the proposed transmission line and transmission line Alternative E would result in a less than significant impact.

Telecommunication Route Sections. There are less than significant impacts from noise for the Proposed Telecommunication System. However, there are differences between the two alternatives of Path 2, as described below.

At the junction of Highway 164 with I-15, Path 2-Section 3 of the Telecommunications System splits into two alternatives. Alternative 1 continues westward along Highway 164, then northwest to the Mountain Pass Substation and northeast to the Proposed Ivanpah Substation. Alternative 2 runs adjacent to the I-15, turning west towards the Proposed Ivanpah Substation north of the Primm Valley Golf Club. Because Path 2-Section 3-Alternative 2 runs adjacent to the Primm Valley Golf Club, this alternative has a noise receptor that Alternative 1 does not have. Consequently, Alternative 1 may have a reduced impact associated with short-term construction as compared to Alternative 2.

4.10.7 <u>References</u>

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4.11 POPULATION AND HOUSING

This section contains a description of existing conditions and the potential population and housing impacts associated with the construction and operation of the Proposed Project and alternatives.

4.11.1 Regulatory Setting

4.11.1.1 State

CEQA Title 14, Chapter 3, Article 9, Section 15126.2 contains the description of criteria for consideration and discussion of potentially significant environmental impacts. Pertaining to growth-inducing impacts, the discussion shall include the ways in which the Proposed Project could foster economic or population growth, or the construction of additional housing, as well as include content regarding projects which would remove obstacles to population growth.

Additionally, it will address how the increase in the population may tax existing community service facilities, requiring construction of new facilities that could cause potentially significant environmental effects.

4.11.1.2 Local

The following local plans were reviewed:

- County of San Bernardino 2007 General Plan: outlines standards and policy for unincorporated territory within San Bernardino County, California (County of San Bernardino 2007)

- Clark County Comprehensive Plan: outlines standards and policy for unincorporated territory within Clark County, Nevada (County of Clark 2008)

- Boulder City Master Plan: includes goals, policies, and programs used in making land use decisions for the future of the City of Boulder City, Nevada (City of Boulder City 2003)

4.11.2 Significance Criteria and Approach to Impact Assessment

4.11.2.1 Significance Criteria

Impacts on population and housing are considered potentially significant if the Project would:

- induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)

- displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere

- displace substantial numbers of people, necessitating the construction of replacement housing elsewhere

4.11.2.2 Applicant Proposed Measures

No APMs are proposed for population and housing.

4.11.2.3 Approach to Impact Assessment

The assessment of potential impacts to population and housing was conducted to address the CEQA significance criteria. The assessment was based on the potential impact of the Proposed Project on population and housing.

For this section, information was obtained directly from maps and the interpretation of aerial photographs, as well as from secondary sources which includes agency plans and census data. The impact assessment was conducted to identify the type and extent of impacts to population and housing affected by the Proposed Project.

4.11.3 Environmental Setting

4.11.3.1 Regional Setting

The Eldorado-Ivanpah Transmission Project area is located in the Mojave Desert of southern California and Nevada. Elements of the Proposed Project would be constructed in the immediate vicinity of unincorporated Mountain Pass, Nipton, and Wheaton Springs of San Bernardino County, California and Primm of Clark County, Nevada. Additional unincorporated areas that are in the Proposed Project area are Goodsprings, Jean, Ripley (Sandy Valley), and Searchlight of Clark County, Nevada. A portion of the Proposed Project would be constructed in the City of Boulder City of Clark County, Nevada.

4.11.3.2 Local Setting

San Bernardino County encompasses 20,052.50 square miles of land area, and has a population density of 85.2 persons per square mile (U.S. Census Bureau 2008). The population of San Bernardino County increased by 17 percent, from 1.7 million in 2000 to 2.0 million in 2006, according to the U.S. Census Bureau. The general plan for San Bernardino County (County of San Bernardino 2007 General Plan) contains projections that expect population to grow at a rapid pace, increasing to over 2,830,000 by the year 2020, an increase of almost 60 percent.

Clark County encompasses 7,910.34 square miles of land area and has a population density of 173.9 persons per square mile (U.S. Census Bureau 2008). The population of Clark County increased by 29.2 percent, from 1.4 million in 2000 to 1.8 million in 2006, according to the U.S. Census Bureau. The Clark County Comprehensive Plan contains projections that expect population to grow rapidly, increasing to almost 3,000,000 by the year 2020, an increase of almost 69 percent.

Table 4-44, Population and Housing, contains current statistics regarding Clark County and San Bernardino County population.

TABLE 4-44 POPULATION AND HOUSING		
	Clark County, Nevada	San Bernardino County, California
Population Estimate, 2006	1,777,539	1,999,332
Change in Population (by percent) April 1, 2000 to July 1, 2006	29.2%	17.0%
Population, 2000	1,375,765	1,709,434
Housing Units, 2006	756,161	668,377
Land Area (Square Miles), 2000	7,910.34	20,052.50
Persons Per Square Mile, 2000	173.9	85.2
Source: U.S. Census Bureau State and County QuickFacts Last Revised 25-July-2008		

As defined in the San Bernardino County General Plan, San Bernardino County contains three planning regions (Valley, Mountain, and Desert). The Proposed Project area is located within the Desert Planning Region, defined as including all of the unincorporated area of San Bernardino County lying north and east of the Mountain Planning Region. The Desert Planning Region, the largest of the three, includes a significant portion of the Mojave Desert and contains approximately 93 percent (18,735 square miles) of the land and less than 25 percent of the current population in San Bernardino County.

The Clark County Comprehensive Plan contains the Las Vegas Valley Community District Area and four Rural Planning Areas (Northeast, Northwest, South, and Laughlin). A majority of the Proposed Project area lies within the South County Rural Planning Area of Clark County. Clark County's current population which lives in the Eldorado-Ivanpah Transmission Project area of the South County Rural Planning Area (Goodsprings, Jean, Primm, Ripley [Sandy Valley], and Searchlight) is approximately 3,950 persons (County of Clark 2008). The Eldorado-Ivanpah Transmission Project area also lies within the Boulder City Annexation, which is within the Las Vegas Valley Community District Area. The population of Boulder City is 15,367 persons (County of Clark 2008), although this population is located within Boulder City proper and not within the Boulder City Annexation area.

4.11.4 Environmental Impacts and Mitigation Measures

4.11.4.1 Transmission Line, Telecommunications, and Substations - Construction and Operation Impact

Impact Analysis

Would the Project induce substantial population growth in an area, either directly or indirectly?

Construction Impact Construction of the Proposed Project and alternatives is not anticipated to induce population growth, but may result in short-term and temporary impacts to population and housing. The purpose of the Proposed Project is to serve the solar resource area with adequate utilities and improve communication ability among operations, as described in Chapter 1 of this document.

Work crews would likely commute daily from Boulder City, the Las Vegas Area, or San Bernardino County. Workers may require only a temporary need for accommodations. There are currently 2,579 hotel rooms in Primm; therefore, the Proposed Project construction would not substantially increase the demand for housing in the Project area and would not directly or indirectly induce population growth in the area.

Operation Impact SCE personnel would generally visit the transmission line routes for electrical switching and routine maintenance in a manner that is comparable to the existing maintenance schedule. Routine maintenance includes equipment testing, equipment monitoring and repair, as well as emergency and routine procedures for service continuity and preventative maintenance. Therefore, operation of the Proposed Project would not generate a large operation-related workforce that would require permanent housing. In addition, extending the electrical infrastructure to meet the demand for electricity is a result of, not a precursor to, development in the region.

Would the Project displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

Construction Impact*.* Construction of the Proposed Project would minimally affect population and housing in Boulder City and neighboring communities, and would not conflict with existing or planned housing. The Proposed Project would be constructed within existing SCE ROWs and laydown areas, existing substation sites, or on vacant land where housing does not currently exist. Therefore, construction of the Proposed Project would not displace existing housing or people.

Operation Impact*.* Operation activities would not displace any existing housing. The maintenance schedule would not require additional employee housing because operation would be similar to current procedures.

Would the Project displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

Construction Impact*.* Construction activities would occur at various locations along the transmission line routes over an approximate 8-month period. SCE's personnel and contractors (under the supervision of SCE personnel) would perform construction tasks required for the Proposed Project. There would be approximately 190 workers total, but crew size located on-site would vary upon the construction activity. This work force primarily would consist of workers who would commute to the various construction sites. Construction of the Proposed Project would not require a large temporary workforce that might displace existing housing or people, or necessitate relocation or the construction of replacement housing elsewhere.

Operation Impact*.* Operation of the Proposed Project is not anticipated to induce population growth. Operation of the transmission lines would allow SCE to continue to provide adequate service to current and future customers. After construction, the Proposed Project would operate as unstaffed facilities, and only occasional maintenance or emergency repairs would be required. The Project would not create any permanent on-site employment opportunities that could potentially require housing or displace people.

The Proposed Project would not require permanent housing; therefore, the operation of the Proposed Project would not directly or indirectly induce population growth in the area. Additionally, the operation of the Proposed Project would not displace any existing housing or people.

Mitigation Measures

Because population and housing impacts would be less than significant, no mitigation measures would be needed.

4.11.5 Evaluation and Comparison of Proposed Routes and Alternatives

According to CEQA significance criteria, the proposed Eldorado-Ivanpah Transmission Project would have a less than significant impact on population and housing. Impacts on population and housing resources for the Alternatives A, B, C, D, and E of the 220kV Transmission Line would be the same as for the Proposed Project. The Telecommunications Facilities and Alternatives 1 and 2 would have a less than significant impact. Impacts on population and housing resources would therefore be the same for the Proposed Project and the alternatives.

4.11.6 References

City of Boulder City. 2003. Master Plan.

County of Clark. 2008. General Plan.

County of San Bernardino. 2007. General Plan.

U.S. Census Bureau. 2008. State & County QuickFacts.

4.12 PUBLIC SERVICES

This section contains a description of existing conditions and the potential impacts on public services associated with the construction and operation of the Proposed Project and alternatives.

4.12.1 Regulatory Setting

4.12.1.1 Federal

Department of Interior, Bureau of Land Management

The Department of Interior, BLM, has exclusive jurisdiction on public lands in the project area and provides fire services. The BLM land use and management plans of the BLM's California

Desert District – Needles Field Office and the Southern Nevada District – Las Vegas Field Office are applicable to public lands in the Proposed Project area (BLM 2009).

4.12.1.2 State

The California Highway Patrol provides safety, service, and security to the people of California. Goals of the Highway Patrol are to: prevent loss of life, injuries, and property damage; maximize service to the public and assistance to allied agencies; manage traffic and emergency incidents; protect public and state assets; and improve departmental efficiency. (CHP 2009)

The Nevada Highway Patrol (NHP) promotes safety on Nevada Highways by providing law enforcement traffic services to the motoring public. The department's objectives are to: maintain average response time to highest priority calls, urban and rural; reduce severity rate of crashes on state highways; improve technology; improve harmony in the workplace; and increase grant funding and improve grants administration. (NHP 2009) The NHP has southern command substations which include local substations to the Proposed Project area such as Jean and Laughlin (NDPS 2009).

4.12.1.3 Local

Plans

SCE has considered local plans as part of the current environmental review process. The following local plans were reviewed:

- County of San Bernardino 2007 General Plan: outlines standards and policy for unincorporated territory within San Bernardino County, California (County of San Bernardino 2007)
- Clark County Comprehensive Plan: outlines standards and policy for unincorporated territory within Clark County, Nevada (County of Clark 2008)
- Boulder City Master Plan: includes goals, policies, and programs used in making land use decisions for the future of the City of Boulder City, Nevada (City of Boulder City 2003)

The San Bernardino County Sheriff's Department is the primary law enforcement agency for the County of San Bernardino (San Bernardino County Sheriff-Coroner Department 2009). The members of the Boulder City Police Department are committed to being responsive to the community. The objective of the Police Department is to improve the quality of life and enhance the spirit of the community through personalized services, citizen involvement, planning for the future and a commitment to timely action (Boulder City Nevada Police Department 2009).

The services that Clark County Fire Department provide include: urban and rural fire services, aircraft rescue fire fighting, emergency medical services (Paramedic Program), hazardous materials response team, technical rescue, fire prevention and investigation, disaster and emergency preparedness, and public education (Clark County Fire Department 2009). Clark County Code, Title 13 Fire and Fire Prevention, provides regulations for the safety and welfare of the public of Clark County (Clark County Code 2009).

The San Bernardino County Fire Department provides services for response to fire and incidents within the county. They specialize in many services such as their multiple household hazardous waste programs and vehicle services (San Bernardino County Fire Department 2009). San Bernardino County Code, Title 2, Division 3, Fire Protection and explosives and hazardous materials, contains regulations for the safety and welfare of the public of Clark County (San Bernardino County Code 2009).

The Boulder City Fire Department provides several fire safety programs to the community, such as, Cardiopulmonary Resuscitation (CPR), Fire Extinguisher Training, Smoke Detector and Battery Replacement Programs, and Fire Safety Home Inspections (Boulder City Fire Department 2009). The Boulder City (2006) Administrative Building Code, Boulder City Fire Code, contains fire regulations (Boulder City [2006] Administrative Building Code 2009).

4.12.2 Significance Criteria and Approach to Impact Assessment

4.12.2.1 Significance Criteria

Impacts on public services are considered potentially significant if the Proposed Project would:

- result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities. Additionally, impacts are considered potentially significant if there is a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services: fire protection, police protection, schools, parks, and other public facilities.

4.12.2.2 Applicant Proposed Measures

No APMs for public services are proposed.

4.12.2.3 Approach to Impact Assessment

The assessment of potential impacts on public services was conducted to address the CEQA significance criterion (see above), and was based on the potential impact of the Proposed Project on public services. The impact assessment was conducted to identify the type and extent of impacts on public services that are affected by the Proposed Project.

Potential impacts related to parks and recreation are discussed in Section 4.13, Recreation, of this PEA.

4.12.3 Environmental Setting

The environmental setting section includes a description of the public services in the study area for the Proposed Project. Information was obtained directly from maps and the interpretation of aerial photographs, and from secondary sources that include agency plans and other documents.

4.12.3.1 Regional Setting

The proposed Eldorado-Ivanpah Transmission Project area is located in San Bernardino County, California and Clark County, Nevada. Public services associated with the construction and operation of the Proposed Project and alternatives are described in the local setting.

4.12.3.2 Local Setting

The San Bernardino County Sheriff's Department provides law enforcement services to the area. The sheriff station is located in Barstow, California. In Clark County unincorporated areas, the Nevada Sheriff's Department provides law enforcement services with highway patrol. The Casinos in Primm have their own private security (Bowles 2009). In California, Station 53 provides firefighting services to the area, under the Baker North Desert Division. The fire department is located at 65 Kingston Circle in Baker, California. Fire protection is provided by the Clark County Fire Department. There is a small fire station in Jean and approximately 40.0 miles away there are full service fire stations (Bowles 2009). The BLM also services the Proposed Project area in fire protection. In Boulder City Annexation, police and fire services are provided by the city (Armantrout 2009). Both the sheriff and fire departments provide emergency services, primarily through the 911 response system. The Boulder City Hospital is the closest hospital to the Proposed Project, and is located approximately 20.0 miles northeast.

The Baker Valley Unified School District (BVUSD) is located in the San Bernardino County portion of the Proposed Project area. The BVUSD includes an elementary school, junior high school, and high school. The district serves approximately 213 students (BVUSD 2009). The schools in the district are located approximately 20.0 miles west of the Proposed Project area. The Clark County School District includes schools in the Proposed Project area such as: Sandy Valley Middle School with 245 students, Keystone Academy Charter High School with 48 students, Goodsprings Elementary with 9 students, and Harry Reid Elementary with 28 students (Public Schools Report 2009). Boulder City is part of the Clark County School District and there are no schools within the Annexation. There are no schools, within Nevada, that are within 0.5-mile radius of the Proposed Project.

4.12.4 <u>Environmental Impacts and Mitigation Measures</u>

Transmission Line, Substations, and Telecommunications

<u>Impact Analysis</u>

Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or

other performance objectives for any of the following public services: fire protection, police protection, schools, parks, and other public facilities?

Construction Impact

Construction activities associated with the Proposed Project and alternatives would not unduly burden local police or fire services. At the completion of the work day, construction crews would lock up and secure each worksite to prevent theft or vandalism associated with work equipment and supplies. Additionally, SCE would utilize private patrols to monitor all elements of the Proposed Project. Work crews also would minimize potential fire hazards through the implementation of standard SCE work plans. If required, public services such as police and fire would be provided by Clark County, San Bernardino County, and/or the Boulder City Sheriff's Department. However, construction of the Proposed Project would not significantly affect police and fire protection response times or create higher demand for these public services. Therefore, construction of the Proposed Project and alternatives would not require the provision of new or additional local police or fire services.

Construction of the Proposed Project may require the limited use of existing medical facilities in the area, in the unlikely event of an accident. However, as medical emergencies are expected to be minimal, potential medical emergencies among construction crews would not unduly burden the available hospitals or medical facilities. Therefore, construction of the Proposed Project and alternatives would not require the provision of new or additional medical facilities.

As discussed in Section 4.11 (Population and Housing) of this PEA, the construction of the Proposed Project would not cause a significant direct or indirect increase in the local population in the area, because the construction work force primarily would consist of commuting workers. Furthermore, construction activities would be temporary and short-term. Accordingly, the Proposed Project would not affect the enrollment or capacity of the schools within the surrounding area. Therefore, construction of the Proposed Project and alternatives would not require the provision of new or additional school facilities.

In summary, the Proposed Project and alternatives would not result in substantial adverse physical impacts on public services; therefore, the Proposed Project would have a less than significant impact during construction.

Operation Impact

SCE would use private patrol services to monitor the facilities in order to verify that all elements of the Proposed Project are safe and secure. Although unlikely, in the event of an emergency the private patrol services would contact local police or fire services. Therefore, the need for local police and fire services would be limited, and the Proposed Project would not require the provision of new or additional services. In addition, operation of the Proposed Project would not cause an increase in the local population. Therefore, the Proposed Project would not require the provision of new or additional medical or school facilities. The Proposed Project and alternatives would not result in substantial adverse physical impacts on public services and therefore Project operation impacts would be less than significant.

Mitigation Measures

In summary, construction and operation impacts related to public services would be less than significant; therefore no mitigation measures are proposed.

4.12.5 Evaluation and Comparison of Proposed Routes and Alternatives

The proposed Eldorado-Ivanpah Transmission Project would have a less than significant impact on public services. Alternatives A, B, C, D, and E and the proposed route of the 220kV Transmission Line would not result in adverse impacts on public services. The Telecommunications Facilities and Alternatives 1 and 2 would have a less than significant impact. Impacts on public services for the alternatives would be the same as for the Proposed Project.

4.12.6 References

Armantrout, Brok. 2009. Boulder City Community Development Director. Phone Conversation with Daniela A. Jara. January 22.

Baker Valley Unified School District (BVUSD). 2009. http://www.baker.k12.ca.us/baker.htm

BLM. 2009. http://www.blm.gov/wo/st/en.html

Boulder City (2006) Administrative Building Code. 2009. http://www.bcnv.org/Community Development/mediavault/2006%20Administrative%20Building%20Cod

Boulder City Fire Department. 2009. http://www.bcnv.org/FireDepartment/

Boulder City Nevada Police Department. 2009. http://www.bcnv.org/PoliceDepartment/

Bowles, Joy. 2009. Primm Welcome Center Supervisor. Phone Conversation with Daniela A. Jara. January 22.

California Highway Patrol (CHP). 2009. http://www.chp.ca.gov/html/mission.html

City of Boulder City. 2003. Master Plan.

Clark County Code. 2009. http://municipalcodes.lexisnexis.com/codes/clarknv/

Clark County Fire Department. 2009. http://fire.co.clark.nv.us/(S(w235xczl044nbn 45enr3rh21))/ Overview.aspx

County of Clark. 2008. General Plan.

County of San Bernardino. 2007. Comprehensive Plan.

Nevada Department of Public Safety (NDPS). 2009. http://nhp.nv.gov/south/SC_Substations.shtml

Nevada Highway Patrol (NHP). 2009. http://nhp.nv.gov/mission.shtml

Public Schools Report. 2009. http://schools.publicschoolsreport.com.

San Bernardino County Code. 2009. http://www.co.san-bernardino.ca.us/countycodes/

San Bernardino County Fire Department. 2009. http://www.sbcfire.org/about_us_sbcfd.asp

San Bernardino County Sheriff-Coroner Department. 2009. http://www.co.san-bernardino.ca.us/sheriff/index.asp

4.13 RECREATION

This section contains a description of existing conditions and the potential impacts on recreation resources associated with the construction and operation of the Proposed Project and alternatives. The section identifies public and private recreation that could be adversely affected by the Proposed Project.

4.13.1 Regulatory Setting

4.13.1.1 Federal

The FLPMA recognizes that it is the policy of the United States that the public lands be managed in a manner which will provide for outdoor recreation.

The Recreation and Public Purposes Act authorizes the sale or lease of public lands for recreational or public purposes to state or local governments or qualified non-profit organizations.

Public lands have inherent recreational value and offer some level of opportunities for recreational activity. SCE has considered federal management plans as part of the current recreational review process. The following federal plans were reviewed:

- The California Desert Conservation Area Plan and Final Environmental Impact Statement (BLM 1980, 1999)
- Proposed Northern and Eastern Mojave Desert Management Plan (BLM 2002), Approved Amendment to the California Desert Conservation Area Plan and Final Environmental Impact Statement
- Proposed Las Vegas Resource Management Plan and Environmental Impact Statement (BLM 1998)
- Mojave National Preserve General Management Plan (NPS 2002)

4.13.1.2 State and Local

The Proposed Project is exempt from local land use and zoning regulations in California. However, because SCE is complying with CPUC regulations governing T/Ls, CPUC GO. No. 131-D, Section XIV. B requires the utility to consult with local agencies regarding land use matters. The GO 131-D requires the submission of the location of parks, including map(s) showing locations of parks. SCE has considered local land-use and zoning plans as part of the current recreation review process. The following local plans were reviewed:

- <u>County of San Bernardino 2007 General Plan</u>: outlines standards and policy for unincorporated territory within San Bernardino County, California (County of San Bernardino 2007)

- <u>Clark County Comprehensive Plan</u>: outlines standards and policy for unincorporated territory within Clark County, Nevada (County of Clark 2008)
- <u>Boulder City Master Plan</u>: includes goals, policies, and programs used in making land use decisions for the future of the City of Boulder City, Nevada (City of Boulder City 2003)

4.13.2 <u>Significance Criteria and Approach to Impact Assessment</u>

4.13.2 Significance Criteria

The assessment of potential impacts on recreation was conducted to address the CEQA significance criteria. Impacts to recreation are considered potentially significant if the Project would:

- increase the use of existing neighborhood and regional parks or other recreational facilities, such that substantial physical deterioration of the facility would occur or be accelerated

- include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment

4.13.2.2 Applicant Proposed Measures

The following applicant proposed measure would be implemented for recreation resources.

REC-1. Recreation Area Closures. When temporary short-term closures to recreational areas are necessary for construction activities, SCE would coordinate those closures with recreational facility owners. To the extent practicable, SCE would schedule construction activities to avoid heavy recreational use periods (e.g., holidays or tournaments). SCE would post notice of the closure on-site 14 calendar days prior to the closure.

4.13.2.3 Approach to Impact Assessment

The assessment was based on the potential impact of the Proposed Project on public and private recreation. The Project's consistency with applicable management plans and general plans was also considered in the assessment.

The impact assessment was conducted to identify the type and extent of impacts on recreation affected by the Proposed Project. Impacts were evaluated in a study area defined to be within a radius of approximately 0.5 mile of the Proposed Project facilities.

4.13.3 Environmental Setting

The environmental setting section includes a description of the existing conditions and the public and private recreation in the study area for the Proposed Project. For this section, information was obtained directly from maps, the interpretation of aerial photographs, and from secondary sources, including agency plans and other documents.

4.13.3.1 Regional Setting

As shown in Figures 4.9-1 and 4.9-2 (located in Map Volume), the proposed Eldorado-Ivanpah Transmission Project is located in San Bernardino County, California and Clark County, Nevada. The majority of the Proposed Project area, within the Mojave Desert, is under federal jurisdiction which is managed by the BLM.

There are public and private recreational areas within the Eldorado-Ivanpah Transmission Project area. Public recreation areas are often widely dispersed recreation areas that do not take place in a specific setting. Dispersed recreation is the principal opportunity available to visitors within the planning area. These opportunities include caving, photography, painting, automobile touring, backpacking, bird watching, hunting, primitive camping, hiking, rock climbing, and competitive and non-competitive off-road vehicle events. The Mojave National Preserve and BLM land provide opportunities for dispersed recreation.

Ivanpah Dry Lake has been specifically designated for non-motorized open-space recreational activities in the BLM's CDCA Desert Plan. It is a Special Recreation Management Area (SRMA). Ivanpah Lake has access routes on the northeast and northwest side and there is an information kiosk on the east side. The Desert Wildlife Management Area is an overlay to Ivanpah Lake that is south of the Proposed Project and alternatives and east of I-15. There are staging areas that allow for camping and a southern boundary that does not permit sailing south of the line. BLM issues approximately 250 casual use permits per year for recreational activities on the Ivanpah Dry Lake (BLM Recreation 2009).

Roach Dry Lake is managed as a SRMA that provides intensive recreation opportunities, including competitive off-road vehicle (in accordance with the U.S. Fish and Wildlife Service Biological Opinion) and other recreational events, as well as dispersed recreational use and commercial activities.

Private recreation areas are often organized recreation areas that take place in a specific setting. The Primm Valley Golf Club is an opportunity for private recreation within the planning area. In Primm, there are commercial resort facilities which include swimming pools and a roller coaster.

There are no identified planned developments of recreational areas according to maps, aerial photographs, and secondary sources, including agency plans and other documents. Federal, state, and local plans did not provide planned development.

4.13.3.2 Local Setting

Proposed Transmission Line

The proposed Route would cross the Boulder City Annexation within Clark County, for approximately 6.0 miles. This area contains desert land, utilities, and energy facilities. The Boulder City Master Plan designates this area as Energy, Utility and Preserve, containing recreation on designated recreation trails. BLM land would be crossed for approximately 28.0 miles. Public land, managed by the BLM, contains dispersed recreational opportunities. The proposed Route would be within 0.5 mile of Roach Lake for approximately 5.0 miles. The proposed Route would enter from the east side of I-15, and would cross a northern portion of Ivanpah Lake for approximately 2.0 miles on the west side of I-15. According to the BLM, the Ivanpah Lake allows for archery, kite buggying, and land sailing. The Lake is closed to motorized vehicles (BLM 2009). The proposed Route would cross Primm, Clark County for approximately 1.0 mile. The unincorporated area of Primm contains recreational uses within commercial facilities. Approximately 2.0 miles east of the proposed Ivanpah Substation and approximately 0.5 mile southeast of the proposed Route, in San Bernardino County, is the Primm Valley Golf Club.

Transmission Line Alternative A (Segment Parallel to Desert Wildlife Preserve Line)

Alternative A, about 5.0 miles in length, would be within the Boulder City Annexation. According to the Boulder City Master Plan, recreation opportunities are limited to dispersed recreation on designated recreation trails.

Transmission Line Alternative B (North of Eldorado)

Alternative B, approximately 5.3 miles in length, is within the Boulder City Annexation and crosses lands containing dispersed recreational opportunities in designated areas.

Transmission Line Alternative C (North Dry Lakes Reroute)

Alternative C, approximately 5.2 miles in length, would cross BLM land which is open to the public. The recreational opportunities are dispersed. Alternative C would be within 0.5 mile of and adjacent to Ivanpah and Roach Lakes which provide recreational opportunities. The alternative would also be within 0.5 mile of Primm which provides recreation within its commercial uses.

Transmission Line Alternative D (South Dry Lakes Reroute)

Alternative D would cross BLM land for 3.2 miles, which allows for public, dispersed recreation. The alternative would cross a northern portion of Ivanpah Lake for approximately 1.0 mile and would be within 0.5 mile of Roach Lake and Primm. Ivanpah Lake, Roach Lake, and Primm have recreation opportunities.

Transmission Line Alternative E

Alternative E would cross private land for 0.7 mile, and there are no existing or planned recreational resources in the immediate area. There are recreational opportunities within 0.5 mile, located in Primm. Ivanpah Lake, Roach Lake and other BLM lands are also within 0.5 mile and provide recreation.

Substations

Ivanpah Substation

The proposed Ivanpah Substation, a 38.5-acre vacant parcel on BLM land, would be located approximately 6.0 miles west of the state line in unincorporated San Bernardino County. There are public, dispersed recreational opportunities on BLM land.

Eldorado Substation

The existing Eldorado Substation is within the Boulder City Annexation. Energy, Utility, and Preserve are current and future land designations. The Boulder City Annexation provides dispersed recreation on designated trails.

Telecommunication System

Path 2-Section 1 Eldorado-Lugo 500kV Transmission Line Route

The Eldorado-Lugo 500kV Transmission Line Route would cross the Boulder City Annexation for approximately 6.0 miles, which contains dispersed recreation on designated recreation trails. The Line would cross BLM land for approximately 20.0 miles, which contains opportunities for public, dispersed recreation.

Path 2-Section 2 Segment from the Eldorado-Lugo 500kV Transmission Line to the Unincorporated Area of Nipton (New Line)

The New Line, approximately 5.0 miles in length, would cross (east-west) BLM land for about 4.5 miles. Immediately south, for approximately 3.0 miles, there would be the Mojave National Preserve. Dispersed recreation opportunities are available on BLM land and the Preserve.

Path 2-Section 3-Alternatives 1 and 2 Segment from Unincorporated Area of Nipton to I-15 Junction Point (New Line and Nipton 33kV)

Nipton 33kV (approximately 1.0 mile in length) and New Line (approximately 9.0 miles in length) would cross and would be adjacent to BLM land. There are dispersed recreation opportunities on BLM land. The Ivanpah Lake would be crossed which does not permit recreation use in the southern vicinity of the Lake. The Mojave National Preserve is adjacent (within 0.5 mile) and provides opportunities for dispersed recreation opportunities.

Path 2-Section 3-Alternative 1 Segment from I-15 Junction Point to Ivanpah Substation (Nipton 33kV and New Line)

Alternative 1 would cross BLM lands for approximately 14.5 miles. There are dispersed recreational opportunities on BLM land and in the adjacent Mojave National Preserve.

Path 2-Section 3-Alternative 2 Segment from I-15 Junction Point to Ivanpah Substation (Nipton 33kV and New Line)

Alternative 2, approximately 10.0 miles in length, would cross BLM land. East of the proposed Ivanpah Substation and west of the I-15, the route would generally run parallel to the southern border of the Primm Valley Golf Club. This golf course provides private, organized recreation while dispersed recreation is available along the remainder of the transmission line.

Path 2-Section 3A: Proposed Micro Wave Route

This route would include a proposed Ivanpah substation location and a Nipton location for the construction of the towers. The micro wave tower at Ivanpah substation would not require additional land because it would be part of the substation facility. There are public, dispersed recreational opportunities on BLM land.

4.13.4 Environmental Impacts and Mitigation Measures

4.13.4.1 Transmission, Telecommunications, and Substations - Construction and Operation

Temporary and short-term impacts during construction would include potential limitation of access to recreation trails or areas. The APM, REC-1 Recreation Area Closures, would be implemented if such closures are required. The following analysis is in regards to the CEQA checklist.

Impact Analysis

Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities, such that substantial physical deterioration of the facility would occur or be accelerated?

Construction Impact

Construction of the Proposed Project and alternatives is not anticipated to increase the use of existing neighborhood and regional parks or other recreational facilities because there would be no additional recreational users. Work crews would likely commute daily from Boulder City, the Las Vegas Area, or San Bernardino County. Workers may require only a temporary need for accommodations and not require recreation resources.

Operation Impact

SCE personnel would generally conduct routine maintenance in a manner that is comparable to the existing maintenance schedule. The workers would not increase the local population, and therefore operation of the Proposed Project would not impact recreational opportunities.

Would the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

Construction Impact

The Project would not include recreational facilities due to the lack of population increase. The Project has a purpose to serve SCE's solar resource area with adequate utilities and improve communication ability among operations. The Project would not create any permanent on-site employment opportunities that could potentially require recreation resources.

Operation Impact

Project operation would not include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment. Maintenance and emergency repairs would require workers to provide a short-term visit.

Mitigation Measures

Because impacts on recreation would not occur, according to the CEQA criteria, no mitigation measures would be needed.

4.13.5 Evaluation and Comparison of Proposed Routes and Alternatives

The proposed Eldorado-Ivanpah 220kV Transmission project would have no long term impact on recreational use. There may be short term and temporary impacts that are less than significant. Considering CEQA criteria, impacts to recreation resulting from the alternatives would be substantially the same as the impacts resulting from the Proposed Project.

Alternative C may potentially avoid impacts on Ivanpah Lake recreational uses because it would pass around, not cross, the Lake. Regardless, the existing 115kV transmission line is passing through the Lake so the tear down may potentially limit access. Alternative D and E may potentially limit access more so than the other alternatives because Ivanpah Lake would have two paths of construction, possibly present at the same time.

4.13.6 References

BLM. 2002. Proposed Northern and Eastern Mojave Desert Management Plan, Amendment to the California Desert Conservation Area Plan and Final Environmental Impact Statement

_____. 1998. Proposed Las Vegas Resource Management Plan and Environmental Impact Statement

_____. 1980, 1999. California Desert Conservation Area Plan and Final Environmental Impact Statement

_____. 2009 [access date]. http://www.blm.gov/ca/st/en/fo/needles/ivanpah.html

_____. Recreation. 2009 [access date]. Ivanpah Solar Energy Generating System; Recreation.

City of Boulder City. 2003. Master Plan

County of Clark. 2008. General Plan

County of San Bernardino. 2007. Comprehensive Plan

Mojave National Preserve General Management Plan (U.S. NPS 2002).

4.14 TRANSPORTATION AND TRAFFIC

This section contains a description of existing conditions, as well as potential impacts on transportation and traffic from construction and operation of the Proposed Project and alternatives.

4.14.1 Regulatory Setting

4.14.1.1 Federal

The Code of Federal Regulations (CFR) is the codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the federal government. It is divided into 50 titles, representing broad areas subject to federal regulation. CFR, Title 49, Subtitle B includes 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. CFR, Title 14, Part 77 establishes standards for determining physical obstructions to navigable airspace (CFR 2008). Refer to Section 4.9 Land Use and Planning (4.9.1.1 Federal) for further description of Federal Regulation Title 14, Part 77.

4.14.1.2 State

California Vehicle Code (CVC) includes regulations pertaining to: licensing, size, weight, and load of vehicles operated on highways; safe operation of vehicles; and the transportation of hazardous materials (CVC 2008).

Nevada Vehicle Code (NVC) consists of NRS and Nevada Administrative Code (NAC) pertaining to Motor Vehicles. Regulations pertaining to safety, licensing, size, weight, and hazardous materials are listed in these documents (NVC 2008).

California Streets and Highway Code include regulations for the care and protection of state and county highways, as well as provisions for the issuance of written permits (California Law 2008).

CalTrans manages more than 45,000 miles of California's highway and freeway lanes, provides inter-city rail services, permits more than 400 public-use airports and special-use hospital heliports, and works with local agencies. CalTrans carries out its mission of improving mobility across California with six primary programs: Aeronautics, Highway Transportation, Mass Transportation, Transportation Planning, Administration, and the Equipment Service Center (CalTrans 2008).

The NDOT is responsible for the design, construction, maintenance, and operation of the Nevada State Highway System, as well as the portion of the National and Interstate Highway System within the state’s boundaries (NDOT 2008).

4.14.1.3 Local

The San Bernardino Associated Governments, or SANBAG, Regional Transportation Plan identifies public policies and strategies for the transportation system in the San Bernardino County region (SANBAG 2008).

Clark County and San Bernardino County General Plans establish regional transportation objectives, policies, and implementation measures for various modes of transportation (County of Clark 2008 and County of San Bernardino 2007).

Clark County and San Bernardino County Code address transportation and traffic. These Codes address permitting requirements for oversize/overweight vehicles and outline regulations for the health, safety, and welfare of the people (Clark County 2008 and San Bernardino County 2008).

The Boulder City Master Plan (Plan) contains a section regarding transportation and mobility. Mobility, efficiency, and safety are components focused on in order to address the transportation system. The Plan identifies a series of policies that represent the community's vision for a transportation system. It provides direction for property owners, elected and appointed community leaders, and city staff and administrators in making well-coordinated land use and transportation decisions (City of Boulder City 2003).

4.14.2 <u>Significance Criteria and Approach to Impact Assessment</u>

4.14.2.1 Significance Criteria

Impacts on traffic and transportation are considered potentially significant if the project would:

- cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)
- exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways
- result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks
- substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)
- result in inadequate emergency access
- result in inadequate parking capacity
- conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)

4.14.2.2 Applicant Proposed Measures

The following APMs would be implemented.

TRA-1. Obtain Permits. If any work requires modifications or activities within local roadway and railroad ROWs, appropriate permits will be obtained prior to the commencement of construction activities, including any necessary local permits and encroachment permits.

TRA-2. Traffic Management and Control Plans. Traffic control and other management plans will be prepared where necessary to minimize Project impacts on local streets and railroad operations.

TRA-3. Minimize Street Use. Construction activities will be designed to minimize work on, or use of, local streets.

In addition, LU-1 may apply (see Section 4.9 Land Use and Planning, 4.9.3):

> **LU-1. Aeronautical Considerations.** SCE would submit notice to the FAA electronically, in accordance with FAA procedures, and as far in advance of construction as possible.

4.14.2.3 Approach to Impact Assessment

The assessment was based on the potential impact of the Proposed Project and alternatives on transportation and traffic. The assessment of potential impacts on transportation and traffic was conducted to address the CEQA significance criteria listed above. The impact assessment was conducted to identify the type and extent of impacts to transportation and traffic affected by the Proposed Project and alternatives.

4.14.3 Environmental Setting

For this section, information was obtained directly from maps and the interpretation of aerial photographs, and from secondary sources including agency plans and applicable traffic counts.

4.14.3.1 Regional Setting

As shown in Figures 4.9-1 and 4.9-2 (located in Map Volume), the proposed Eldorado-Ivanpah Transmission Project would be located in the Mojave Desert in Clark County, Nevada and San Bernardino County, California, passing the California-Nevada border. The Proposed Project site is located in a primarily undeveloped and sparsely populated area. This area is served by I-15, other highways, and local streets. The proposed Eldorado-Ivanpah Project would primarily follow ROWs that pass through the desert; not along the highway systems or local streets. However, construction and maintenance personnel and vehicles would use transportation systems in the area.

The Proposed Project area is served by I-15, a major north-south divided freeway through the San Diego, Riverside, and San Bernardino counties in California, and Clark County in Nevada. It is a major thoroughfare for traffic between Southern California, Las Vegas, Nevada, and points beyond. The Nevada portion of I-15 begins in Primm, and continues through Las Vegas and through north Clark County. The Average Annual Daily Traffic (AADT) volume on I-15 at the California/Nevada state line is 39,808, according to the Nevada Department of Transportation 2007 Annual Traffic Report. The AADT volumes on I-15 range from 39,000 to 40,000, between Cima Road (Milepost 162.73) in California and the state line (CalTrans 2007). According to NDOT, I-15 at the state line has an average weekday AADT volume of 33,415 and an average weekend AADT volume of 48,066.

State Route 164 is a state highway in southern Clark County, Nevada. The route, which is Nipton Road in California, connects the small unincorporated area of Nipton, California to U.S. Route 95 in Nevada and I-15 just south of Primm, Nevada. The route is also known as Nipton Road and was formerly designated SR 68. At SR 164, 1.1 miles west of U.S. 95, the 2007 annual average daily traffic count is 740 (NDOT 2007).

Construction workers commuting to the project site would use interstates, state highways, and local roadways. U.S. 95 in Nevada is a divided highway between Laughlin Junction and Boulder City. State Route 161 runs along Goodsprings Road, from Goodsprings to I-15 at Jean. State Route 604 has been bypassed by I-15, and serves mainly local traffic. Roadways in Boulder City and those located within the unincorporated areas of Jean, Mountain Pass, Nipton, Primm, and Wheaton Springs may also be used. These surface roads are primarily for local traffic and would have no planned usage. There are no other major surface roads available in the Proposed Project area.

According to the Las Vegas Resource Management Plan, OHV use is permitted on public lands in the Proposed Project area. OHV areas, managed by the BLM, are limited to existing roads, trails, and dry washes in portions of the Proposed Project area. Other OHV areas, with greater sensitive lands, are limited to designated roads and trails. OHV use, in the California portion of the Proposed Project area, is permitted on designated open routes of travel and it is not permitted in designated wilderness areas (Roan 2009). No off road driving is permitted in the Mojave National Preserve (NPS 2002)

The existing Jean Airport is located in the Proposed Project area, approximately 5 miles north of the proposed 220kV Transmission Line route. Also known as Jean Sport Aviation Center, it is a public airport mainly used for sports aviation such as for gliders and sky diving (AirNav.com 2008). Jean Airport is owned and operated by the Clark County Department of Aviation.

The FAA and the BLM are currently preparing an Environmental Impact Statement for a proposed Ivanpah Valley Airport (VHB 2008), also known as the SNSA. The Clark County Department of Aviation owns the land boundary, which is reserved for the proposed airport.

An active UPRR line bisects the proposed 220kV Transmission Line route and the Telecommunication System. In the Project area, the railroad is parallel to the I-15 in Nevada and parallel to the state line in California. The railroad crosses through the east side of the Ivanpah Cooperative Management Area, which is reserved for the development of the proposed Ivanpah Valley Airport.

4.14.3.2 Local Setting

Proposed Transmission Line

The proposed route of the 220kV transmission line would cross I-15 on the west side of the California/Nevada border. The route would bisect the UPRR line north of the Bighorn Electric Generating Station, approximately 2.0 miles east of the state line. At the nearest distance, the proposed route is approximately 4.5 miles south of the Jean Airport, and approximately 0.5 mile south of the southeast corner of the proposed Ivanpah Valley Airport property boundary. The locations of the airport facilities and runways within the proposed Ivanpah airport property boundary have not been determined.

Transmission Line Alternative A and B

Alternative A is approximately 13.0 miles east of the Jean Airport and 13.5 miles east of the proposed Ivanpah Valley Airport, at the nearest point. Alternative B is approximately 17.0 miles east of the Jean Airport and approximately 17.5 miles east of the proposed Ivanpah Valley Airport.

Transmission Line Alternative C and D

Alternative C crosses the I-15 on the east side of the California/Nevada border and Alternative D on the west. Alternatives C and D are approximately 10.0 miles south of the Jean Airport and approximately 0.75 mile south of the proposed Ivanpah Valley Airport property boundary.

Transmission Line Alternative E

Alternative E is about approximately 10.0 miles south of the Jean Airport and 1.0 mile south of the proposed Ivanpah Valley Airport property boundary.

<u>Substations</u>

Ivanpah Substation

The proposed Ivanpah Substation, which would include a microwave tower about 180 feet tall, is approximately 2.5 miles west of the I-15, 7.0 miles west of the UPRR, 8.5 miles southwest of the proposed Ivanpah Airport, and 17.0 miles southwest of the Jean Airport.

Eldorado Substation

The existing Eldorado Substation is approximately 3.5 miles west of U.S. 95, 16.5 miles east of the UPRR line, 18.0 miles from Jean Airport, and 19.0 miles from the proposed Ivanpah Valley Airport property boundary.

<u>Telecommunication System</u>

The Telecommunication System would cross the I-15. Path 2-Section 2 would run parallel to SR 164/Nipton Road for approximately 5.0 miles. Path 2-Section 3-Alternatives 1 and 2 would run parallel to SR164/Nipton Road for approximately 10.0 miles. Alternative 1 and Alternative 2 would run parallel to I-15; Alternative 1 for 4.0 miles and Alternative 2 for 6.0 miles. The Nipton 33kV Line, Path 2-Section 3-Alternatives 1 and 2 would cross the UPRR near the unincorporated area of Nipton. Approximately 1.0 mile northeast of the unincorporated area of Nipton there would be a proposed Nipton Microwave tower that would be within 1.0 mile of SR 164/Nipton Road and the UPRR line. The Telecommunication System is approximately 15.0 miles south from the Jean Airport and approximately 6.0 miles south from the proposed Ivanpah Valley Airport.

4.14.4 Enviromental Impacts and Mitigation Measures

4.14.4.1 Impact Analysis

Transmission Line: Proposed 220kV Transmission Line and Alternatives A through E; Substations: Proposed Ivanpah and Existing Eldorado; and Telecommunication System

Would the Project cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?

Construction and Operation Impact

Construction traffic to and from the Proposed Project site would include crews and equipment for the transmission line construction, substation development, and telecommunication improvements. In total, it is estimated that up to 190 construction personnel and 204 vehicles would be required for the 8-month construction period. However, only a portion of this total would be used during a single construction phase. Following construction, operation and maintenance would be performed by existing SCE employees or contractors and would not require the addition of new workers or equipment.

Through coordination with CalTrans and NDOT, measures would be taken to minimize traffic delays along I-15 and SR 164/Nipton Road. Because the movement of heavy equipment and materials to various work sites and marshalling yards has the potential to cause temporary traffic delays, such activities would occur in off-peak hours, in order to avoid the morning and evening peak vehicular travel times on weekdays, to the extent possible (APM TRA-3). In addition, SCE would implement a traffic management plan, approved by the local jurisdiction, prior to commencing construction activities.

Once completed and operational, the Proposed Project would not generate vehicular trips in the area on a consistent basis. Periodic maintenance or emergency repairs might be required, should problems arise along the proposed lines. The crews required for maintenance and repairs of these lines would generate a very small number of trips. In summary, the Proposed Project would not cause a substantial increase in traffic in relation to the existing traffic load and capacity of the street system; therefore, the Proposed Project would have a less than significant impact during construction and no impact during operation.

Would the Project exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?

Construction and Operation Impact

All material for the 220kV Transmission Line, Substations, and Telecommunications System would be delivered by truck. The majority of the truck traffic would use major highway systems and be scheduled during off-peak traffic hours. Concrete truck deliveries might need to be made during peak hours, when footing work is being performed. Traffic caused by the construction of the Proposed Project would be temporary, short-term, and minimal. The traffic volumes that would be generated by activities associated with the construction of the Proposed Project would not significantly affect intersection or roadway operations in the area due to the limited number of trips that would be generated.

A majority of the activity for the Eldorado-Ivanpah Transmission Project would be located along ROWs in the desert. However, the Proposed Eldorado-Ivanpah Transmission Line Project would cross I-15 and SR 164, possibly resulting in traffic delays from construction activities occurring at these locations. SCE would be required to obtain encroachment permits from CalTrans and NDOT in order to complete construction activities that cross I-15 and SR 164 (APM TRA-1). Overall, the traffic increase, due to workers and supplies, would be less than significant relative to current traffic counts. The Proposed Project would not exceed a level of standard established by the county congestion management agency for designated roads or highways.

Since the Project would not substantially increase traffic, operation of the Transmission Project would not exceed a level of service established by the county congestion management agency for designated roads and highways. The Proposed Project would operate as unstaffed facilities, and only occasional maintenance or emergency repairs would be required. The Proposed Project would not create any permanent on-site employment opportunities that could potentially increase traffic. During construction, there would be a less than significant impact on transportation and traffic service standards, and there would be no impact during operation of the Proposed Project.

Would the Project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

Construction and Operation Impact

The Proposed Project would not result in a change in air traffic patterns, since it would not create a need for an increase or decrease in traffic levels. The proposed 220kV Transmission Line route and Alternatives C, D, and E would be located within 1.0 mile of the proposed Ivanpah Valley Airport's southern-most property boundary. The proposed route and alternatives are south of the existing 500kV transmission line and would likely be lower than the existing transmission line structures. Although the specific location of the air facilities is unknown, it is anticipated that the Proposed Project would not conflict with airport operation due to the implementation of APM LU-1 (see Section 4.9.3), and the potential for safety risks would be avoided. The proposed transmission line and alternatives would not create substantial safety risks, and therefore Project construction and operation impacts would be less than significant.

Would the Project substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Construction and Operation Impact

Various construction laydown areas would be utilized along the proposed 220kV Transmission Line and Telecommunication System to provide convenient storage and access for construction. If any work were to require modifications or activities within local roadway ROWs, appropriate local permits would be obtained prior to the commencement of construction activities (APM TRA-1). This process would involve the preparation of appropriate management plans and provisions to ensure local streets are not damaged, or that damage would be repaired (APM TRA-2). In the event that oversized loads or other special construction vehicles are utilized, appropriate permits and procedures would be followed to ensure that the equipment and materials are safely hauled and do not damage state or federal roadway facilities. The Proposed Project and alternatives would not increase hazards due to a design feature or incompatible use.

After construction, the Proposed Project would operate with similar maintenance schedules and uses as other existing transmission lines in the utility corridors. The Proposed Project would not require major modifications. Pertaining to hazards and incompatible uses, the Proposed Project construction and operation would have no impact on transportation and traffic.

Would the Project result in inadequate emergency access?

Construction and Operation Impact

It is not anticipated that the construction of the Proposed Project would require alterations to local roadways. However, if any work requires modifications or activities within the local road ROWs, appropriate local permits would be obtained. This process would involve the preparation of appropriate management plans and provisions to ensure that local streets are not damaged, or that any damage is repaired. If any work were to potentially limit access, permits would be obtained and plans would be implemented to ensure safety. The construction and operation of the Proposed Project could potentially slightly impact emergency access, and therefore impacts would be less than significant.

Would the Project result in inadequate parking capacity?

Construction and Operation Impact

During the construction of the Proposed Project, parking for construction workers would be accommodated on the substation sites or within SCE ROWs and laydown areas. Overall, the Proposed Project would not result in inadequate parking capacity.

Parking for routine maintenance of any of the components associated with the Proposed Project would be accommodated on substation sites or within existing SCE ROWs or laydown areas. There would be no impacts to parking capacity during construction and operation of the Proposed Project.

Would the Project conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?

Construction and Operation Impact

Construction of the Proposed Project would not conflict with adopted policies, plans, or programs supporting alternative transportation. There is no public transit service in the vicinity of the Project site. Amtrak serves the corridor via bus only, with service between Las Vegas and Los Angeles. Many private bus companies operate on demand for Primm Valley Golf Club customers, but there is no established regular schedule. There are no bicycle facilities in the Project area. Permits would be obtained in order to cross the railroad, and control plans would be implemented (APM TRA-1 and APM TRA-2). During construction and operation of the Proposed Project, there would be no impacts on alternative transportation policies, plans, or programs.

Mitigation Measures

Because transportation and traffic impacts would be less than significant, no mitigation measures would be needed.

4.14.5 Evaluation and Comparison of Proposed Routes and Alternatives

Construction impacts from the Proposed Project would be short-term and minimal, and there would be no impacts resulting from operation. The proposed 220kV Transmission Line route, Alternative A, and Alternative B would create fewer impacts on transportation and traffic resources than alternative routes C, D or E. Construction of the Project using the proposed Route, Alternative A, or Alternative B would take place in the same location across the I-15, but the alternative routes (C, D and E) would require two separate locations across the I-15. Although minimal and temporary, the construction of the Proposed Project using the alternative routes at the second highway crossing could potentially create a greater impact on traffic congestion than it would for the proposed route and Alternatives A and B. Such impacts, however, would be less than significant with the implementation of APMs TRA-1, TRA-2, and TRA 3.

During construction of the proposed Telecommunications Facilities, the Proposed Project could have a short-term impact on transportation and traffic due to the potential for traffic delays along roadways. Path 2-Section 3-Alternative 1 parallels I-15 in an east-west direction for approximately 4.0 miles and Alternative 2 parallels I-15 in a north-south direction for approximately 5.0 miles. Although not significant, potential impacts could be greater for construction of the Proposed Project and alternatives that parallel the transportation systems for greater distances. For any of the alternatives, impacts would be less than significant with the implementation of APMs TRA-1, TRA-2, TRA 3, and LU-1.

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4.15 UTILITIES AND SERVICE SYSTEMS

This section contains a description of existing conditions and the potential impacts on utilities and service systems associated with the construction and operation of the Proposed Project and alternatives.

4.15.1 Regulatory Setting

4.15.1.1 Federal

Code of Federal Regulations, Title 40, Part 258

The CFR is the codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the federal government. It is divided into 50 titles, representing broad areas subject to federal regulation. The purpose of CFR, Title 40, Part 258 is to establish minimum national criteria under the RCRA (or the Act), as amended, for all municipal solid waste landfill (MSWLF) units and under the CWA, as amended, for municipal solid waste landfills that are used to dispose of sewage sludge. These minimum national criteria ensure the protection of human health and the environment.

Resource Conservation and Recovery Act Subtitle D

Sections 5.14.2.1, 5.14.4.2.1, and 5.14.6 regulate design and operation of solid waste landfills. Solid waste will be collected and disposed of by a collection company in conformance with Subtitle D. Solid waste in the Proposed Project area is regulated by California Integrated Waste Management Board (CIWMB) and Nevada Division of Environmental Protection, Solid Waste Branch (Nevada).

Clean Water Act (CWA)

Sections 5.14.4.2, 5.14.2.1, and 5.15 control discharge of wastewater to the surface waters of the U.S. SCE will comply with CWA requirements. Typically, all regulatory requirements are implemented by the State Water Board through RWQCBs established throughout each state.

4.15.1.2 State

California Public Utilities Commission General Order 131-D (California)

CPUC's review of transmission line applications takes place under two concurrent and parallel processes:

(3) environmental review pursuant to the CEQA

(4) review of project needs and costs pursuant to Public Utilities Code Sections 1001 et seq. and General Order 131-D

CPUC GO 131-D: "Rules relating to the planning and construction of electric generation, transmission/power/distribution line facilities and substations located in California" - states that no electric public utility shall begin construction in the state of California of any new electric generating plant, or of the modification, alteration, or addition to an existing electric generating plant, or of electric transmission/power/distribution line facilities, or of new, upgraded or modified substations without first complying with the provisions of this GO. For purposes of this General

Order, a transmission line is a line designed to operate at or above 200kV. A power line is a line designed to operate between 50 and 200kV. A distribution line is a line designed to operate under 50kV. More information on General Order 131-D requirements can be found in Attachment A, GO 131-D Checklist.

Public Utilities Commission of Nevada

The construction of a utility facility, defined as a transmission line that is 200kV or more, requires a permit by the Public Utilities Commission of Nevada under the UEPA according to the NRS 704.820 through 704.900. However, the replacement of an existing facility with a like facility, as determined by the Commission, does not constitute construction of a utility facility (NRS 704.865).

California Integrated Waste Management Act

California Integrated Waste Management Act (CIWMA) controls solid waste collectors, recyclers, and depositors. The Proposed Project's solid waste will be collected and disposed of by a collection company in conformance with the CIWMA.

Nevada Division of Environmental Protection Bureau of Waste Management

There are three Solid Waste Management Authorities, each of which administers State solid waste management regulations, including permitting and enforcement, in their areas of jurisdiction: the Clark County Health District, the Washoe County District Health Department and the NDEP. The NDEP has direct jurisdiction over all counties outside of Clark and Washoe and also has limited responsibilities to oversee the Health Districts' solid waste programs. The Solid Waste Branch has a staff of six, two of which are dedicated to waste reduction, reuse and recycling programs (NDEP 2009).

Permits are required for municipal and industrial solid waste disposal sites. The MSWLF regulations follow the federal requirements of 40 CFR Part 258. Permits are also required for incinerators and municipal solid waste compost plants. Other solid waste management facilities, such as transfer stations and other processing sites, are subject to a simpler "approval process" before they can be established.

4.15.1.3 Local

Plans

SCE has considered local plans as part of the current environmental review process. The following local plans were reviewed:

- County of San Bernardino 2007 General Plan: outlines standards and policy for unincorporated territory within San Bernardino County, California (County of San Bernardino 2007)

- Clark County Comprehensive Plan: outlines standards and policy for unincorporated territory within Clark County, Nevada (County of Clark 2008)
- Boulder City Master Plan: includes goals, policies, and programs used in making land use decisions for the future of the City of Boulder City, Nevada (City of Boulder City 2003)

Clark County Code

Ordinances related to Clark County franchises include; ROWs management, cable television, ambulance, monorail, cable company business license, public utilities, solid waste management, and franchises for street railway, electric light, heat, power, gas, water, telephone, and telegraph in counties and unincorporated towns.

5.01.080 ROWs License Agreement Conditions. A ROWs license agreement may be granted by the County Commission to a public utility to construct, operate, and maintain its system in specific streets and ROWs as authorized routes for non-subscription service only. The approval of a ROWs license by the County Commission and its acceptance by the applicant shall be reflected by execution of a ROWs license agreement. A ROWs license agreement shall incorporate all provisions of this chapter. In addition to authorized routes initially approved in the ROWs license agreement, the county manager may approve expansion of a ROWs licensees authorized routes upon written request from the ROWs licensee, if he finds that space is available in those ROWs, there are no applicable street cut limitations, and the proposed expansion would not interfere with existing or planned public improvements in those ROWs.

9.04.060 Unlawful disposal of solid waste—Identification of violator. It is unlawful for any person to throw or deposit, or cause to be thrown or deposited, in any street, alley, gutter or highway within the limits of the county, any solid waste or recyclables. No person shall throw, or cause to be thrown, or deposited, any solid waste, industrial waste, or hazardous waste, or recyclables upon the property or premises or into the receptacles of another, within the limits of Clark County; nor shall any person place, deposit, or accumulate, or cause to be placed, deposited or accumulated, any solid waste or recyclables in such a manner, or permit the same to remain on his premises, in such condition so that the same may be blown or carried over to public or other private property by any means whatsoever; nor shall any person throw, dump or deposit or cause to be thrown, dumped or deposited any solid waste or recyclables in any areas, including vacant lots, yards and any desert areas, of the county not authorized or licensed for deposit of these materials. Identification of the owner of any solid waste which is disposed of in violation of this section creates a reasonable inference that the owner is the person who disposed of the solid waste. The fact that the disposal of the solid waste was not witnessed does not, in and of itself, preclude the identification of its owner.

San Bernardino County Code

(a) Except for those persons exempt from the permit requirement pursuant to § 33.0824 of this Article, it shall be unlawful for a person or entity to operate a refuse collection or transportation activity, garbage hauling activity or nondomestic waste hauling activity within the incorporated or unincorporated areas of the County without possessing the current health and safety permit to do so issued by the Department of Public Health, Division of Environmental Health Services

(DEHS) and having paid fees to DEHS, as set forth in Chapter 2 of Division 6 of Title 1 of the San Bernardino County Code. Possession of such a permit does not excuse or substitute for compliance with other laws or regulations applying to solid waste handling operations, including, without limitation, Division 6 of Title 4 of the San Bernardino County Code.

It shall be unlawful for any person or entity to pump or otherwise remove the contents of a septic tank, seepage pit, cesspool, sewage holding tank, portable toilet, grease interceptor, or other receptacle of sanitary wastes or to transport sanitary wastes without an unexpired, unsuspended, unrevoked permit issued by the San Bernardino County DEHS and having paid all fees specified in the San Bernardino County Code Schedule of Fees. All procedures in Chapter 2 of Division 3 of Title 3 of the San Bernardino County Code relating to permits/hearings apply to this Article except as provided herein.

4.15.2 Significance Criteria and Approach to Impact Assessment

4.15.2.1 Significance Criteria

Impacts on utilities and service systems are considered potentially significant if the Project would:

- exceed wastewater treatment requirements of the applicable RWQCB
- require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects
- require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects
- result in insufficient water supplies available to serve the Project from existing entitlements and resources, or require new or expanded entitlements
- result in a determination by the wastewater treatment provider, which serves or may serve the Project, that it has inadequate capacity to serve the Project's projected demand in addition to the provider's existing commitments
- be served by a landfill with insufficient permitted capacity to accommodate the Project's solid waste disposal needs
- not comply with federal, state, and local statutes and regulations related to solid waste

Potential impacts related to storm water drainage facilities are discussed in Section 4.8, Hydrology and Water Quality.

4.15.2.2 Applicant Proposed Measures

The following APMs would be applied prior to and during construction, in association with the proposed Eldorado-Ivanpah Transmission Project. These APMs address potential construction issues with high-pressure gas pipelines. According to the BLM LR2000, a system which provides reports on BLM land and mineral use authorizations, there are several major pipeline companies which own and operate high-pressure pipelines (BLM LR2000 2009). These APMs are summarized below as Public Utility Services (PUSVCs) -01 and -02.

PUSVC-01. Work Around High Pressure Pipelines. No mechanical equipment will be permitted to operate within 3 feet of the high-pressure pipelines, and work within 3 feet must be done by hand or as otherwise directed by the pipeline company.

PUSVC-02. Monitoring by Pipeline Companies. A representative of applicable owners and operators of major pipeline companies must observe the excavation around or near their facilities to ensure protection and to record pertinent data necessary for operations.

4.15.2.3 Approach to Impact Assessment

The assessment of potential impacts on utilities and service systems was conducted to address the CEQA significance criteria (see above). The impact assessment was conducted to identify the type and extent of impacts on utilities and service systems affected by the Proposed Project.

4.15.3 Environmental Setting

The environmental setting section includes a description of the utilities and service systems in the study area for the Proposed Project. Information was obtained directly from maps and the interpretation of aerial photographs, and from secondary sources including agency plans and other documents.

4.15.3.1 Regional Setting

The proposed Eldorado-Ivanpah Transmission Project area is located in San Bernardino County, California and Clark County, Nevada. Utilities and service systems associated with the construction and operation of the Proposed Project and alternatives are described in the local setting. According to the LR2000, Cal Nev Pipeline Company, Kern River Gas Transmission Company, Kinder Morgan Energy Partners, Molycorp Inc., PRMA Land Development Company, Sempra Energy Resources, and Southwest Gas Corporation are major pipeline companies in the proposed Eldorado-Ivanpah Project area.

4.15.3.2 Local Setting

In San Bernardino County, SCE provides basic electrical service to residential and non-residential customers (SCE 2009). NV Energy Company provides electrical service to the Nevada portion of the Proposed Project (NV Energy 2009). Southern California Gas Company (subsidiary of Sempra Energy Co.) provides natural gas services and facilities within the Project area (California) (Southern California Gas 2009). Southwest Gas Corporation provides natural gas to a limited portion of the Project area that is within Nevada (Southwest Gas 2009). In the California portion of the Proposed Project area, AT&T provides telephone services, and cable television services require a satellite dish (Trocha 2009). On the Nevada side of the Proposed Project area, EMBARQ and Sprint provide telephone services, and Cheetah Communications provides wireless internet (Bowles 2009).

Water is supplied to the San Bernardino County portion of the Proposed Project area by Baker Community Services District, and Big Bend Water District supplies water to the Clark County portion of the Proposed Project area. Both Searchlight and Jean source their water from groundwater from the Ivanpah Alluvial Aquifer (San Bernardino County 2009; Clark County 2009). Boulder City provides water to the Annexation (Armantrout 2009). Wells provide water for a majority of the Proposed Project area in California and Nevada (San Bernardino County 2009; Clark County 2009).

Solid waste is handled by the Baker Community Collection Center (Baker 2009) in California, and the Republic Silverstate Disposal Service Inc., in Nevada (Brady 2009). Boulder City contracts a commercial contractor for trash services, which is Boulder Disposal (Armantrout 2009). San Bernardino County solid waste management owns and operates the county landfills (San Bernardino County 2009). The Clark County Sanitation District provides solid and wastewater collection (Clark County 2009).

Wastewater is managed by the City of San Bernardino Environmental Health Services. The unincorporated areas of San Bernardino County require septic systems, because there are no provided sewer services. The Las Vegas Valley Water District provides sewer services, while rural Clark County uses septic systems (San Bernardino County 2009; Clark County 2009). Boulder City Annexation uses septic systems (Armantrout 2009). Wastewater disposal facilities and services in the Project area are regulated by the Lahontan RWQCB in California and Clark County in Nevada (California Environmental Protection Agency 2009).

4.15.4 <u>Environmental Impacts and Mitigation Measures</u>

4.15.4.1 Transmission Line, Substations, and Telecommunications

<u>Impact Analysis</u>

Would the Project exceed wastewater treatment requirements of the applicable RWQCB?

Construction and Operation Impact

Construction and operation of the Proposed Project and alternatives would not exceed wastewater treatment requirements of the Lahontan RWQCB in California or Clark County in Nevada. The Proposed Project would not require significant wastewater disposal, and thus construction activities would not exceed wastewater treatment requirements. The Proposed Project and alternatives would not exceed wastewater treatment requirements of the applicable RWQCB; therefore, the Proposed Project would have a less than significant impact during construction and no impact during operation.

Would the Project require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Construction and Operation Impact

The Proposed Project would not require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities. The construction does not require a significant amount of wastewater, nor does the operation. During construction, there would be no impact on wastewater treatment facilities, and there would be no impact during operation of the Proposed Project.

Would the Project require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Construction and Operation Impact

The Proposed Project would not require wastewater treatment facilities, new stormwater drainage facilities, or expansion of existing facilities. The construction and operation does not require such facilities. The construction and operation of the Proposed Project and alternatives would have no impact.

Would the Project have insufficient water supplies available to serve the Project from existing entitlements and resources, or require new or expanded entitlements?

Construction and Operation Impact

Construction of the Proposed Project would not have insufficient water supplies available to serve the Project from existing entitlements and resources, or require new or expanded entitlements. The only demand for water would be for use by construction workers and water brought in for dust control. Potable water for drinking and portable restrooms would be brought in for construction, and disposed of accordingly. Non-potable water would be transported to the various construction areas for dust-suppression purposes. The Proposed Project and alternatives, during construction and operation, would have a less than significant impact on water supplies.

Would the Project result in a determination by the wastewater treatment provider, which serves or may serve the Project, that it has inadequate capacity to serve the Project's projected demand in addition to the provider's existing commitments?

Construction and Operation Impact

The Eldorado-Ivanpah Transmission Project would not result in a determination by the wastewater treatment provider which serves the Project that it has inadequate capacity to serve the Proposed Project's projected demand in addition to the provider's existing commitments.

The small number of workers in the Project area during construction would create a minimal and temporary increase of wastewater requirements. The construction and operation of the Proposed Project and alternatives would not impact wastewater treatment capacity, and therefore impacts would not be significant.

Would the Project be served by a landfill with insufficient permitted capacity to accommodate the Project's solid waste disposal needs?

Construction and Operation

Construction of the Proposed Project and alternatives would not be served by a landfill with insufficient permitted capacity to accommodate the Project's solid waste disposal needs. Limited waste materials would be generated, including materials associated with the construction and modification of transmission lines, telecommunication systems, and substations. Following installation of the new facilities, the existing 115kV structures would be removed completely (including the portion below ground surface). Depending on their condition, the structures to be replaced would be reused by SCE, returned to the manufacturer, disposed of in an approved landfill, or recycled. Scrap metal and wood generated during removal of the existing structures and overhead lines would be recycled, to the extent possible. Once the Proposed Project is operational, waste disposal will not be required. There would be no impact on landfills with insufficient permitted capacity during construction and operation of the Proposed Project.

Would the Project not comply with federal, state, and local statutes and regulations related to solid waste?

Construction and Operation Impact

Construction and operation of the Proposed Project would comply with all applicable federal, state, and local standards related to solid waste. During construction and operation of the Proposed Project, impacts would be less than significant.

Mitigation Measures

In summary, construction and operation impacts related to utilities and service systems would be less than significant; therefore, no mitigation measures are proposed.

4.15.5 Evaluation and Comparison of Proposed Routes and Alternatives

The proposed Eldorado-Ivanpah Transmission Project would have a less than significant impact on utilities and service systems. Alternatives A, B, C, D, and E and the proposed route of the 220kV Transmission Line would not result in adverse impacts on utilities and service systems. The Telecommunications Facilities and Alternatives 1 and 2 would have a less than significant impact. Impacts on utilities and service systems for the alternatives would be the same as for the Proposed Project.

4.15.6 References

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5.0 CUMULATIVE IMPACTS

SECTION 5.0
CUMULATIVE IMPACTS

5.1 INTRODUCTION

In accordance with CEQA (CEQA Guidelines Section 15130 et seq.), this section presents an analysis of cumulative impacts that may result from construction and operation of the Proposed Project. As defined in Section 15355 of the CEQA Guidelines, cumulative impacts refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. A cumulative impact “consists of an impact which is created as a result of the combination of the project evaluated in the [environmental document] together with other projects causing related impacts” (Section 15130[a][1]). Section 15130 (a)(3) also states that an environmental document might determine that a project’s contribution to a significant cumulative impact would be rendered less than cumulatively considerable, and thus not significant, if a project were to be required to implement or fund its fair share of mitigation measure(s) designed to alleviate the cumulative impact.

Cumulative impacts can result from individually minor but collectively significant projects taking place over time. When the combined cumulative impact associated with the Project’s incremental effect and the effects of other projects is not significant, the discussion shall briefly indicate why the cumulative impact is not significant and is not discussed in further detail.

5.2 PROJECTS ANALYZED FOR CUMULATIVE IMPACTS

The cumulative projects were identified based on data obtained from SCE, the BLM, and local jurisdictions. Over 42 present and reasonably foreseeable future projects have been identified in the area surrounding the Proposed Project. These projects include large-scale wind and solar farms, utility, transportation, mining, and other infrastructure projects. No residential or commercial projects were identified. The projects are listed in Table 5-1. Additionally, a number of existing utilities occur within the Project area. Existing transmission lines in the area include the Eldorado-Baker-Coolwater-Dunn Siding-Mountain Pass 115kV Transmission Line (which would be altered by the Proposed Project), Eldorado-McCullough 500kV Transmission Line, Mead-Victorville 287kV Transmission Line, McCullough-Victorville 1 500kV Transmission Line, McCullough-Victorville 2 500kV Transmission Line, Intermountain-Adelanto 500kV DC Transmission Line, Marketplace-Adelanto 500kV Transmission Line, Eldorado-Mead 220kV Transmission Line, Eldorado-Lugo 500kV Transmission Line (which would be modified for a telecommunication line as part of the Proposed Project), and Nipton 33kV transmission line. There are also electrical distribution lines in the Nevada portion of the study area, operated by the NV Energy Company. There are several existing gas pipelines in the area. Cal Nev Pipeline Company, Kern River Gas Transmission Company, Kinder Morgan Energy Partners, Molycorp Inc., PRMA Land Development Company, Sempra Energy Resources, and Southwest Gas Corporation are major pipeline companies in the proposed Eldorado-Ivanpah Project area (BLM LR2000 2008).

Other existing facilities in the area include the Eldorado and Mountain Pass substations, UPRR, I-15, U.S. Highway 95, SR 164/Nipton Road, numerous paved and unpaved roads; commercial, industrial, and residential development around the communities of Mountain Pass, Wheaton

Springs, and Nipton, California; development around Boulder City, Jean, Goodsprings, Primm, and Searchlight, Nevada.

TABLE 5-1
CUMULATIVE PROJECTS LIST

ID	Project Type	Project Proponent	Project Name	Approximate Project Size (acres unless otherwise noted)	Jurisdiction	Timeframe/ Status	Location
1	Wind Energy Facilities	Iberdrola Renewables, Inc.	CACA--044988	2,330	BLM/San Bernardino County	Authorized 8/07/2003	T15N R14E, T15 1/2N R14E
2	Wind Energy Facilities	Oak Creek Energy Systems	CACA--048666	22,864	BLM/San Bernardino County	Pending	T13N R17E, T14N R17E, T15N R17E, T29S R62E, T30S R62E, T30S R63E
3	Solar Energy Facilities	Solar Partners I, LLC	CACA--048668	6,720	BLM/San Bernardino County	Pending	T16N R14E, T17N R14E
4	Solar Energy Facilities	Gen 3 Solar, Inc, Optisolar, Inc	CACA--048669	4,160	BLM/San Bernardino County	Pending	T16N R14E, T17N R14E
5	Solar Energy Facilities	Boulevard Associates, LLC	CACA--049005	8,480	BLM/San Bernardino County	Pending	T14N R17E, T13N R17E
6	Solar Energy Facilities	Solar Partners IV, LLC	CACA--049502	524	BLM/San Bernardino County	Pending	T16N R14E, T17N R14E
7	Solar Energy Facilities	Solar Partners VIII, LLC	CACA--049503	1,666	BLM/San Bernardino County	Pending	T16N R14E, T17N R14E
8	Solar Energy Facilities	Solar Partners II, LLC	CACA--049504	2,625	BLM/San Bernardino County	Pending	T16N R14E, T17N R14E
9	Solar Energy Facilities	Solar Partners VIII, LLC	CACA--049508	1,666	BLM/San Bernardino County	Pending	T16N R14E, T17N R14E

TABLE 5-1
CUMULATIVE PROJECTS LIST

ID	Project Type	Project Proponent	Project Name	Approximate Project Size (acres unless otherwise noted)	Jurisdiction	Timeframe/ Status	Location
10	Wind Energy Facilities	Table Mountain Wind Co, LLC	NVN--073726	8,320	BLM/Clark County	Pending	T24S R58E, T25S R58E
11	Wind Energy Facilities	Boulevard Associates, LLC	NVN--081550	2,559	BLM/Clark County	Authorized 11/30/2007	T26S R64E
12	Wind Energy Facilities	Competitive Power Vent, Inc	NVN--082311	8,944	BLM/Clark County	Authorized 4/27/2007	T23S R59E, T24S R59E
13	Wind Energy Facilities	Nevada Power Company	NVN--082632	8,320	BLM/Clark County	Authorized 3/20/2007	T27S R62E
14	Wind Energy Facilities	Catamount Energy Corp.	NVN--082648	24,383	BLM/Clark County	Authorized 7/13/2007	T28S R63E, T28S R64E, T29S R63E, T29S R64E
15	Wind Energy Facilities	Oak Creek Energy Systems	NVN--082729	30,159	BLM/Clark County	Pending	T27S R61E, T28S R60E, T28S R61E, T28S R62 E, T29S R61E, T29S R62 E
16	Wind Energy Facilities	Laurence R. Greene	NVN--083041	11,570	BLM/Clark County	Authorized 3/06/2008	T24S R58E, T25S R58E
17	Solar Energy Facilities	Cogentrix Solar Services, LLC	NVN--083083	9,760	BLM/Clark County	Pending	T24S R59E, T25S R59E, T25S R60E, T25S R61E, T26S R59E, T26S R60E, T26S R61E

TABLE 5-1
CUMULATIVE PROJECTS LIST

ID	Project Type	Project Proponent	Project Name	Approximate Project Size (acres unless otherwise noted)	Jurisdiction	Timeframe/ Status	Location
18	Solar Energy Facilities	Cogentrix Solar Services, LLC	NVN--083129	19,840	BLM/Clark County	Pending	T24S R59E, T25S R59E, T25S R60E, T25S R61E, T26S R59E, T26S R60E, T26S R61E
19	Solar Energy Facilities	Cogentrix Solar Services, LLC	NVN--083130	4,480	BLM/Clark County	Pending	T29S R63E, T29S R64E
20	Solar Energy Facilities	Cogentrix Solar Services, LLC	NVN--083151	30,720	BLM/Clark County and San Bernardino County	Pending	T21S R54E, T21S R55E, T22S R54E, T22S R55E, T22S R56E
21	Solar Energy Facilities	Bright Source Energy Solar Partner	NVN--083481	12,000	BLM/Clark County	Pending	T24S R59E, T25S R59E, T25S R60E, T25S R61E, T26S R59E, T26S R60E, T26S R61E
22	Wind Energy Facilities	Searchlight Wind Energy Project	NVN--084626	24,383	BLM/Clark County	Pending	T28S R63E, T28S R64E, T29S R63E, T29S R64E
23	Solar Energy Facilities	Bull Frog Green Energy, LLC	NVN--085117	3,639	BLM/Clark County	Pending	T26S R63E
24	Solar Energy Facilities	Cogentrix Solar Services, LLC	NVN--085603	4,700	BLM/Clark County	Pending	T27S R59E

TABLE 5-1
CUMULATIVE PROJECTS LIST

ID	Project Type	Project Proponent	Project Name	Approximate Project Size (acres unless otherwise noted)	Jurisdiction	Timeframe/ Status	Location
25	Solar Energy Facilities	Cogentrix Solar Services, LLC	NVN--085619	12,000	BLM/Clark County	Pending	T24S R59E, T25S R59E, T25S R60E, T25S R61E, T26S R59E, T26S R60E, T26S R61E
26	Wind Energy Facilities	Desert Research Institute	NVN--085746	28	BLM/Clark County	Pending	T24S R58E, T25S R58E
27	Solar Energy Facilities	Bull Frog Green Energy, LLC	NVN--085774	3,177	BLM/Clark County	Pending	T25S R63E, T25S R64E
28	Solar Energy Facilities	Nextlight Renewable Power, LLC	NVN--085801	2,560	BLM/Clark County	Pending	T27S R59E
29	Solar Energy Facilities	Power Partners Southwest, LLC	NVN--086156	10,815	BLM/Clark County	Pending	T24S R59E, T25S R59E, T25S R60E, T25S R61 E, T26S R59E, T26S R60E, T26S R61E
30	Solar Energy Facilities	Power Partners Southwest, LLC	NVN--086158	3,885	BLM/Clark County	Pending	T26S R63E, T27S R63E
31	Communication Facilities - adding facilities to existing lease area	Royal Street Communications	P200800773/SP P-Cell	208 square feet of existing 4-acre facility area	San Bernardino County	accepted application	Nipton - State Highway 15 and Summit Road, southeast corner

TABLE 5-1
CUMULATIVE PROJECTS LIST

ID	Project Type	Project Proponent	Project Name	Approximate Project Size (acres unless otherwise noted)	Jurisdiction	Timeframe/ Status	Location
32	Mining - establishing a mining and reclamation plan on a 15-acre portion of 640 acres	U.S. Mining & Minerals Corp Sparkle Perlite Mine	AP20080042/SMAR	15	San Bernardino County	accepted application	Nipton - Nipton Road southwest on Walking Box Ranch Road 10 miles, then southeast 0.5 mile at stateline
33	Communication Facilities	Royal Street Communications/ Jeffrey Clark	P200800571/SPP-Cell	2,704 square feet on 23.48-acre area	San Bernardino County	accepted application	Nipton - Yates Well Road and 1-15, Northeast corner
34	Airport	Clark County	Ivanpah Airport	5,863	Clark County	2010-2013	Ivanpah Cooperative Management Area (south of Jean, Nevada and north of Primm, Nevada, in Roach Lake bed)
35	Highway - expansion joint repairs	NDOT	CL20080116-09	1.5 miles (estimated)	Clark County	FY2009	I-15, I-515, US 95 - various locations
36	Highway - guardrail replacement	NDOT	CL20080117-09	1.5 miles (estimated)	Clark County	FY2009	I-15, I-515, US 95 - various locations
37	Highway - install guardrail	NDOT	CL20090135-09	1 mile	Clark County	FY2009	SR 164/Nipton Road, 5 miles east of the state line

TABLE 5-1
CUMULATIVE PROJECTS LIST

ID	Project Type	Project Proponent	Project Name	Approximate Project Size (acres unless otherwise noted)	Jurisdiction	Timeframe/ Status	Location
38	Construct commercial vehicle enforcement facility and agricultural inspection facility; demolish existing facility	CalTrans	8-368501	4 miles	San Bernardino County	2010	I-15 near Wheaton Springs, East of Nipton Road to near Nevada state line/Yermo, East Yermo Road to Mineola Road
39	Highway - truck lane maintenance/construction	CalTrans	I-15 Mountain Pass Project - Yates Well Road to Bailey Road	12.1 miles	San Bernardino County	In progress/ Completion - Summer/ Fall 2010	I-15 - Yates Well Road to Bailey Road - south and north bound lanes
40	Solar Energy Facilities	Nextlight Renewable Power LLC	Nextlight Original Request	2,070	Boulder City, Nevada	Proposed and Actual	Within Boulder City townsite - north of Eldorado Valley Energy Resource Development District
41	Solar Energy Facilities	Dry Lake Bed Solar Site	Dry Lake Bed Solar Site	2,096	Boulder City, Nevada	Proposed and Actual	Within Boulder City townsite - north of Eldorado Valley Energy Resource Development District

TABLE 5-1
CUMULATIVE PROJECTS LIST

ID	Project Type	Project Proponent	Project Name	Approximate Project Size (acres unless otherwise noted)	Jurisdiction	Timeframe/ Status	Location
42	Solar Energy Facilities	various	Energy Resource Development District	2,131	Boulder City, Nevada	Proposed and Actual	Within Boulder City townsite - Eldorado Valley Energy Resource Development District
43	Solar Energy Facilities	Nextlight Renewable Power, LLC	Nextlight Amendment Request	2,395	Boulder City, Nevada	Proposed and Actual	Within Boulder City townsite - north of Eldorado Valley Energy Resource Development District

5.3 CUMULATIVE IMPACTS BY RESOURCE CATEGORIES

The following analysis addresses the potential for the Proposed Project to contribute to a cumulative impact based on other projects in the area. Consistent with CEQA Guidelines Section 15130, a project could have a significant cumulative impact if a change in the environment resulted from the incremental impact of the Proposed Project when added to other closely related past, present, and probable future projects. The following sections, organized by environmental resource category, discuss specific direct and indirect cumulative impacts that could occur as a result of the proposed and other projects in the area.

5.3.1 Aesthetic Resources

Construction and operation of the Proposed Project would result in less than significant impacts to visual resources as determined by use of the BLM VRM methodology, which evaluated project impacts against VRM Class II and Class III objectives.

Given the extensive geographic area of the Ivanpah and Eldorado valleys, only a subset of the cumulative projects described in Table 5-1 should be considered in conjunction with the Proposed Project when considering potential cumulative impacts for visual resources. Additionally, not all of the Project elements associated with the Proposed Project are new features in the landscape. Specifically, improvements at the Eldorado Substation require only an expansion within the fence line, and the transmission line itself is a replacement of an existing line. Therefore, only the proposed Ivanpah Substation represents a new feature in the landscape. Consequently, only those cumulative projects in the vicinity of the Ivanpah Substation (3, 4, 6, 7, 8, and 9) have the potential to result in a cumulative impact in combination with the Proposed Project. These specific projects combined represent approximately 17,360 acres of solar energy development. Environmental documentation for these projects has not been finalized and no permits for construction or operation have been issued.

In the absence of final specific project information for these other projects, it is anticipated that the other projects in the vicinity of the Proposed Project would avoid impacts where feasible or incorporate BMPs or other measures to reduce potential impacts to visual resources. On the basis of the less than significant impacts of the Proposed Project to visual resources, the incremental impact of the Proposed Project is not anticipated to combine with the impacts of other projects to result in significant cumulative impacts. The Proposed Project, in addition to the other planned projects in the vicinity, may result in an incremental change to the visual character and quality of the landscape near the Proposed Project. These incremental changes, when considered together, would not result in cumulatively considerable impacts.

5.3.2 Agricultural Resources

As discussed in Section 4.2, the Proposed Project would not require the conversion of land used in active agricultural operations. As a result, the Proposed Project would not contribute to any cumulative impact on agricultural resources.

5.3.3 Air Quality

Construction and operation of the Proposed Project would have a less than significant impact to air quality. Construction of the other projects listed in the cumulative impact analysis may contribute to adverse air quality, but the MDAQMD considered cumulative emissions when developing its thresholds of significance. During operation of the Proposed Project, emissions would be limited to those produced from vehicles during site visits occurring approximately three to four times per month. These intermittent visits would not contribute significantly to cumulative impacts to air quality.

5.3.4 Biological Resources

Cumulative biological impacts would be generally additive, and usually directly proportional to the amount of ground disturbed. Cumulative effects also depend, to some extent, on whether or not EITP construction activities are concurrent or overlapping in a given area. If construction is occurring concurrently, a higher volume of traffic may result and possibly greater amounts of ground disturbance would occur. Overlapping activity, on the other hand, may create disturbance to wildlife for a longer period of time, resulting in prolonged or permanent displacement of wildlife from crucial habitats. Where designated corridors are used, access roads may serve more than one line and would therefore minimize ground disturbance and limit the amount of increased access in some areas.

The analysis contained in Section 4.4 presented an evaluation of the Proposed Project with regard to sensitive plant and wildlife species in the Project area. The analysis determined that the Proposed Project would result in a less than significant impact to sensitive plant and wildlife species in the Project area because the majority of the Project would utilize an existing transmission ROW with existing access roads, project facilities will be sited outside of biologically sensitive areas, and mitigation measures (e.g., environmental training, biological monitors, preconstruction surveys, clearance surveys, and work area flagging) would be in place during construction. In addition, areas of temporary disturbance would be restored after the completion of construction. Therefore, potential cumulative biological resource impacts associated with the operation of the Proposed Project, along with future development, would not be cumulatively considerable.

5.3.5 Cultural and Paleontological Resources

As shown in Table 5-1: Cumulative Projects List, there are over 43 projects proposed or under development in the area surrounding the Proposed Project. These projects (mostly renewable energy generation projects) have the potential to affect cultural resources because ground-disturbing activities are necessary to construct the projects. Although the total number of cultural resources (NRHP-eligible and CRHR-eligible resources) that would be impacted as a result of construction of these projects is unknown, an order of magnitude estimate, based on the records search results for the Project (which provided information about the distribution of previously recorded cultural resources within a 1-mile buffer of the Project routes), would be 100 to 200 cultural resources.

Effects on cultural resources which are eligible for the NRHP or the CRHR would be significant if the impacts would demolish, destroy, or alter the resource or its immediate surroundings. The combined impacts from the proposed projects in the cumulative impact study area and the impacts on cultural resources from the Proposed Project would be significant without the APMs or mitigation measures. APMs for the Proposed Project impacts, consisting of avoidance or historical documentation and archaeological data recovery, would reduce impacts to less than significant levels. If the other proposed projects also implement similar measures following Section 106 regulations (36 CFR 800) and CEQA regulations [CCR Title 14, Section 15126.4(b)], potential cumulative impacts to cultural resources associated with the Proposed Project, in conjunction with other proposed projects in the Project area, would not be cumulatively considerable.

Approximately half of the 43 projects proposed or under development in the area surrounding the Proposed Project overlie areas of undetermined to high sensitivity for paleontological resources. These projects have the potential to impact paleontological resources because ground-disturbing activities are necessary to construct the projects. The combined impacts from the proposed projects in the cumulative impact study area and the impacts on paleontological resources from the Proposed Project may be significant without the APMs or mitigation measures. APMs for the Proposed Project impacts, consisting of monitoring, field survey, and data recovery, would reduce impacts to less than significant levels. If the other proposed projects also implement similar measures following NEPA regulations (United States Code, Section 4321 et seq.; 40 Code of Federal Regulations, Section 1502.25) and CEQA guidelines (Appendix G, Section (V) (c)), potential cumulative impacts to paleontological resources associated with the Proposed Project, in conjunction with other proposed projects in the Project area, would not be cumulatively considerable.

5.3.6 Geology, Mineral Resources, and Soils

Construction and operation of the Proposed Project would not have significant impacts to geology (including seismic), soils, and mineral resources. Construction and operation of the Proposed Project would ensure compliance with existing geology, seismic, and soils regulations; along with integration of standard operating procedures, APMs, and suggested mitigation measures, this would prevent potentially significant impacts. Future project development identified in the vicinity of the Proposed Project would be evaluated through the local permitting process to ensure regulatory compliance; would be subject to its own environmental review; and would be conditioned to incorporate APMs or mitigation measures to reduce potential impacts, to the extent feasible.

The projects evaluated in the cumulative impact analysis could cause ground surface disturbance; however, each project would be required to protect existing surficial materials/topsoil through compliance with then-existing regulations and by the implementation of project-specific SWPPPs and grading permits. Any known active mining operations or known locally important mineral resource recovery sites delineated on a local general plan, specific plan, or other land use plan within the cumulative project areas would require evaluation and appropriate protections to ensure the continued sufficient availability of mineral deposits. Therefore, potential cumulative geology, soils, and mineral resources impacts associated with the construction and operation of the Proposed Project, along with the identified future development, would not be cumulatively considerable.

5.3.7 Hazards and Hazardous Materials

Potential hazards to public health and safety resulting from future development projects in the Proposed Project vicinity would be evaluated through the local permitting process. As potential public health hazards are identified, either through the operation of a future project or through pre-existing site-specific hazards, mitigation measures or project changes would be implemented to avoid the potential impacts associated with those projects. The Proposed Project is not closely related to any past, present, or probable future project that, when combined with the Proposed Project, could create a cumulative impact to public health and safety. Therefore, potential cumulative public health and safety impacts associated with the operation of the Proposed Project, along with future development, would not be cumulatively considerable.

5.3.8 Hydrology and Water Quality

Construction and operation of the Proposed Project would ensure compliance with existing water quality regulations, as well as integration of standard operating procedures, and APMs, and suggested mitigation measures would prevent potentially significant impacts. Similarly, future development projects in the Proposed Project vicinity would be evaluated through the local permitting process to ensure regulatory compliance; would be subject to its own environmental review; and would be conditioned to incorporate APMs or mitigation measures to reduce potential impacts, to the extent feasible.

The projects evaluated in the cumulative impact analysis could affect desert washes and designated drainages; however, each project would be required to protect surface and groundwater quality and quantity, ensure flood protection, and minimize off-site flooding through compliance with then-existing regulations and by the implementation of project-specific SWPPPs and grading permits. Therefore, potential cumulative hydrology and water quality impacts associated with the construction and operation of the Proposed Project, along with the identified future development, would not be cumulatively considerable.

5.3.9 Land Use and Planning

General plans for local agencies and resource management plans for federal government have been adopted to govern the allowable uses and development in the vicinity of the Proposed Project. As shown in Table 5-1: Cumulative Projects List, there are over 42 projects proposed or under development in the area surrounding the Proposed Project. Each new development proposed within the area would be subject to the land use controls and development standards in effect at the time of Project submittal. Furthermore, each individual project would be subject to its own environmental review and would be conditioned to incorporate APMs or mitigation measures to reduce potential impacts, to the extent feasible. Compliance with the applicable land use controls and development standards would ensure that most potential land use impacts would remain less than significant.

While the Proposed Project is not required to comply with local land use regulations in California, the analysis contained in Section 4.9 presented an evaluation of the Proposed Project with regard to surrounding land use considerations. The analysis determined that the Proposed Project would result in a less than significant impact to land use and planning because the Project would not conflict with existing land use or planned land use. No cumulatively considerable impacts would occur as a result of the Proposed Project and other projects in the area.

5.3.10 Noise

Noise would be generated by the Proposed Project during construction and operation. Noise during construction would be generated by heavy equipment, construction vehicles, and general construction activities. Noise during operation would be generated by transformers at the Eldorado and Ivanpah substations, and corona noise would be associated with the Project transmission lines.

Cumulative projects are described in Section 5.2. The Proposed Project would result in the expansion of the Eldorado substation, which does not have nearby sensitive receptors. While there are projects proposed in the vicinity of the Eldorado Substation (projects 40-43, as described in Table 5-1), the projects are not in close enough proximity to the substation to create a cumulative effect either during construction or operation. The Proposed Project would also result in the construction and operation of the Ivanpah Substation, which would be located in the midst of a cluster of proposed projects (including projects 3, 4, 6, 7, 8, 9, and 33, as described in Table 5-1). Noise from the Ivanpah Substation is anticipated to be inaudible at the nearest sensitive receptor and would not be expected to contribute to cumulatively significant noise impacts. Corona noise associated with the transmission line between the Eldorado and Ivanpah substations would be less than 30 dBA under worst-case foul weather conditions. This noise level would not be cumulatively significant with other closely related past, present, and reasonably foreseeable future projects.

5.3.11 Population and Housing

The purpose of the Proposed Project is to serve SCE’s solar resource area with adequate utilities and improve communication ability among operations, as described in Section 1 of this document. The Proposed Project would not cause or require the development of new housing or result in an increase in population. Development projects in the vicinity of the Proposed Project could create a cumulative impact. However, the Proposed Project would not contribute to this impact. Therefore, potential cumulative impacts to population and housing associated with the Proposed Project, in conjunction with future development, would not be cumulatively considerable.

5.3.12 Public Services

Future residential construction in the vicinity of the Proposed Project could increase demand for public services (police services, fire services, public schools, hospitals, etc.). As discussed in Section 4.12, the Proposed Project would have a less than significant impact on public services. Therefore, impacts to public services resulting from the Proposed Project, along with past, present, and probable future development, would not be cumulatively considerable.

5.3.13 Recreation

The Proposed Project would not increase the use of parks or recreational facilities, nor would the Project result in the need to construct or expand recreational facilities in the area. A portion of the Proposed Project would occur within the Ivanpah Lake SRMA, within existing SCE ROWs, and a BLM-designated utility corridor. Construction activities might cause minimal, temporary impacts to recreational users utilizing this area. However, impacts to recreation resulting from the Proposed Project, along with past, present, and probable future development, would not be cumulatively considerable.

5.3.14 Transportation and Traffic

Construction and operation of the Proposed Project would not result in any potentially significant long-term traffic and/or transportation impacts. Various energy development projects are presently underway or would commence construction in the foreseeable future within the region of the Project area. Construction of these various projects might occur during construction of the Proposed Project. If so, temporary impacts on traffic during construction of the projects would result. Although the above-referenced projects and others might be constructed near the Proposed Project and during the same time-frame as the Proposed Project, the incremental contribution to traffic by SCE construction crews and vehicles using the same roadways would be minimal. There would be no long-term traffic and transportation impacts associated with operation of the Proposed Project. Therefore, impacts to transportation and traffic resulting from the Proposed Project, along with past, present, and probable future development, would not be cumulatively considerable.

5.3.15 Utilities and Service Systems

Construction of the Proposed Project would generate solid waste that either would be recycled or disposed of in approved landfills. Operation of the Proposed Project would not impact utilities and service systems. Therefore, potential impacts to utilities and service systems associated with the Proposed Project, along with past, present, and probable future development, would not be cumulatively considerable.

5.4 REFERENCES

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6.0 INDIRECT EFFECTS

SECTION 6.0
INDIRECT EFFECTS

6.1 INTRODUCTION

This section discusses CEQA Guidelines Section 15358 (a)(2) requirements for addressing potential indirect effects or indirect impacts of a Proposed Project. Indirect effects are defined as those impacts that are caused by the project and are later in time or farther removed in distance, but are still reasonably foreseeable. These effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems. This includes both construction and operation-related impacts.

6.2 BACKGROUND

The Proposed Project would allow planned new solar energy generation projects to interconnect the high-voltage transmission grid and deliver energy to the load centers. Because these new solar energy generation projects are independently proceeding forward through the FERC-mandated interconnection process, they are not caused by the Proposed Project. Instead, the Proposed Project is in response to the amount of new generation interconnection requests received from independent power producers. SCE and the California Independent System Operator (CAISO) have received numerous solar generation interconnection requests in different areas of SCE's service territory, including the Mohave Desert area. For the most part, new solar generation projects are driven by California's Renewables Portfolio Standard as discussed below[1].

6.2.1 <u>Renewables Portfolio Standard</u>

A RPS uses market mechanisms to ensure that a growing percentage of electricity is produced from renewable sources, like solar power. RPS requirements have been adopted in 21 States and the District of Columbia. The California RPS was established in 2002 by Senate Bill 1078.[2] The RPS requires investor-owned utilities, including retail sellers of electricity such as SCE, to increase their sale of electricity produced by renewable energy sources (such as solar) by at least 1 percent per year, achieving 20 percent by 2017 (at the latest). These requirements were accelerated by the passage of Senate Bill 107[3] to be consistent with the State of California's Energy Action Plan (EAP). The EAP adopted by CPUC, CEC, and the now defunct California Power Authority pledged that the agencies will accelerate RPS implementation to meet the 20 percent goal by 2010, instead of 2017. In order for investor-owned utilities, including retail sellers of electricity such as SCE, to satisfy these target goals, new transmission facilities will be required to interconnect remote areas with high concentrations of renewable generation. One of these remote areas is the Mohave Desert.

1 http://www.awea.org/legislative/pdf/PTC_Factsheet.pdf
2 SB1078 (Stats. 2002, Ch. 516), adding Article 16 (California Renewables Portfolio Standard Program) to the Cal. Pub. Util. Code § 399.11, *et seq.* (2004) (SB 1078).
3 SB 107, Chapter 464, Statutes of 2006. SB 107 amends pertinent provisions in Public Resources Code Sections 25740 through 25751 and Public Utilities Code Sections 399.11 through 399.16.

6.3 INDIRECT EFFECTS

Under the RPS program, the only way to increase the amount of renewable electricity generated per year is to construct and interconnect new renewable generation resources, such as the planned solar generation in the Eastern Mohave Desert. California law has fostered the development of more renewable resources which in turn requires new transmission to interconnect and deliver the energy to the load centers. For example, Senate Bill 1038 required the CPUC to prepare and submit, by December 1, 2003, a comprehensive transmission plan for renewable electricity generation facilities, to provide for the rational, orderly, cost-effective expansion of transmission facilities that may be necessary to facilitate the development of renewable electricity generation facilities.[4] The passage of legislation establishing the California RPS, and not the Proposed Project, has encouraged the development of additional wind projects in the Tehachapi area. The Proposed Project is necessary to interconnect and deliver renewable resources required to meet the State mandated RPS target goals and thus is itself an indirect effect of the RPS program.

As described in Section 7.0, the Proposed Project (and alternatives) would not be anticipated to induce growth. While the Proposed Project improves the overall system capability to adequately serve the existing and forecast load demand, it is not intended to supply power related to potential growth for any particular development. Residential, commercial, and industrial growth and residential population increases in the Los Angeles Basin are managed at the local and county levels and are anticipated to occur consistent with the general and specific plans approved by each jurisdiction (refer to Section 4.9.1.3 for a description of these approved plans). The development of the Proposed Project would not be expected to influence planned or future residential or commercial developments. Furthermore, the development of the Proposed Project would not be expected to cause any indirect impacts to land use, population density or growth rate, or any resultant impacts to natural systems. Therefore, no significant long term indirect effects would result due to implementation of the Proposed Project.

[4] http://www.cpuc.ca.gov/published/REPORT/32197.htm

7.0 GROWTH-INDUCING IMPACTS

SECTION 7.0
GROWTH-INDUCING IMPACTS

7.1 INTRODUCTION

The CEQA requires the analysis of a proposed project's potential to induce growth. Specifically, Section 115126.2(d) requires that environmental documents "…discuss the ways in which the Proposed Project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment…" Growth-inducing impacts can occur if a project would induce growth either directly or indirectly in the surrounding environment. Section 15126.2 (d) also states that it must not be assumed that growth in an area is necessarily beneficial, detrimental, or of little significance to the environment.

A project could be considered to have growth-inducing effects if it: (1) either directly or indirectly fosters economic or population growth or the construction of additional housing in the surrounding area; (2) removes obstacles to population growth; (3) requires the construction of new community facilities that could cause significant environmental effects; or (4) encourages and facilitates other activities that could significantly affect the environment, either individually or cumulatively. Growth-related impacts are those that occur later in time or are farther removed in distance, but which are still reasonably foreseeable.

A project's potential to induce growth does not automatically mean that it will result in growth. This potential growth-inducing effect is regulated by local governments in California through the development, adoption, and implementation of land use plans and policies intended to avoid or minimize the growth inducing potential or pressure created by projects, both individually or cumulatively. Growth occurs through capital investment in new economic opportunities from both public and private entities. Development occurs as a result of economic investment in a particular region. New economic (i.e., employment) opportunities will naturally create the need for infrastructure to support an increased population.

7.2 BACKGROUND

Growth typically is the result of numerous factors that affect the location, size, direction, timing, type, and rate of population increase and does not necessarily result from a single project or factor. Such factors include local government planning, availability of public services; natural resources, the economic climate, and political and environmental concerns. Local planning agencies adopt and administer general and specific plans, zoning maps and ordinances, and other planning documents that contain policies and maps to identify the intensity and type of development allowed in specific locations.

Although local governments play a major role in growth management, the location and timing of growth also depends on economic factors such as the availability and cost of developable land, regional and national economic cycles, and mortgage interest rates and the demand for new housing. Political factors that affect growth include state and local laws that mandate businesses to comply with certain rules and regulations, permitting requirements that address environmental and community concerns, and tax incentives designed to attract businesses.

Quality of life issues are also important factors influencing the timing and location of population growth. These include: the incidence of crime; air quality; traffic congestion; and the availability, cost, and quality of community services such as schools, transportation facilities, recreational facilities, and fire and law enforcement services.

7.3 IMPACTS

Development of a new transmission project is often in response to an increase in demand. Therefore, electric utility infrastructure does not induce growth, but rather follows it and is necessary to accommodate both existing and forecast load demand. Since the 1990 Census, the Southern California population has grown from approximately 14.6 million to 16.5 million[1]. This change in population represents an increase of 12.8 percent. During this period of high population growth, no new high-voltage transmission lines have been constructed in SCE's service territory.

As discussed in Section 1.0 of this PEA, one of the purposes of the Proposed Project is to interconnect and deliver energy from planned solar energy projects (owned by independent power producers) to SCE's load centers. While the Proposed Project improves the overall system capability to adequately serve the existing and forecasted load demand, it is not intended to supply power related to potential growth for any one particular development.

Therefore, the proposed expansion and upgrade of SCE's transmission system associated with the Proposed Project would result in no growth-inducing impacts.

[1] http://www.scag.ca.gov/census/

8.0 UNAVOIDABLE IMPACTS

SECTION 8.0
UNAVOIDABLE SIGNIFICANT ENVIRONMENTAL IMPACTS

8.1 INTRODUCTION

The CEQA Guidelines require identification of unavoidable significant environmental impacts that would be caused by a proposed project. The analysis for this PEA determined that potentially significant impacts could occur as a result of implementation of the Proposed Project for the following resource areas: Biological Resources, Cultural and Paleontological Resources, and Geology, Soils, and Mineral Resources. However, with implementation of the APMs and proposed mitigation measures, the resulting level of significance for all potential impacts is less than significant.

8.2 POTENTIALLY SIGNIFICANT IMPACTS

As discussed in Section 4.0 of this PEA, the Proposed Project has been determined to have potential impacts on environmental resources. APMs are proposed by SCE as part of project design and have been incorporated into the Proposed Project's design and construction plans to minimize the Proposed Project's potential impacts during the construction and operation phases. APMs are presented within each resource assessment, as applicable. Additionally, mitigation measures are proposed as a way of avoiding, minimizing, or mitigating potentially significant impacts that may result from implementation of the Proposed Project.

Below is a discussion of each potentially significant impact that was determined during the environmental analysis and what proposed measures would be used to reduce the impact to less than significant.

8.2.1 Biological Resources

The Project could have potentially significant impacts on species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or USFWS. However, with implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-7, APM BIO-8, APM BIO-9, APM BIO-10, and BIO MIT-1, impacts would be reduced to less than significant.

The Project could interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. However, with implementation of APM BIO-1, APM BIO-5, and BIO MIT-2, impacts would be reduced to less than significant. Refer to Section 4.4.4 for additional information.

8.2.2 Cultural and Paleontological Resources

The segment of the Boulder Dam 115kV transmission line (36-10315) covered by the proposed route would be impacted by the Proposed Project. This portion of the line has been deemed to contribute to the Southern Sierras Power Company Boulder Line Historic District. If the Project is constructed, the Boulder Dam 115kV line, which is eligible for the National Register of Historic Places, will require treatment measures to mitigate the loss of the segment of transmission line within the project area of potential effect to a level that is less than significant. Historic American Engineering Record Level II documentation is considered by the Applicant as the appropriate treatment for segments of the line that will be affected by the Proposed Project. However, with implementation of APM CR-2, APM CR-3a, APM CR-3b, APM CR-4a, and APM CR-4b, impacts would be reduced to less than significant. Refer to Section 4.5.4 for additional information.

8.2.3 Geology, Mineral Resources, and Soils

The Project could be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project and potentially result in a landslide, lateral spreading, subsidence, liquefaction or collapse. However, with implementation of APM GEO-1 and MM GEO-1, impacts would be reduced to less than significant. Refer to Section 4.6.4 for additional information.

SECTION 9.0
IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The CEQA Guidelines (Section 15126.2[c]) require identification of significant irreversible and irretrievable environmental changes that would be caused by a proposed project. These changes include, for example, uses of nonrenewable resources during construction and operation, changes that may occur as a result of providing long-term access to previously inaccessible areas, and irreversible damages that may result from project-related accidents.

The construction phase of the Proposed Project would require an irretrievable commitment of natural resources from direct consumption of fossil fuels and the manufacture of new equipment and supplies that generally cannot be recycled. Commitment of these resources would not substantially deplete existing supplies. Project materials, however, are expected to be largely recyclable at the end of the Proposed Project's useful lifetime.

The Proposed Project would result in the commitment of approximately 40 acres of land, most of which would be occupied by a new substation, structure footings, and access and spur roads. This commitment would be long-term, although not necessarily irreversible, as Project components could be demolished and land restored, altered, or converted for other uses by future generations.

The Proposed Project would result in permanent loss of small acreages of sensitive vegetation communities, and small numbers of some sensitive plant and animal species as noted in Section 4.5 (Biological Resources). Permanent loss of habitat may result from permanent project features (e.g., new transmission towers and substation) that would remain throughout the life of the Project. Construction of the transmission line would require direct disturbance of almost 448 acres of land, of which 408 acres would be restored after construction. The ratio of native habitat to previously disturbed habitat would vary within each transmission line segment. Within these habitats, construction activities would result in potential impacts on listed and special-status plant species shown in Tables 4-10 and 4-11 and special-status wildlife shown in Tables 4-10 and 4-11. With implementation of APMs BIO-1 through BIO-9 as recommended in Table 4-1, and Mitigation Measures BIO MIT-1 through BIO MIT-4 (see Section 4.4.5), permanent loss of biological resources would be confined to small areas at each structure location and impacts would be less than significant. That is, the Proposed Project would not result in significant irretrievable and irreversible commitments of sensitive biological resources.

Construction activities associated with the Proposed Project could result in damage or destruction of up to nine archaeological and historical sites Although implementation of APMs is expected to result in avoidance of most if not all of these sites, any direct impacts that would occur would represent an irretrievable and irreversible commitment of a nonrenewable resource. Similarly, the Proposed Project may disturb or destroy paleontological resources. Implementation of APMs would avoid and reduce potentially significant impacts to cultural and paleontological resources to less-than-significant levels.

As described in Section 4.6, Geology and Soils, the Proposed Project would result in soil erosion in disturbed areas and could destabilize steep slopes and result in landslides that could be irreversible, although implementation of APMs would be expected to reduce such impacts to less-than-significant levels.

Section 4.8, Hydrology and Water Quality, indicates that surface water and groundwater quality could be impacted through the accidental release of hazardous materials at pole or tower installation locations, staging areas, substation sites, and other locations where Project activities would occur. With the implementation of APMs, however, permanent impacts to these resources would be less than significant.

10.0 ENVIRONMENTAL JUSTICE

SECTION 10.0
ENVIRONMENTAL JUSTICE

10.1 INTRODUCTION

As directed in Executive Order 12898, signed by President Clinton in 1994, environmental justice is concerned with the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of negative environmental consequences resulting from industrial, municipal, and commercial operations. The objective of environmental justice analysis is to identify minority and low-income populations potentially affected by the Project in order to determine whether the Proposed Project would result in a potentially disproportionate impact to these populations. The Proposed Project transmission line traverses approximately 35 miles of land under the jurisdiction of BLM. Because the BLM is a federal agency with discretionary approval authority for this Proposed Project, the National Environmental Policy Act (NEPA) of 1969 is applicable to the Project. This environmental justice analysis is presented to support preparation of the forthcoming Environmental Assessment or Environmental Impact Statement.

This section contains a description of the demographic and economic characteristics found in the Proposed Project area, and the level of impact the Proposed Project would potentially have on any low-income or minority populations or American Indian tribes.

Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Environmental justice will be achieved when everyone enjoys the same degree of protection from environmental and health hazards, and equal access to the decision-making process to have a healthy environment in which to live, learn, and work. Table 10-1, Population Demographics, contains current statistics regarding Clark County and San Bernardino County population.

TABLE 10-1
POPULATION DEMOGRAPHICS

Total Population	Clark County, Nevada	San Bernardino County, California
Gender:		
Male	50.8%	50.1%
Female	49.2%	49.9%
Race:		
White (a)	78.5%	80.5%
Black (a)	10.2%	9.4%
American Indian and Alaska Native (a)	0.9%	1.4%
Asian (a)	7.1%	5.9%
Native Hawaiian and Other Pacific Islander (a)	0.5%	0.4%
Persons reporting two or more races	2.8%	2.4%
Hispanic or Latino (b)	27.2%	46.0%
White persons not Hispanic	53.2%	37.2%
Disability:		
Persons with a disability, age 5+	264,470	302,693

TABLE 10-1 POPULATION DEMOGRAPHICS		
Total Population	**Clark County, Nevada**	**San Bernardino County, California**
Income:		
Households	512,253	528,594
Persons per household	2.65	3.15
Median household income	$45,793	$43,179
Per capita money income	$21,785	$16,856
Persons below poverty	11.6%	15.4%
(a) Includes persons reporting only one race. (b) Hispanics may be of any race, so also are included in applicable race categories.		
Source: U.S. Census Bureau State & County QuickFacts Last Revised 25-July-2008		

The Eldorado-Ivanpah Proposed Project would not create health hazards to Native American, minority, or low-income communities. Due to the nature of the Proposed Project, it would not divide any communities.

No disproportionately high or adverse environmental impacts on Native American or minority or low-income communities in surrounding areas are anticipated to occur from the construction or operation of the Proposed Project.

11.0 PREPAPERS

SECTION 11.0
LIST OF PREPARERS

11.1 PEA INFORMATION CONTACT

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11.2 PEA PREPARERS

The key contributors for the preparation of the PEA for the Eldorado-Ivanpah Project, including their company affiliation, project role, and education are presented in Table 11-1.

TABLE 11-1
KEY CONTRIBUTORS FOR PREPARATION OF ELDORADO-IVANPAH PEA

Company/Affiliation	Name	Education	Contribution/Responsibility
SCE	Charles Adamson	Over 25 years experience in Electrical Utility industry generation transmission and distribution project design, construction and operation	Project Manager
SCE	Jorge Chacon	B.S. Electrical Engineering, Cal-State Polytechnic, Pomona	Transmission System Planner
SCE	Brent Gokbudak	J.D. Southwestern University; M.S. Engineering, Loyola Marymount University; B.S. Civil Engineering, University of Illinois	Case Manager
SCE	Lamar Cunningham	University of Phoenix MBA - Technology Management California State University, Long Beach, BS - Industrial Technology – Electronics	Project Engineer
SCE	John Mousel	B.S. Electrical Engineering, California State Polytechnic University, Pomona M.S. Mechanical Engineering, California State Polytechnic University, Pomona	Project Engineer

TABLE 11-1 KEY CONTRIBUTORS FOR PREPARATION OF ELDORADO-IVANPAH PEA			
Company/Affiliation	**Name**	**Education**	**Contribution/Responsibility**
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SCE	Robert Benton	Over 30 years work experience in Civil and Architectural Engineering	Civil Engineer
SCE	Ramon Calero	Loyola Marymount University, Bachelor of Science in Civil Engineering	Civil Engineer-Road Story
SCE	Osbaldo Romero	B.S. Electrical Engineering, University of California, Los Angeles	Transmission Engineer
SCE	Keith Sifling	20 years work experience in the utility business including one year in subtransmission planning.	Subtransmission Engineer
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SCE	Roy Rojas	Nearly 30 years work experience in distribution, transmission and telecommunications	IT Carrier Solutions
SCE	Koral Ahmet	B.A. Ancient History and Archaeology, University of Manchester, U.K.; M.A. Archaeology, University of Manchester, U.K.	Paleontological/Cultural Resources
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TABLE 11-1 KEY CONTRIBUTORS FOR PREPARATION OF ELDORADO-IVANPAH PEA			
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SCE	Steven K. Alford	B.S. Organizational Management, University of La Verne	Transmission Construction
SCE	Jeffrey Miller	Over 13 years work experience in Construction and Construction Management	Transmission Construction
SCE	Terry Haas	19 years of work experience in substation construction	Ivanpah Substation Construction
SCE	Robert Dowser	14 years of work experience in substation construction	Eldorado Substation Construction
SCE	Liza Fernandez-Smith	Bachelor of Arts, Political Science, UCLA Master of Business Administration, Keller Graduate School of Management Master of Project Management, Keller Graduate School of Management	Corporate Real Estate
SCE	Messeret Yilma	San Jose State University BS Business Management and Administration; University of Pittsburgh, School of Law, Juris Doctorate	Corporate Real Estate
SCE	Gary Talbott	Supervisor of GIS Survey & Mapping, Corporate Real Estate 20 years of GIS Survey & Mapping expertise	CRE Mapping
SCE	John Le	GIS Technical Specialist 5 years of GIS Mapping expertise	CRE Mapping – GIS Specialist

TABLE 11-1 KEY CONTRIBUTORS FOR PREPARATION OF ELDORADO-IVANPAH PEA			
Company/Affiliation	**Name**	**Education**	**Contribution/Responsibility**
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SCE	Robert Steins	B.S. Public Administration, California State University, Sacramento M.A. Public Administration, California State University, Sacramento	Public Involvement
SCE	Phillip Hung	B.S. Electrical Engineering, California State Polytechnic University, Pomona	
SCE	Mary Reid	Twenty years experience in Electrical Utility industry generation and transmission project construction	Project Analyst
Environmental Planning Group (EPG)	Mickey Siegel	MCRP, City and Regional Planning, Illinois Institute of Technology; BA, University of California, Los Angeles	Project Manager
EPG	E. Linwood Smith	Ph.D. Zoology, University of Arizona. More than 35 years experience throughout the western United States.	Biological Resources Manager
EPG	Robert Pape	B.A. Biology, North Central College	Biological Resources
EPG	Amy Corathers	M.P.A., Arizona State University; B.S. Aeronautical Management Technology, Arizona State University	Hazards and Hazardous Materials
EPG	Daniela Jara	B.S. Urban Planning, Arizona State University	Agriculture, Land Use and Planning, Population and Housing, Public Services, Recreation, Transportation and Traffic, Utilities and Services, Cumulative Impacts
EPG	Jeff Barber	B.S. Applied Geography, Northern Arizona University	GIS/Mapping

TABLE 11-1 KEY CONTRIBUTORS FOR PREPARATION OF ELDORADO-IVANPAH PEA			
Company/Affiliation	**Name**	**Education**	**Contribution/Responsibility**
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EPG	Kristie James		Word Processing, Document Production
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12.0 GLOSSARY

SECTION 12.0
GLOSSARY/ACRONYMS

12.1 GLOSSARY OF TERMS

Alternating current. An electric current that reverses direction in a circuit at regular intervals.

Ambient. Of the surrounding area; surrounding on all sides.

Ambient noise level. The sound pressure level at a given location normally specified as a reference level to study a new intrusive sound source.

Ampere. A unit of electric current in the meter-kilogram-second system.

Baseflow. Groundwater seepage into a stream channel.

Baseline. A set of existing conditions against which change is to be described and measured.

Bundled conductor. A number of conductors in parallel. Bundled conductors are used to increase the amount of current that may be carried in a line.

Circuit. An electrical device that provides a path for electrical current to flow.

Conductor. A substance or medium (wire) that conducts an electrical charge.

Current. The amount of electric charge flowing past a specified circuit point per unit time.

Decibel. A unit used to express relative difference in power or intensity, usually between two acoustic or electric signals. The A-weighted decibel scale (dBA) represents the relative insensitivity of the human ear to low-pitched sounds; decibels are logarithmic units that compare the wide range of sound intensives to which the human ear is sensitive.

Dielectric. A material such as glass or porcelain with negligible electrical or thermal conductivity. A dielectric is an electrical insulator that is highly resistant to flow of electrical current.

Direct current. An electrical current flowing in one direction only.

Ephemeral stream. A stream or reach of a channel that flows only in direct response to precipitation in the immediate locality and is at all times above the saturation zone.

Hertz. A unit of frequency equal to one cycle per second.

Hydrologic cycle. The hydrologic cycle refers to the continuous exchange of water between atmosphere, land, surface and subsurface waters, and organisms.

Insulator. A material such as glass or porcelain with negligible electrical or thermal conductivity.

Kilohertz. A unit of alternating current or electromagnetic wave frequency equal to one thousand hertz (1,000 Hz).

Kilovolt (kV). A unit of electromotive force equal to 1,000 volts.

Kilowatt. A unit of power equal to 1,000 watts.

Megawatt (MW). A unit of power equal to one million watts.

Polyethylene. A lightweight thermoplastic.

Polymer. Insulating material used on hardware assemblies to protect against electrical flashovers typically between bare conductor and tower steel.

Remedial Action Scheme. A protection system or plan of action, which automatically initiates one or more remedial actions to ensure transmission system reliability. Also called Special Protection System.

Right-of-way. The strip of land over which facilities, such as power lines, are built.

Riparian. Area along the banks of a river or lake supporting specialized plant and animal species.

Saturation zone. Area of ground with ground water: the zone below the water table that is saturated with ground water.

Seismicity. The relative frequency and distribution of earthquakes.

Special Protection Scheme (SPS). A protection system, or plan of action, which automatically initiates one or more remedial actions to ensure transmission system reliability. Also called Remedial Action Scheme (RAS).

Static Peak. Point on the tower (usually uppermost) used to connect the overhead groundwire for lightning protection.

Substation. A subsidiary station of an electricity generation, transmission, and distribution system where voltage is transformed from high to low or the reverse using transformers.

Watershed. Area of land within which all waterways drain to one specified outlet, or body of water such as a river, lake, ocean, or wetland. Watersheds are separated topographically by areas of elevation, such as ridges, hills, or mountains.

12.2 LIST OF ACRONYMS

2B	two-conductor bundled
3D	three-dimensional
A	amperes (unit of electrical current)
AADT	annual average daily traffic
AAQS	ambient air quality standards
AB32	Assembly Bill 32
AC	alternating current
ACEC	area of critical environmental concern
ACHP	Advisory Council on Historic Preservation
ACI	American Concrete Institute
ACSR	aluminum conductor steel reinforced
ADSS	all dielectric self supporting
ADT	average daily traffic
AHM	acutely hazardous material
AISC	American Institute of Steel Construction
ALUMOWELD	aluminum clad steel wire
AMNH	American Museum of Natural History
ANF	Angeles National Forest
ANSI	American National Standards Institute
APCD	air pollution control district
APE	area of potential effect
APEFZ	Alquist-Priolo Earthquake Fault Zone
API	American Petroleum Institute
APLIC	Avian Power Line Interaction Committee
APM	Applicant Proposed Measures
AQAP	Air Quality Attainment Plan.
AQMD	Air Quality Management District
AQMP	Air Quality Management Plan
AQRV	air quality related values
ARB	Air Resources Board
ARPC	Arizona Rare Plant Committee
ASCE	American Society of Civil Engineers
ASI	Archaeological Sensitivity Index
ASL	above sea level; see also msl (also asl)
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing Materials
AWS	American Welding Society
AZGFD	Arizona Game and Fish Department
BACMs	Best Available Control Measures
BCA	Bureau of Corrective Actions
BCI	Bat Conservation International
BCMPs	Best Construction Management Practices
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BMP	Best Management Practices

BMRR	Bureau of Mining Regulation and Reclamation
BPA	Bonneville Power Administration
BVUSD	Baker Valley Unified School District
BPC	Bureau of Water Pollution Control
CAA	Clean Air Act (Federal)
CAAA	Clean Air Act Amendment
CAAQS	California Ambient Air Quality Standards
CAISO	California Independent System Operator
CalARP	California Accidental Release Prevention (Program)
CalEMA	California Emergency Management Agency
CalEPA	California Environmental Protection Agency
CalOSHA	California Occupational Safety and Health Administration
CalTrans	California Department of Transportation
CAR	Center for Archaeological Research
CARB	California Air Resources Board
CBC	California Building Code
CCAA	California Clean Air Act
CCBCC	Clark County Board of County Commissioners
CCR	California Code of Regulations
CCDOA	Clark County Department of Aviation
CDC	California Department of Conservation
CDCA	California Desert Conservation Area
CDFA	California Department of Food and Agriculture
CDFG	California Department of Fish and Game
CDHS	California Department of Health and Services
CDMG	California Division of Mines and Geology
CDOC	California Department of Conservation
CDOG	California Division of Oil and Gas
CDWR	California Department of Water Resources
CEC	California Energy Commission
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act ("Superfund")
CERES	California Environmental Resources Evaluation System
CESA	California Endangered Species Act
cfm	cubic feet per minute
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGS	California Geological Survey
CGTL	compressed gas Insulated transmission lines
CH_4	methane
CHP	California Highway Patrol
CHRIS	California Historical Resources Information System
CHSC	California Health and Safety Code
CHU	Critical Habitat Units
CIC	construction inspection contractor
CIPC	California Invasive Plant Council

CITES	Convention on International Trade in Endangered Species
CIWMA	California Integrated Waste Management Act
CIWMB	California Integrated Waste Management Board
CLP	cross link poly cable
CMA	Congestion Management Agency
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2Eq	carbon dioxide emission rate
CPCN	Certificate of Public Convenience and Necessity
CPUC	California Public Utilities Commission
CRHR	California Register of Historic Resources
CSC	California Species of Special Concern
CSUF	California State University, Fullerton
CUPA	California Unified Program Agency
CVC	California Vehicle Code
CWA	Clean Water Act
CWC	California Water Code
DAQEM	Department of Air Quality and Environmental Management
dB	decibels
dBA	decibels 'A' scale
DC	direct current
DDT	dichlorodiphenyltrichloroethane
DEHS	Division of Health Services
DNL	daytime-nighttime noise levels
DOGGR	California Division of Oil, Gas, and Geothermal Resources
DOSH	Division of Occupational Safety and Health
DOT	Department of Transportation
DPR	Department of Parks and Recreation
DTSC	Department of Toxic Substances Control
DWMA	Desert Wildlife Management Area
DWR	Department of Water Resources
EA	Environmental assessment
EAC	Early Action Compact
EDD	State of California Employment Development Department
EEI	Edison Electric Institute
EERI	Earthquake Engineering Research Institute
EFZ	earthquake fault zones
EHV	electric high-voltage
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EIR/S	Environmental Impact Report/Statement
EMF	electric and magnetic fields
EMRU	Eastern Mojave Recovery Unit
EPA	U.S. Environmental Protection Agency

EPR	ethylene propylene rubber used for cable insulation
EPRI	Electric Power Research Institute
ERM	Emission Reduction Measures
ESA	Environmental Site Assessment
ESU	evolutionarily significant unit
°F	Fahrenheit
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FIRMs	Flood Insurance Rate Maps
FLM	Federal Land Manager
FLMPA	Federal Land Management and Policy Act
FMMP	Farmland Mapping and Monitoring Program
FPPA	Farmland Protection Policy Act
FRP	Facility Response Plan
FTA	Federal Transit Authority
g	gravitational acceleration
GEP	good engineering practice
GHG	Greenhouse Gas
GIS	geographic information system
GO	General Order (CPUC)
gpd	gallons per day
gpm	gallons per minute
gps	gallons per second
GPS	global position system
HA	Hydrologic Area
HAER	Historic American Engineering Record
HCP	Habitat Conservation Plan
HMBP	Hazardous Materials Business Plan
HMRR	Hazardous Management and Resource Restoration
HMMP	Hazardous Materials Management Plan
HMTA	Hazardous Materials Transportation Act
HOV	high occupancy vehicle
hp	horsepower
HPFF	high-pressure fluid filled
HR	hydrologic region
HSA	hydrologic sub-area
HU	hydrologic unit
Hz	hertz
I-15	Interstate 15
IBC	International Building Code
IEEE	Institute of Electrical and Electronic Engineers
IIPP	Injury and Illness Prevention Program

IMACS	Intermountain Antiquities Computer System
IPCEA	Insulated Power Cable Engineers Association
IPP	Independent Power Producers
ISEGS	Ivanpah Solar Electric Generating System
IT	information technology
IWMC	Interagency Watershed Mapping Committee
kcmil	1,000 circular mils (unit of area that describes the size of the conductor to be used)
kHz	kilohertz (unit of frequency)
KOP	Key Observation Point
kV	kilovolts (unit of electrical potential)
kVA	kilovolt amperes
KVA	key viewing area
kV/m	kilovolts per meter
kW	kilowatt
LACDPW	Los Angeles County Department of Public Works
LACFD	Los Angeles County Fire Department
LACMTA	Los Angeles County Metropolitan Transportation Authority
LACSD	Los Angeles County Sanitation District
LADWP	Los Angeles Department of Water and Power
Ldn	day-night level (of noise)
Leq	equivalent level (of noise)
Lmax	maximum level (of noise)
LMP	Land Management Plan
LORS	laws, ordinances, regulations, and standards
LOS	level of service
LST	lattice steel tower
LUFT	leaking underground fuel tank
LUST	leaking underground storage tanks
LW	lightwave
LWS	light-weight steel
LWSP	light-weight steel pole
M_b	body wave (seismic, magnitude)
M_L	Richter Scale magnitude (seismicity)
mA	milliamperes (unit of electric current)
MBTA	Migratory Bird Treaty Act
MCE	maximum considered earthquake
MCL	maximum containment level
MDAB	Mojave Desert Air Basin
MDAQMD	Mojave Desert Air Quality Management District
MEER	Mechanical Electrical Equipment Room
mG	milligauss (unit of magnetic field strength)
MGD	million gallons/per day
mg/L	milligram per liter
M_L	Richter Scale
MLD	most likely descendant

M_{max}	maximum magnitude earthquake
MMWS	Mojave mixed woody scrub
MOS	Method of Service
MOU	Memorandum of Understanding
MP	milepost
MPO	Metropolitan Planning Organization
MRZ	Mineral Resource Zone
Ms	surface wave (seismic, magnitude)
MSHCP	Multiple Species Habitat Conservation Plan
MSDS	Material Safety Data Sheet
MSWLF	Municipal Solid Waste Landfill
MTA	Metropolitan Transit Authority
MVA	megavolt ampere
MVAR	megavolt-amps reactive
Mw	moment magnitude
MW	megawatt
N_2	nitrogen gas
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAC	Nevada Administration Code
NAD	North American Datum
NAGPRA	Native American Graves Protection and Repatriation Act
NAHC	Native American Heritage Commission
NAWS	Naval Air Weapons Station
NBMG	Nevada Bureau of Mines and Geology
NCCP	Natural Communities Conservation Plan
NCIC	North Central Information Center
NDEM	Nevada Division of Emergency Management
NDEP	Nevada Department of Environmental Protection
NDOA	Nevada Department of Agriculture
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife
NEC	National Electric Code
NEMO	Northern and Eastern Mojave
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Council
NESC	National Electric Safety Code
NHP	Nevada Highway Patrol
NHPA	National Historic Preservation Act
NILS	National Integrated Land System
NNHP	Nevada Natural Heritage Program
NOI	Notice of Intent
NO_2	nitrogen dioxide
NO_X	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NPS	National Park Service

NRCS	Natural Resources Conservation Service (formerly Soil Conservation Service, [SCS])
NRHP	National Register of Historic Places
NRS	Nevada Revised Statutes
NSL	Nevada State Legislature
NVC	Nevada Vehicle Code
NVCRIS	Nevada Cultural Resources
NWP	Nationwide Permit System
O_3	ozone
OES	Office of Emergency Services
OFNR	Optical Fiber Nonconducting Riser
OHGW	overhead ground wire
OHP	Office of Historic Preservation
OHS	Office of Homeland Security
OHV	off-highway vehicle
OHW	ordinary high water
OPGW	optical ground wire
OPR	Office of Planning and Research
ORV	off-road recreational vehicle
OSHA	Occupational Safety and Health Administration
PA	Plan Amendment
Pb	lead
PCT	Pacific Crest Trail
PEA	Proponent's Environmental Assessment
PFTC	Potential Fossil Yield Classification
PERP	portable equipment registration program
PGA	peak ground acceleration
pH	potential of hydrogen, or hydrogen ion concentration
$PM_{2.5}$	fine particulate matter less than 2.5 microns in diameter
PM_{10}	respirable particulate matter less than 10 microns in diameter
ppb	parts per billion
ppm	parts per million
PPP	polypropylene – paper
PRC	Public Resources Code
PRMP	Paleontological Resource Management Plan
Proposed Project	Proposed Eldorado-Ivanpah Transmission Project
PSD	Prevention of Significant Deterioration
PSHA	Probabilistic Seismic Hazards Assessment
psi	pounds per square inch
psig	pounds per square inch gage
PUCN	Public Utilities Commission of Nevada
Qal	quaternary alluvium
RAS	Remedial Action Scheme
RCRA	Resource Conservation and Recovery Act.
RCS	Remote Control Switch

RHNA	Regional Housing Needs Assessment
RMP	Resource Management Plan
ROG	reactive organic gas
RPLI	Regional Paleontologic Locality Inventory
RPS	Renewables Portfolio Standard
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alternation Agreement
SARA	Superfund Amendments and Reauthorization Act
SAC	stranded aluminum conductor
SANBAG	San Bernardino Associated Governments
SBCM	San Bernardino County Museum
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCADA	Supervisory Control and Data Acquisition
SCAQMD	South Coast Air Quality Management District
SCCRA	Southern California Regional Rail Authority
SCE	Southern California Edison Company
SCEC	Southern California Earthquake Center
SCFF	self-contained fluid-filled
SCS	Soil Conservation Service
SEA	significant ecological area
SEL	sound exposure level
SEOC	State Emergency Operations Center
SF_6	sulfur hexafluoride
SFS	Stateline Fault System
SHMP	Seismic Hazards Mapping Program
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SLIC	spills, leaks, investigations, and cleanups
SLR	single lens reflex
SMARA	California Surface Mining and Reclamation Act of 1975
SMGB	State Mining and Geology Board
SNSA	Southern Nevada Supplemental Airport
SO_2	sulfur dioxide
SO_X	oxide of sulfur
SPCC	spill prevention, control, and countermeasures
SP, LA&SL	San Pedro, Los Angeles and Salt Lake
SPCC	Spill Prevention, Countermeasure, and Control
SR	State Route
SRMA	Special Recreation Management Area
SCADA	Supervisory Control and Data Acquisition
SVC	static volt ampere reactive compensator
SVP	Society of Vertebrate Paleontologists
SWP	State Water Project
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board

TAC	toxic air containment
TBD	to be determined
TDS	total dissolved solids
T/L	transmission line
TMA	Transportation Management Area
TMDL	total maximum daily load
TVI	television interference
TRTP	Tehachapi Renewable Transmission Project
TSDF	treatment, storage, and disposal facility
TSP	tubular steel pole
TWRA	Tehachapi Wind Resource Area
UBC	Uniform Building Code
UCMP	University of California Museum of Paleontology
UEPA	Utility Environmental Protection Act
UFC	Uniform Fire Code
UMC	Uniform Mechanical Code
UPC	Uniform Plumbing Code
UPRR	Union Pacific Railroad
USACE	Corps of Engineers, U.S. Army
USC	United States Code
USCS	Unified Soil Classification System
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
UWCD	United Water Conservation District
V/m	volt per meter
VAC	volts AC (alternating current)
VAR	volt-amperes reactive
VDC	volts DC (direct current)
VM	visual modification (Class)
VOC	volatile organic compounds
VRM	Visual Resource Management
WAN	wide area network
WBWG	Western Bat Working Group
WEAP	Worker Environmental Awareness Program
WECC	Western Electric Coordinating Council
WMP	West Mojave Plan
WSCC	Western Systems Coordinating Council
WUS	Waters of the United States
XLPE	solid dielectric cross-linked polyethylene